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5.0 Introduction

This chapter of the ES has been prepared by SLR Consulting Limited (SLR) and provides an Ecological Impact Assessment (EclA) in respect of the proposed development of an Anaerobic Digester (AD) plant (the 'Proposed Development') at a location north of Ashton Keynes in North Wiltshire and hereafter termed the 'Site'.

The EclA describes the ecological baseline of the Site and evaluates its importance. It then assesses the possible range and potential significance of impacts upon these resources, and details the appropriate avoidance, mitigation or compensation measures which are required. Following this, any residual impacts are identified, and their significance assessed. Finally, proposals for ecological enhancement are provided.

A Biodiversity Net Gain exercise has been undertaken in respect of the Proposed Development, which found that the project is likely to deliver an increase in the habitat biodiversity value of the site by 19% (area habitats), and a 102% increase in the biodiversity value of hedgerows. The full Biodiversity Net Gain report is located at Appendix 2.

This chapter of the ES should be read in conjunction with the chapters which consider noise, air quality and hydrology.

5.1 Evidence of Technical Competence and Experience

The chapter has been written by Giselle Hynes, Senior Field Ecologist at SLR and Olivia Guindon, Senior Ecologist at SLR. The chapter has been reviewed by Andy Law BSc CEcol CEnv MCIEEM, a Principal Ecologist at SLR who has over 32 years' experience as a professional ecologist.

The habitat survey and breeding bird surveys were undertaken by Giselle Hynes, who was also assisted by Emma Smith and Sarah Fletcher for bat surveys.

Giselle Hynes, a Senior Ecologist at SLR, holds an MSc in Wildlife Management and Conservation. She is a qualified member of the Chartered Institute of Ecology and Environmental Management (CIEEM). Giselle has been a consultant ecologist for more than four years and has prepared reports for a range of different projects and plans.

Emma Smith, who undertook the bat surveys, is a Senior Field Ecologist at SLR. Emma is experienced in a range of survey techniques, including protected species surveys including badger, great crested newt, bats, dormouse, water vole and reptiles. Emma has a BSc (Hons) degree in Geography from the University of Plymouth.

Sarah Fletcher, who also undertook the bat surveys, has a BSc and MSc in Applied Wildlife Conservation, and is an Assistant Ecologist with SLR. Sarah Fletcher has approximately two years' experience as a professional ecologist, undertaking protected species survey, including badgers, bats, and great crested newts.

5.2 Relevant Legislation and Policy

National Planning Policy Framework

The National Planning Policy Framework (NPPF) 2023 sets out guidance for local planning authorities and decisionmakers in how to apply planning policies when drawing up plans and making decisions about planning applications. Along with Government Circular 06/052, the broad policy objectives in relation to the protection of biodiversity and geological conservation in England through the planning system are set out. Specific policies relating to habitats and biodiversity are set out in paragraphs 174 and 179-182 of the NPPF.

Paragraph 131 states that: *"Trees make an important contribution to the character and quality of urban environments and can also help mitigate and adapt to climate change. Planning policies and decisions should ensure that new streets are tree-lined, that opportunities are taken to incorporate trees elsewhere in*

developments (such as parks and community orchards), that appropriate measures are in place to secure the long-term maintenance of newly planted trees, and that existing trees are retained wherever possible. Applicants and local planning authorities should work with highways officers and tree officers to ensure that the right trees are planted in the right places, and solutions are found that are compatible with highways standards and the needs of different users.”

Paragraph 174 states that: “Planning policies and decisions should contribute to and enhance the natural and local environment by:

- a) *protecting and enhancing valued landscapes, sites of biodiversity or geological value and soils (in a manner commensurate with their statutory status or identified quality in the development plan);*
- b) *recognising the intrinsic character and beauty of the countryside, and the wider benefits from natural capital and ecosystem services – including the economic and other benefits of the best and most versatile agricultural land, and of trees and woodland;*
- c) *maintaining the character of the undeveloped coast, while improving public access to it where appropriate;*
- d) *minimising impacts on and providing net gains for biodiversity, including by establishing coherent ecological networks that are more resilient to current and future pressures;*
- e) *preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of soil, air, water or noise pollution or land instability. Development should, wherever possible, help to improve local environmental conditions such as air and water quality, taking into account relevant information such as river basin management plans; and*
- f) *remediating and mitigating despoiled, degraded, derelict, contaminated and unstable land, where appropriate”.*

Paragraph 179 states that: “To protect and enhance biodiversity and geodiversity, plans should:

- a) *Identify, map and safeguard components of local wildlife-rich habitats and wider ecological networks, including the hierarchy of international, national and locally designated sites of importance for biodiversity; wildlife corridors and stepping stones that connect them; and areas identified by national and local partnerships for habitat management, enhancement, restoration or creation; and*
- b) *promote the conservation, restoration and enhancement of priority habitats, ecological networks and the protection and recovery of priority species; and identify and pursue opportunities for securing measurable net gains for biodiversity.”*

Paragraph 180 of the NPPF states that: “When determining planning applications, local planning authorities should apply the following principles:

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

- d) *development whose primary objective is to conserve or enhance biodiversity should be supported; while opportunities to improve biodiversity in and around developments should be integrated as part of their design, especially where this can secure measurable net gains for biodiversity or enhance public access to nature where this is appropriate.”*

Paragraphs 181-182 relate to European sites (referred to as habitats sites) and state: *“The following should be given the same protection as habitats sites:*

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

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

Planning Practice Guidance

National Planning Policy Guidance (NPPG)¹ is an online source of planning advice first published by government in March 2014 and subject to frequent updates and revision. Of particular relevance to the ecology chapter is advice appertaining to:

- Climate change;
- Natural Environment;
- and water supply, wastewater and water quality.

Adopted Local Plans

Wiltshire Core Strategy 2015

Core Policy 50, Biodiversity and Geodiversity states that *“Development proposals must demonstrate how they protect features of nature conservation and geological value as part of the design rationale. There is an expectation that such features shall be retained, buffered, and managed favourably in order to maintain their ecological value, connectivity, and functionality in the long-term.*

Where it has been demonstrated that such features cannot be retained, removal or damage shall only be acceptable in circumstances where the anticipated ecological impacts have been mitigated as far as possible and appropriate compensatory measures can be secured to ensure no net loss of the local biodiversity resource and secure the integrity of local ecological networks and provision of ecosystem service”.

The policy goes on to confirm that *“All development should seek opportunities to enhance biodiversity. Major development in particular must include measures to deliver biodiversity gains through opportunities to restore, enhance and create valuable habitats, ecological networks and ecosystem services. Such enhancement measures will contribute to the objectives and targets of the Biodiversity Action Plan (BAP) or River Basin/ Catchment Management Plan, particularly through landscape scale projects, and be relevant to the local landscape character”.*

The Biodiversity Net Gain assessment indicates that the project is likely to deliver an increase in the habitat biodiversity value of the site of up to 19% and in the linear habitat (hedgerow) an increase in biodiversity value

¹ <https://www.gov.uk/government/collections/planning-practice-guidance> (accessed 11/4/22)

of the site of up to 102%. By demonstrating a level of enhancement at or greater than a 1% change the proposed development, in line with recent caselaw, is considered to satisfy the current requirement for biodiversity enhancement under the National Planning Policy Framework. The level of net gain also satisfies the future ambition of 10% BNG set out within the Environment Act.

Core Policy 54 Cotswold Water Park relates to proposals for outdoor or water-based sport and leisure and recreation activities. Whilst the proposed AD facility would not fall within this description of development, the landscaping scheme and biodiversity net gain (BNG) would contribute towards enhancement of biodiversity within the Water Park and the job creation during construction and operation would contribute to the local economy.

North Wiltshire Local Plan 2011 Saved Policies

NE12 Woodland

The creation, conservation, enhancement and positive management of woodlands across the district will be supported. In particular, areas of ancient and semi-natural woodland should be protected. The retention of the visual amenity and nature conservation value will be sought in particular at the following:

- i) *Bird's Marsh Wood, Chippenham*
- ii) *Vincient's Wood, Chippenham*
- iii) *Pockeredge Drive Wood, Corsham*
- iv) *Woodland within Braydon Forest.*

6.32 Woodlands are a very important element within the landscape of the district. They enhance urban areas and edges and the wider countryside. They have landscape, visual and nature conservation value, are often historic features and can be used for recreation. Ancient and semi-natural woodlands are particularly important and are protected. Circular 9/95 (General Development Order Consolidation) should be referred to in this regard. The multi-purpose use of forestry and woodland is supported and should be carried out in accordance with the English Forestry Strategy and UK Forestry Standard.

6.33 Bird's Marsh Wood, Vincient's Wood and Pockeredge Drive Wood have been specifically identified in the Local Plan in view of their importance to the landscape setting of their respective towns, where they are not covered by other landscape designations. Bird's Marsh Wood is a large wood of approximately 24 hectares, which is valuable for its flora and its refuge for wildlife. Vincient's Wood, under the control of the Wiltshire Wildlife Trust, forms a significant landscape feature, the protection of which is further needed due to its being surrounded by housing and the Western Bypass. The woodland at Pockeredge Drive forms part of a wider wooded landscape in the historic Box Tunnel Valley area. Braydon Forest is a larger area covering a number of SSSI's. The Braydon Forest Project is run by the Wiltshire Wildlife Trust with the aim of conserving and enhancing the distinctive landscape of the old Braydon Forest comprising pasture and coppice woodland.

Assessment Methodology

Scope

An assessment of likely impacts of the Proposed Development on biodiversity resources has been undertaken in line with the relevant professional guidance. This includes specific consideration of ecological sites, habitats, and species.

The ecological evaluation and impact assessment approach used in this chapter aligns with the CIEEM Guidelines for Ecological Impact Assessment in the United Kingdom and Ireland² ("CIEEM guidelines"), which are widely regarded as good practice for professional ecologists.

The approach advocated in the CIEEM guidelines has been supplemented with that set out in Highways England (2020)³, which is referred to from this point onwards as LA 108. LA 108 provides further description or characterisation of resource importance, the level of impact (change) and levels of significance that broadly align with the CIEEM approach.

The approach to the ecological assessment has been undertaken as follows:

- definition of the existing ecological conditions of the Proposed Development area, including a review of the development area in its local and regional ecological context;
- determination of the existing ecological value of the Proposed Development area and surrounding areas;
- identification and description of all potentially significant ecological effects associated with the Proposed Development;
- outlining the design, mitigation and compensation measures required to ensure compliance with nature conservation legislation and to address any potentially significant ecological effects;
- identification of how mitigation and compensation measures will be delivered;
- identification of any residual ecological effects following mitigation, and an assessment of their significance.
- identification of appropriate enhancement measures and how these will be delivered; and
- outlining the requirements for post-completion monitoring.

The Site was subject to baseline ecology surveys, with the Site and a 2km buffer being used for the desk-based search area.

Data Sources

Desktop studies and field surveys have been completed at the Site by SLR Consulting in 2022. The following reports, as detailed in Table 5-1, have subsequently been used to inform this assessment and all ecology reports are included as technical appendices:

² CIEEM (2018) Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine version 1.2. Chartered Institute of Ecology and Environmental Management, Winchester

³ Highways England (2020). Design Manual for Roads & Bridges. LA 108 Biodiversity.

Table 5-1
Details of Ecological Studies and Surveys

Report	Author	Dates undertaken	Methodology	Ecology Technical Appendix Section
Sites				
Ecological Data	Gloucestershire Centre for Environmental Records and Wiltshire and Swindon Biological Records Centre	October 2022	Records within a 2km radius of the Site boundary	Within the EcIA baseline section and individual species reports
Habitats				
Biodiversity Net Gain assessment (BNG)	SLR	February 2023	Defra Metric Version 3.1	Appendix 2
Species				
Birds	SLR	November 2022 – July 2023 inclusive	Wintering and Breeding Bird Survey	Appendix 3
Bats	SLR	July 2023 – August 2023 inclusive	Preliminary Bat Roost Assessment and Emergence Re-entry Surveys	Appendix 4

Assessment Approach

Determining the Importance of Ecological Features ('receptors')

Ecological features can be important for a variety of reasons and the rationale used to identify them is explained below. Importance may relate, for example, to protected status, the quality or extent of the site or habitats therein; habitat and/ or species rarity; the extent to which such habitats and/ or species are threatened throughout their range, or to their rate of decline.

Important habitats are considered here to be those which:

- match descriptions of habitats listed on Annex 1 of the Habitats Directive, so far as it applies to the UK and as transposed by The Conservation of Habitats and Species Regulations 2017 (as amended);
- match descriptions of Habitats of Principal Importance as outlined under Section 41 of the Natural Environment and Rural Communities (NERC) Act 2006;
- match descriptions of habitat selection criteria for Local Wildlife Sites in Wiltshire;
- comprise irreplaceable habitats; such as (but not limited to) ancient woodland and veteran trees; and/ or
- comprise a significant habitat resource for an important species (see below).

Important species are considered here to be those:

- of European conservation importance (as listed on Annexes II, IV and V of the Habitats Directive or Annex 1 of the Birds Directive) so far as it applies to the UK and as transposed by The Conservation of Habitats and Species Regulations 2017 (as amended);
- specially protected under the terms of the Wildlife and Countryside Act 1981 (as amended);
- of principal importance for biodiversity as outlined under Section 41 of the Natural Environment and Rural Communities (NERC) Act 2006;
- match descriptions of species selection criteria for Local Wildlife Sites in Wiltshire;
- Red listed or listed as near threatened using International Union for the Conservation of Nature (IUCN) criteria (IUCN, 2012; IUCN, 2016; IUCN 2019), e.g. in one of the UK Species Status Project reviews, or, where a more recent assessment of the taxonomic group has not yet been undertaken, listed in a Red Data Book);
- for birds, a potentially important population of a species which is red or amber listed in the UK (Eaton *et al.*, 2015⁴ and Stanbury *et al.*, 2021⁵);

⁴ Eaton MA, Aebischer NJ, Brown AF, Hearn RD, Lock L, Musgrove AJ, Noble DG, Stroud DA and Gregory RD (2015) *Birds of Conservation Concern 4: the population status of birds in the United Kingdom, Channel Islands and Isle of Man*. British Birds 108, 708–746. Available online at britishbirds.co.uk/wp-content/uploads/2014/07/BoCC4.pdf

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. Available online at <https://britishbirds.co.uk/content/status-our-bird-populations>.

- which are listed as a Nationally Rare or Nationally Scarce species (e.g. in one of the Species Status Project reviews) or listed as a nationally notable species where a more recent assessment of the taxonomic group has not yet been undertaken; and/ or
- endemic to a country or geographic location (it is appropriate to recognise endemic sub-species, phenotypes, or cultural behaviours of a population that are unique to a particular place).

The importance of an ecological feature is considered within a defined geographical context. The CIEEM guidelines set out the following frame of reference which can be applied to identified ecological features which are informed by desk study and surveys:

- International and European;
- National;
- Regional;
- Metropolitan, County, vice county or other local authority-wide area; and
- Local.

For the purposes of this assessment only ecological features of local importance or greater and/ or subject to legal protection are subject to detailed assessment (and are referred to as “important ecological features”). Effects on other ecological features of lower importance are considered unlikely to be significant in legal or policy terms so are not subject to detailed assessment.

Characterising Impact

When describing impacts, reference has been made to the following characteristics, as appropriate:

- Beneficial, adverse or negligible;
- Extent;
- Magnitude;
- Duration (short term <5 years, mid-term 5-10 years, long term >10 years);
- Timing;
- Frequency; and
- Reversibility.

The impact assessment process considers both direct and indirect impacts: direct ecological impacts are changes that are directly attributable to a defined action, e.g. the physical loss of habitat occupied by a species during the construction process. Indirect ecological impacts are attributable to an action, but which affect ecological resources through effects on an intermediary ecosystem, process or feature, e.g. the interruption of water courses which cause hydrological changes, which, in the absence of mitigation, could lead to the drying out of downstream habitats.

Significant Effects

The concept of ecological significance is addressed in paragraphs 5.24 through to 5.28 of the CIEEM guidelines. Significance is a concept related to the weight that should be attached to effects when decisions are made. For the purpose of an ES Chapter, a ‘significant effect’ is an effect that either supports or undermines biodiversity conservation objectives for ‘important ecological features’ or for biodiversity in general. Conservation objectives may be specific (e.g. for a designated site) or broad (e.g. national/local nature conservation policy) or more wide-ranging (enhancement of biodiversity). Effects can be considered significant at a wide range of scales from

international to local and the scale of significance of an effect may or may not be the same as the geographic context in which the feature is considered important.

Paragraphs 5.29 – 5.34 of the CIEEM guidelines cover how significant effects are determined. To summarise:

- for designated sites – effects may be significant if they are likely to undermine the conservation objectives of the site; or positively or negatively affect the conservation status of species or habitats for which the site is designated; or may have affect the condition of the site or its interest/qualifying features.
- for ecosystems – effects may be significant if the project is likely to result in a change in ecosystem structure and function. Consideration should be given as to whether any processes or key characteristics will be removed or changed, if there will be an effect on the nature, extent, structure and function of component habitats or if there is an effect on the average population size and viability of component species.
- for habitats and species - consideration of conservation status is important for evaluating the effects of impacts on individual habitats and species and assessing their significance. Conservation status is defined as follows:
 - Habitats – conservation status is determined by the sum of the influences acting on the habitat that may affect its extent, structure and functions as well as its distribution and its typical species within a given geographical area.
 - Species – conservation status is determined by the sum of influences acting on the species concerned that may affect its abundance and distribution within a given geographical area.

Cumulative Impacts

Cumulative effects can result from individually insignificant but collectively significant actions taking place over a period of time or concentrated in a location. Cumulative effects can occur where a Proposed Development results in individually insignificant impacts that, when considered in-combination with impacts of other proposed or permitted plans and projects, can result in significant effects.

Avoidance, Mitigation, Compensation and Enhancement

The purpose of avoidance, impact minimisation and compensation measures are to reduce the extent or magnitude of project impacts. The aim of these measures is to reduce the project's adverse impacts such that there is no overall loss of biodiversity as a result of the project. Following CIEEM guidelines, the terminology has been defined as below:

- Avoidance: where an impact has been eradicated through, e.g. changes in project design.
- Mitigation: measures used to reduce or remedy a specific negative impact in situ.
- Compensation: when mitigation in situ is impossible, then compensation is used to offset residual effects.
- Enhancement: provision of new benefits for biodiversity that are additional to those provided as part of mitigation or compensation measures.

When seeking mitigation or compensation solutions, the CIEEM guidelines state that efforts should be consistent with the geographical scale at which an effect is significant. For example, mitigation and compensation for effects on a species population significant at a county scale should ensure no net loss of the population at a county scale. The relative geographical scale at which the effect is significant will have a bearing on the required outcome which must be achieved.

Where potentially significant effects have been identified, the mitigation hierarchy has been applied, as recommended in the CIEEM guidelines. The mitigation hierarchy sets out a sequential approach beginning with the avoidance of impacts where possible, the application of mitigation measures to minimise unavoidable impacts and then compensation for any remaining impacts. Once avoidance and mitigation measures have been applied residual effects are then identified along with any necessary compensation measures, and incorporation of opportunities for enhancement.

Residual Impacts

After assessing the impacts of the proposal, all attempts should be made to avoid and mitigate ecological impacts as described above. Once measures to avoid and mitigate ecological impacts have been finalised, assessment of the residual impacts should be undertaken to determine the significance of their effects on ecological features.

As outlined in the CIEEM guidelines, any residual impacts that will result in effects that are significant, alongside the proposed compensatory measures, will be the factors considered against ecological objectives (legislation and policy) in determining the outcome of the application.

Significance Criteria

Project-specific importance criteria have been developed through reference to both the CIEEM guidelines and LA 108 and these are included in Table 5-2, which outlines how biodiversity resource importance has been assessed.

Table 5-2
Biodiversity resource importance adapted from CIEEM (2018) and Highways England (2020)

Resource Importance	
International or European Importance	
Sites	Sites including: 1) European sites: a) Sites of Community Importance (SCIs); b) Special Protection Areas (SPAs); c) potential SPAs (pSPAs); d) Special Areas of Conservation (SACs); e) Candidate or possible SACs (cSACs or pSACs); f) Wetlands of International Importance (Ramsar sites). 2) Biogenetic Reserves, World Heritage Sites (where recognised specifically for their biodiversity value) and Biosphere Reserves. 3) Areas which meet the published selection criteria for those sites listed above but which are not themselves designated as such.
Habitats	N/A
Species	Resident, or regularly occurring, populations of species which can be considered at an international or European level where: 1) the loss of these populations would adversely affect the conservation status or distribution of the species at an international or European scale; or 2) the population forms a critical part of a wider population at this scale; or 3) the species is at a critical phase of its life cycle at an international or European scale.

UK or national importance	
Sites	Sites including: 1) Sites of Special Scientific Interest (SSSIs); 2) National Nature Reserves (NNRs); 3) National Parks; or 4) Areas which meet the published selection criteria for those sites listed above but which are not themselves designated as such.
Habitats	Habitats including: 1) areas of UK BAP priority habitats; 2) habitats included in the relevant statutory list of priority species and habitats; and 3) areas of irreplaceable habitats including: a) ancient woodland; b) ancient or veteran trees; c) blanket bog; d) limestone pavement; e) sand dunes; f) salt marsh; and g) lowland fen. 4) areas of habitat which meet the definition for habitats listed above but which are not themselves designated or listed as such.
Species	Resident, or regularly occurring, populations of species which can be considered at an international, European, UK or national level where: 1) the loss of these populations would adversely affect the conservation status or distribution of the species at a UK or national scale; or 2) the population forms a critical part of a wider population at this scale; or 3) the species is at a critical phase of its life cycle at a UK or national scale.
Regional importance (i.e. south-west England)	
Sites	Designated sites (non-statutory).
Habitats	Areas of habitats identified (including for restoration) in regional plans or strategies (where applicable).
Species	Species including: 1) resident, or regularly occurring, populations of species which can be considered at an international, European, UK or national level where: a) the loss of these populations would adversely affect the conservation status or distribution of the species at a regional scale; or b) the population forms a critical part of a wider regional population; or c) the species is at a critical phase of its life cycle. 2) Species identified in regional plans or strategies.
County or equivalent authority importance (i.e. Wiltshire)	
Sites	Wildlife/nature conservation sites designated at a county (or equivalent) level including: 1) Local Wildlife Sites (LWS); 2) Local Nature Conservation Sites (LNCS); 3) Local Nature Reserves (LNRs);

	4) Sites of Importance for Nature Conservation (SINCs); 5) Sites of Nature Conservation Importance (SNICIs); and 6) County Wildlife Sites (CWSs).
Habitats	Areas of habitats identified in county or equivalent authority plans or strategies (where applicable).
Species	Species including: 1) resident, or regularly occurring, populations of species which can be considered at an international, European, UK or national level where: a) the loss of these populations would adversely affect the conservation status or distribution of the species at a county or unitary authority scale; or b) the population forms a critical part of a wider county or equivalent authority area population, e.g. metapopulations; or c) the species is at a critical phase of its life cycle. 2) Species identified in a county or equivalent authority area plans or strategies.
Local importance (within circa 5km)	
Sites	Wildlife / nature conservation sites designated at a local level including: 1) Sites of Local Nature Conservation Importance (SLNICIs).
Habitats	Areas of habitat considered to appreciably enrich the habitat resource within the local context including features of importance for migration, dispersal, or genetic exchange.
Species	Populations/communities of species considered to appreciably enrich the species resource within the local context including features of importance for migration, dispersal or genetic exchange.

Project-specific level of impact (change) criteria have been developed through reference to both the CIEEM guidelines and LA 108 and these are included in Table 5-3. These provide further refinement and understanding of the change that the Proposed Development will lead to in biodiversity resources.

Table 5-3
Level of Impact from CIEEM (2018) and Highways England (2020)

Level of impact (change)		Description
Major	Adverse	1) Permanent/irreversible damage to a biodiversity resource; and 2) The extent, magnitude, frequency, and/or timing of an impact negatively affects the integrity or key characteristics of the resource.
	Beneficial	1) Permanent addition of, improvement to, or restoration of a biodiversity resource; and 2) The extent, magnitude, frequency, and/or timing of an impact positively affects the integrity or key characteristics of the resource.
Moderate	Adverse	1) Temporary/reversible damage to a biodiversity resource; and 2) The extent, magnitude, frequency, and/or timing of an impact negatively affects the integrity or key characteristics of the resource.
	Beneficial	1) Temporary addition of, improvement to, or restoration of a biodiversity resource; and

		2) The extent, magnitude, frequency, and/or timing of an impact positively affects the integrity or key characteristics of the resource.
Minor	Adverse	1) Permanent/irreversible damage to a biodiversity resource; and 2) The extent, magnitude, frequency, and/or timing of an impact does not affect the integrity or key characteristics of the resource.
	Beneficial	1) Permanent addition of, improvement to, or restoration of a biodiversity resource; and 2) The extent, magnitude, frequency, and/or timing of an impact does not affect the integrity or key characteristics of the resource.
Negligible	Adverse	1) Temporary/reversible damage to a biodiversity resource; and 2) The extent, magnitude, frequency, and/or timing of an impact does not negatively affect the integrity or key characteristics of the resource.
	Beneficial	1) Temporary addition of, improvement to, or restoration of a biodiversity resource; and 2) The extent, magnitude, frequency, and/or timing of an impact does not affect the integrity or key characteristics of the resource.
No change	No observable impact, either positive or negative.	

A project-specific significance matrix has been developed through reference to LA 108 and adopting terminology that is consistent with the wider Environmental Statement. The matrix is included in **Error! Reference source not found.** This relates the importance of a resource to the level of change that the Proposed Development will lead to, to support the determination of the significance of effect.

For consistency with the reporting in the wider Environmental Statement the following terminology changes from LA 108 have been adopted:

- 'slight' significance of effect – reported as 'minor'
- 'moderate' significance of effect – no change; and
- 'large' significance of effect – reported as 'Major'.

Table 5-4
Significance Matrix adapted from Highways England (2020)

LEVEL OF (MAGNITUDE)	IMPACT	RESOURCE IMPORTANCE (SENSITIVITY)				
		International or European	UK national	Regional	County or equivalent authority	Local
Major		Major	Major	Moderate or major	Minor or moderate	Minor
Moderate		Major	Moderate or major	Moderate	Minor	Neutral or minor
Minor		Moderate or major	Minor or moderate	Minor	Neutral or minor	Neutral or minor
Negligible		Minor	Minor	Neutral or minor	Neutral or minor	Neutral

Where Table 5-4 includes two significance categories, evidence is provided to support the reporting of a single significance category.

Uncertainties and limitations

Details on any limitations encountered in the surveys are also provided in the respective reports. The limitations are minor and unlikely to impact the conclusions drawn from the baseline survey data.

Baseline Conditions

Following the completion of the initial habitat survey in September 2022, breeding and wintering bird surveys have been undertaken which finished in July 2023. A full suite of presence/absence bat surveys were also undertaken in July-August 2023 of an ash tree adjacent to the Site's entrance which needs to be removed due to ash dieback disease.

Landscape context

The Site falls within the administrative boundary of Wiltshire Council and is located on Ashton Road, approximately 1.1km south-west of South Cerney and 2km north of Ashton Keynes, at NGR SU 03993 96195. It extends for approximately 7.00 hectares (ha) and comprises most of a square-shaped field and the northern quarter of a second adjoining field to the south. The topography of the Site generally slopes from west to east, from approximately 102m aOD in the north-west to 92m at the south-east boundary.

The Site sits within an agricultural landscape of fields from which sand and gravel has previously been extracted leaving a high concentration of man-made lakes. In total, some 170 lakes are present, which are mostly used for leisure and conservation purposes, and which collectively form the large Cotswold Water Park, a Site of Special Scientific Interest (SSSI) for its birds and wetland habitats. The nearest SSSI lakes/water bodies to the Site are situated approximately 0.65km to the south-east and 0.7km to the west respectively.

The land east of the Site beyond Ashton Road is a closed landfill and has been restored to sheep pasture. The closed landfill access gates remain, as do low mounds and bunds and some former structures (a large metal tank). A derelict barn with livestock holding pens is present in the adjacent field to the north-west of the site at a distance of c.150m. This barn is to be retained during the proposed works and screened by retained hedgerow.

The River Thames flows 2km south of the Site in a west-east alignment, subsidiaries of the Thames flow around the Site eventually joining the main river at different intervals in the south/ southeast.

A Public Right of Way runs along the Site's western boundary in a north-south alignment connecting the Old Farmhouse/ Cotswold Community to South Cerney via Ashton Road.

Baseline

Statutory Designated Sites - International

A 15km radius from the Site, has been used to identify those statutory designated sites of European or greater importance that have the potential to require assessment under the Habitats Regulations.

One Site, North Meadow and Clattinger Farm, a Special Area of Conservation (SAC), is present c. 3km to the south-west.

Statutory Designated Sites – National

A 2km radius from the Site has been used to identify the presence of statutory designated sites of national importance with an ecological interest.

The Cotswold Water Park SSSI is present within this 2km distance. This is a large SSSI (1919ha). SSSI units occur to the west (0.60km), the south (0.58km) and south-east (0.62km) of the Site. The SSSI is of national importance for breeding and non-breeding birds and populations of aquatic plants.

Part of the above SSSI is also designated as Coke's Pit Lake Local Nature Reserve (LNR) which is located 1.25km from the Site to the south-west.

The Site is located within the impact risk zone of Cotswold Water Park SSSI and as such Natural England will be formally consulted. The Proposed Development falls into the “all planning applications”, combustion and waste categories (General combustion processes >50 MW energy input. Incl: energy from waste incineration, other incineration, landfill gas generation plant, pyrolysis/gasification, anaerobic digestion, sewage treatment works, other incineration/ combustion.).

Table 5-5
Statutory Designated Sites of relevance to the Proposed Development

Site Name	Distance (m) and Direction from site	Site Description
Statutory Sites		
Cotswold Water Park SSSI – National importance	58m south nearest but also present to the west and south-east	A former gravel workings comprising the UK’s largest marl lake system. The site is of special interest due to the nationally important species it supports, comprising a diverse assemblage of breeding birds of lowland open waters, their margins and scrub. Bird species include great crested grebe <i>Podiceps cristatus</i> , little egret <i>Egretta garzetta</i> , lapwing <i>Vanellus vanellus</i> , yellowhammer <i>Emberiza citronella</i> , reed bunting <i>Emberiza schoeniclus</i> , linnet <i>Linaria cannabina</i> , and yellow wagtail <i>Motacilla flava</i> . The site also supports notable aquatic plants such as stoneworts.
Coke’s Pit Lake LNR - National importance	1,250 south-west	An area of open water with shingle islands, reedswamp, grassland and hedgerows. Wetland plant species include stoneworts, whilst faunal species include water vole <i>Arvicola amphibious</i> , tufted duck <i>Aythya fuligula</i> , common tern <i>Sterna hirundo</i> , reed bunting <i>Emberiza schoeniclus</i> , Daubenton’s bat <i>Myotis daubentonii</i> and various dragonflies and damselflies.
North Meadow and Clattinger Farm SSSI and SAC – European importance	3,027 south-west	Located in the Thames Valley, North Meadow and Clattinger Farm is one of two sites representing lowland hay meadows near the centre of its UK range. The site represents a traditional pattern of management and so exhibits conservation of structure and function. This site also contains more than 90% of the surviving UK population of snake’s head fritillary <i>Fritillaria meleagris</i> , a species highly characteristic of damp lowland meadows.

Non-Statutory Designated Sites – County

The Site is also situated within a 2km radius of fourteen Local Wildlife Sites (LWS), details of which are provided in Table 5-6.

Table 5-6
Non-statutory designated Sites within 2km of the Site

Site Name	Distance (m) from Site	Site Description
Cotswold Water Park Pit 62 Local Wildlife Site	290 south	A small private lake in the Cotswold Water Park.
Cotswold Water Park Pit 26 Local Wildlife Site	535 south-east	A large lake in a former gravel pit with associated aquatic marginal, grassland, wetland, woodland and scrub habitats, used mainly for recreational sailing.
Cotswold Water Park Lakes 84 and 85 Shorncote Reedbed Local Wildlife Site	662 north-west	A series of lakes, gravel pits and reservoirs with reedbed and bird assemblages. The site also contains connecting habitats of rough grassland with deep ditches. The reedbeds support a diverse bird assemblage including reed bunting <i>Emberiza schoeniclus</i> , reed warbler <i>Acrocephalus scirpaceus</i> , little grebe <i>Tachybaptus ruficollis</i> , snipe <i>Gallinago gallinago</i> , otter <i>Lutra lutra</i> , water vole <i>Arvicola amphibius</i> and bittern <i>Botaurus stellaris</i> . The site is also important for various species of dragonfly.
Cotswold Water Park Pit 27 Local Wildlife Site	705 south-east	A lake in the Cotswold Water Park, mainly used for angling.
Cotswold Water Park Pits 28, 28a, 29, 30, 35, 38 Local Wildlife Site	775 south	A complex of restored lakes resulting from gravel extraction with willow fringes and surrounded by areas of ruderal and more established grassland.
Cotswold Water Park Pit 32 Local Wildlife Site	1,020 south-west	The southern half of a lake which forms the Keynes Country Park, used for recreation.
River Churn Local Wildlife Site	1,230 north-east	The River Churn Local Wildlife Site is designated for its mammal interest.
Clayhill Field Local Wildlife Site	1,230 south-east	A small wet meadow in the centre of Cotswold Water Park, with areas of rush-pasture vegetation.
Cotswold Water Park Pit 37 Local Wildlife Site	1,270 south-west	A lake in the Cotswold Water Park, mainly used for recreation.
Cotswold Water Park Pit 96 Local Wildlife Site	1,520 south-east	A small, secluded willow <i>Salix</i> sp. fringed lake within Cotswold Water Park.
Cotswold Water Park Pits 39, 40, 64, 70, 92, 93, 94 Local Wildlife Site	1,770 south	A large group of lakes, quarries and grassland with some bird interest.
Cotswold Water Park Pits 25, 66, 69, 76 & 200 Local Wildlife Site	1,780 south-east	A large, restored site with a number of large and small lakes resulting from gravel extraction and two large species-poor neutral meadows.

Ancient Woodland and Priority Habitats (MAGIC)

Reference to the MAGIC dataset confirmed that no ancient woodlands⁶ are present within 2km of the Site.

In respect of UK Priority Habitat Types numerous areas of coastal and floodplain grazing marsh, lowland meadow, traditional orchards and deciduous woodland are shown on MAGIC within 2km of the Site. The closest Priority Habitat is an area of deciduous woodland, located 250m east of the Site boundary. Information on the above Priority Habitats is provided in Table 5-7 below. Due to the extent of habitats, only those within 500m of the Site boundary are shown.

Table 5-7
Priority Habitat within search radius

Site Name	Distance (m) from Site	Size (ha)
Deciduous woodland	250m east	1.03
Deciduous woodland	295m south	0.88
Traditional orchard	360m south-west	0.04
Deciduous woodland	398m east	1.13
Coastal and Floodplain Grazing Marsh	415m north-west	26.37
Traditional orchard	454m south-west	0.16

Habitats

A habitat survey of the Site was undertaken in September 2022, using the UKHab survey methodology. The results of the UKHab Survey are illustrated in map form in Drawing 1 at the end of this report and are described below. The Site has been mapped using the fine scale minimum mapping unit MMU (25m², 5m length), in accordance with the UK Habitat Classification User Manual⁷.

Habitats are sub-divided into broad types and are described in detail in the following sections. An assessment is then made of each habitat's value based on its local ecological context (e.g., matching LBAP or LWS selection criteria descriptions) as well as its rarity or distinctiveness (e.g., classification as Habitats of Principal Importance under Section 41 of the NERC Act 2006).

A summary of the importance of these habitats is provided in Table 5-.

c1c Cereal crops

The majority of the Site comprised two fields usually growing wheat, but which were ploughed at time of survey and comprising bare ground (see Figure 1). These were bounded by hedgerows and had narrow grassy margins. The species in these margins included predominantly perennial rye *Lolium perenne* and false oat-grass *Arrhenatherum elatius* with occasional nettle *Urtica dioica* and red fescue *Festuca rubra*.

⁶ Ancient Woodland is not a formal designation as such, but is a term applied to sites in England and Wales whose documented history shows them to have been continuously wooded since approximately 1600, and which are by extension considered likely to have been continuously wooded since the last Ice Age. Ancient Woodland sites and their mature soils are considerably more complex and biodiverse ecosystems than secondarily wooded sites, and therefore represent environmental capital that should be considered to be a finite resource, as it is not renewable in a human timescale.

⁷ The UK Habitat Classification Working Group (September 2020) *The UK Habitat Classification User Manual Version 1.1*.

Figure 1 – Arable field, recently ploughed



h2a Hedgerows; priority habitat

The fields were bounded by native hedgerows. Further detail is provided below in Table 5-8 regarding species and features associated with each section of hedgerow within the Site. The locations of each section of hedgerow are detailed in Drawing 1.

Table 5-8
Details of hedgerows on site

Hedgerow reference	Description
H1	A predominantly hawthorn <i>Crataegus monogyna</i> hedgerow located along the western boundary of the Site. The hedgerow had large gaps in both the base and the hedge canopy and other species included ivy <i>Hedera helix</i> , bramble <i>Rubus fruticosus</i> and ash trees <i>Fraxinus excelsior</i> .
H2	A predominantly hawthorn and blackthorn <i>Prunus spinosa</i> hedgerow, located along the northern Site boundary. The hedgerow had large gaps in both the base and the hedge canopy and other species included ash trees, bramble and dog rose <i>Rosa canina</i> .
H3	A predominantly blackthorn hedge, associated with a dry ditch and located along the roadside along the eastern boundary of the site. Additional species included hawthorn, bramble, dogwood <i>Cornus sanguinea</i> , dog rose and field maple <i>Acer campestre</i> . The understorey comprised predominantly ivy.
H4	The centre of the site was bisected by a hedgerow with trees, associated with a ditch, which was dry at time of survey. The hedgerow had large gaps in both the base and in the hedge canopy and comprised predominantly hawthorn. Other species present included crab apple <i>Malus sylvestris</i> , bramble, field maple, blackthorn, dog rose and ivy. The hedgerow also contained a semi-mature ash <i>Fraxinus excelsior</i> at the western-most end.

g4 Modified grassland

A small area of modified grassland was located in the south-western corner of the Site, adjacent to a gateway (see Figure 2). Species in this area comprised common nettle, cow parsley *Anthriscus sylvestris*, hedge mustard *Sisymbrium officinale*, false oat-grass *Arrhenatherum elatius*, red dead nettle *Lamium purpureum*, cleavers *Galium aparine*, shepherd's purse *Capsella bursa-pastoris* and creeping thistle *Cirsium arvense*.

Figure 2 – Area of modified grassland located in south-western corner of the Site



r1 191 Standing open water and canals; ditch

Two ditches were located on Site, associated with hedgerows, as detailed in Table 5-8. Both ditches were dry at time of survey and dominant species present included nettle and cow parsley, with hedge mustard, false oatgrass, red dead nettle and cleavers also present (see Figure 3).

Figure 3 – Dry ditch running along the centre of the Site



Summary and Assessment of Value

A summary of the assessed importance of the Site habitats is provided in Table 5-9.

Table 5-9
Value assessment of habitats

Broad Habitat Type	Habitat	Assessment of importance
Cropland	Arable	N/A – less than local
Grassland	Improved grassland	N/A – less than local
Hedgerow	Native Hedgerow	Local
Rivers and lakes	Standing open water and canals; ditch	N/A – less than local

One Habitat of Principal Importance (HPI), listed under Section 41 (S41) of the Natural Environment and Rural Communities (NERC) Act 2006, was recorded onsite: native hedgerow.

Protected and Notable Species

Plants

GCER and WSBRC returned 112 records of notable plants within the 2km search area. This included 81 records of flowering plants and one horsetail and one stonewort species.

The Site is predominantly cropland; therefore the diversity of plant species is low and no notable plant species were recorded during the habitat survey.

No invasive plant species, as listed on Schedule 9 of the Wildlife and Countryside Act 1981 (as amended) were recorded during the UKHab survey, or were returned by the data search.

Given the arable management which takes place and the absence of semi-natural habitats it is considered unlikely that the Site would support notable plant species.

Invertebrates

GCER and WSBRC returned 51 records of notable invertebrate species within 2km of the Site, comprising of 22 species. This includes two species of beetle *Coleoptera*, eight species of moth *Lepidoptera*, six species of butterfly *Lepidoptera*, three species of dragonfly *Odonata*, two species of *Hymenoptera* and one species of mollusc. Fifteen of these records are from the past decade.

All the moth and butterfly species recorded in the desk study are listed as both UK BAP and Section 41 species. However, only two of these (grizzled skipper *Pyrus malvae*, and white-letter hairstreak *Satyrion w-album*) have records from the last decade. Grizzled skipper inhabits woodland and unimproved grassland and requires species larval foodplants such as wild strawberry, whilst white-letter hairstreak, favour hedgerows where elms *Ulmus procera* occur, and woodland. No elms, unimproved grassland or woodland habitats are present on Site.

Given the arable management which takes place and the absence of semi-natural habitats it is considered unlikely that the Site would support notable invertebrate species or assemblages.

Amphibians

GCER and WSBRC returned 29 records of notable amphibian species within 2km of the Site, comprising of four species: common toad *Bufo bufo*, palmate newt *Lissotriton helveticus*, smooth newt *Lissotriton vulgaris*, and great crested newt (GCN) *Triturus cristatus*. The closest record of GCN was 1.3km from the Site in 2013.

There are no ponds within the Site. Reference to aerial imagery revealed the presence of ten ponds within 500m of the survey area, but no ponds are present within 250m. It is generally accepted that terrestrial amphibians, including great crested newt, rarely travel over 250m from breeding ponds (Jehle, 2000⁸). In addition, the intervening habitats within the ponds and the Site comprise arable with no direct connectivity to the Site.

The hedgerows on the Site could support other amphibians such as common toad; however, the majority of the Site is arable land. Therefore, while it is possible that small numbers may use the site occasionally, it is considered unlikely that permanent populations are present. Amphibians are therefore not considered further in this report.

Reptiles

The data search returned 12 records of reptiles within the 2km search radius. This comprised two species: grass snake *Natrix Helvetica*, and common lizard *Zootoca vivipara*, both of which are listed on Schedule 5 of the Wildlife and Countryside Act 1981 and are UK BAP priority species.

Small areas of suitable habitats for reptiles are present such as hedgerow and fallen deadwood habitats, however, the Site is unlikely to support a significant population of any reptile species. Therefore, while it is possible that small numbers of common reptiles may use the Site occasionally, it is considered unlikely that permanent populations are present. Reptiles are not considered further in this report.

Birds

All birds are protected under Section 1, part 1 of the Wildlife and Countryside Act 1981 (as amended) (S41), which makes it an offence to intentionally kill, injure or take any wild bird; damage, take or destroy its nest while that nest is in use or being built; or take or destroy its eggs.

Further, the Act affords additional protection to specific species of birds listed in Schedule 1 of the Act. It is an offence intentionally or recklessly to: disturb a bird listed on Schedule 1 while it is nest building, or at a nest containing eggs or young; or disturb the dependent young of such a bird.

The conservation status of UK birds is also described using the Birds of Conservation Concern (BoCC) (Eaton *et al.*, 2015 & Stanbury *et al.*, 2021) categorisation. Red listed birds are globally threatened, with a Severe (at least 50%) contraction of UK breeding population and range over last 25 years, whereas Amber listed birds have a moderate (25-49%) population and range decline and have unfavourable conservation status in Europe. Green listed birds occur regularly in the UK and do not qualify under any red or amber list criteria.

A number of bird species are also listed as Species of Principal Importance under Section 41 of the NERC Act (2006).

The data search returned 4,975 records of notable bird species within the 2 km search radius. This comprised 127 species.

The Site is in arable use and therefore does not contain habitats of recognised high value for birds in the context of the adjacent Cotswold Water Park SSSI such as wet grassland. However, due to the relatively close proximity of the SSSI it could be used during the winter for feeding or roosting and had the potential to be used by farmland birds such as lapwing for breeding.

⁸ Jehle, R. (2000). The terrestrial summer habitat of radio-tracked great crested newts (*Triturus cristatus*) and marbled newts (*T. marmoratus*). *Herpetological Journal*, 10, pp. 137-142.

A suite of winter bird and breeding bird surveys were therefore undertaken in 2022 and 2023, the results of which can be found in Appendix 3. The survey recorded the following Birds of Conservation Concern (BoCC/S41/Sch1 species), comprising four Red List Species; lapwing, starling, skylark and linnet and nine Amber List Species; greylag goose, mallard, woodpigeon, black-headed gull, lesser black-backed gull, whitethroat, wren, song thrush and dunno. The Site is therefore considered to be of **Local importance** to breeding and winter birds.

Mammals

Commuting/ Foraging bats

GCER and WSBRC returned records of brown long-eared bat *Plecotus auratus*, common pipistrelle *Pipistrellus pipistrellus*, Daubenton's bat *Myotis daubentonii*, lesser horseshoe bat *Rhinolophus hipposideros*, Nathusius's pipistrelle *Pipistrellus nathusii*, Natterer's bat *Myotis nattereri*, noctule bat *Nyctalus lasiopterus*, serotine *Eptesicus serotinus* and soprano pipistrelle *Pipistrellus pygmaeus* within a 2km radius of the site.

The Site supports suitable habitat for commuting and foraging bats in the form of native hedgerows as boundary features. There is also nearby waterbodies, located within 100m of the Site, which would suit species such as noctule.

However, the majority of the Site comprises arable land which has negligible potential to be of importance for supporting commuting/foraging bats⁹. The Site is therefore considered likely to be of **no more than Local importance** to foraging/commuting bats.

Roosting bats

Several of the hedgerow trees (ash and oak) situated within the Site contained potential roosting features such as split limbs, rot holes, dense ivy cover, central cavities and woodpecker holes with high potential to provide opportunities for roosting bats.

It is understood that four ash trees are to be removed to facilitate the proposed development, one of which contains features suitable for roosting bats. Bat Surveys have therefore been undertaken of this tree, the results of which can be found in Appendix 4. The surveys confirmed the presence of a bat roost in a tree to be removed. This comprised a soprano pipistrelle day roost and a common pipistrelle day roost. Two common pipistrelles were observed emerging from the tree, and one soprano pipistrelle.

Badger

GCER and WSBRC returned 15 records of badger for the 2km radius around this Site. The Site offers a poor quality foraging habitat, limited to hedgerow and grassland margins.

No setts or other field evidence of badger was observed. The Site may be used by badgers on occasion, however, it is not considered to be of importance to this species. Nonetheless, due to the intervening time between surveys and construction of the proposed digestion facility, an updated precautionary badger walkover survey should be completed to ensure that no badger setts have become established in the intervening time.

Riparian Mammals: Beaver, otter and water vole

The data search returned records of beaver *Castor fiber*, otter *Lutra lutra* and water vole *Arvicola amphibus* within 2km of the Site. The record for beaver is associated with an enclosed lake at Cotswold Water Park and as such beavers are unable to disperse from this site. The Site has two ditches, associated with hedgerows, but these were dry and heavily shaded at the time of survey. Riparian mammals are therefore not considered further within this report.

⁹ [Bat Survey Guidelines 2016](#)

Hazel dormouse

The data search returned no records of hazel dormouse *Muscardinus avellanarius* within 2km of the Site.

The Site is bounded by native hedgerow albeit not species-rich. It is poorly connected to deciduous woodland in the wider countryside and Ashton Road which runs along the eastern boundary of the Site provides a major barrier for any commuting or foraging dormice. The Site is therefore given a negligible potential value for this species, which is not considered further within this report.

Other Mammals

The data search returned 30 records of hedgehog *Erinaceus europaeus* within km of the Site. The large arable portion of the Site is unlikely to support hedgehog and they will not be considered further in this report.

The projected future baseline

Without implementation of the Proposed Development, while subject to natural successional process, habitats onsite are likely to remain relatively unchanged based on their continued land-use and management. Consequently, it is anticipated that their populations would continue to remain stable onsite for the foreseeable future.

Impacts of climate change may lead to habitat change over longer timescales, (e.g. 10 years); in particular for example, ditches becoming progressively drier as well as a decline in the water table may result in this trend continuing.

Summary of Important Ecological Features

A summary of the importance of ecological features onsite is provided in Table 5-10 below. Where features are not included in the table these are valued below local importance, which in line with CIEEM guidelines, are not subject to detailed assessment. These will not be discussed further in this report.

Table 5-10
Summary of Ecological Features within Zone of Influence

Ecological Feature	Scale at which feature is important	Comments on legal status and/or importance
Sites		
Statutory designated sites	European/National	The proposed development falls into the impact risk zone for the Cotswold Water Park SSSI , designated for the nationally important species it supports, comprising a diverse assemblage of breeding birds of lowland open waters, their margins and scrub. Bird species include great crested grebe <i>Podiceps cristatus</i> , little egret <i>Egretta garzetta</i> , lapwing <i>Vanellus vanellus</i> , yellowhammer <i>Emberiza citronella</i> , reed bunting <i>Emberiza schoeniclus</i> , linnet <i>Linaria cannabina</i> , and yellow wagtail <i>Motacilla flava</i> . The site also supports notable aquatic plants such as stoneworts.
Non-statutory designated sites	County	Various non-statutory sites are located within 2km of the site, the closest of which are located within

		the Cotswold Water Park. The development could indirectly impact on the designated sites.
Habitats		
Habitats, comprising hedgerow	Local	Habitats of Principal Importance, classified under Section 41 (S41) of the Natural Environment and Rural Communities (NERC) Act 2006.
Species		
Birds – Wintering and Breeding	Local	All wild birds are protected under the Wildlife and Countryside Act 1981 (as amended). Numerous birds nesting in the wider area are also protected under Schedule 1 of the WCA 1981.
Mammals – Bats	Local (foraging and commuting and roosting)	All bat species are listed on Schedule 2 of the Conservation of Habitats and Species Regulations 2017.

Potential effects

Table 5- 11 below provides a summary of the potential effects upon ecological receptors, and the following text then assesses and identifies those impacts which are likely to be most significant based upon the assessor's knowledge of the site, the development proposals and the likely effects.

Firstly, effects of the development upon designated sites and irreplaceable habitats are assessed. Then, impacts relating to the development are assessed with regards to onsite habitats and the protected species groups brought forward for further consideration.

Embedded mitigation, or mitigation by design, has been taken into account at the initial Significant Effect assessment stage, as design mitigation is effectively a good way of implementing avoidance measures. Details of the Proposed Development are provided in Chapter 3 of this Environmental Statement.

Table 5-11
Scoping Matrix of Potential Effects

	Habitat loss	Indirect effects through fragmentation and isolation	Physical disturbance or injury	Noise, lighting and visual disturbance	Changes in air quality / dust	Alterations to surface water flow and water quality	Pollution	Traffic	Cumulative impacts
Sites									
Statutory designated sites	×	×	×	✓	✓	✓	✓	✓	✓
Non-statutory designated sites	×	×	×	✓	✓	✓	✓	✓	✓
	Habitats								
Hedgerows	✓	✓	✓	×	×	×	×	×	×
	Species								
Birds	✓	✓	✓	✓	×	×	×	×	×
Foraging and commuting bats	✓	✓	×	✓	×	×	×	×	×
Roosting bats	✓	×	✓	✓	×	×	×	×	×

Statutory designated sites

The Site is situated within the Cotswold Water Park SSSI Impact Risk Zone and the Proposed Development would fit the categories of “All Planning Applications”, “Air Pollution” and “Combustion”.

Air Quality

Potential effects to air quality are considered within the Air Quality Assessment in Chapter 4 of this Environmental Statement.

Cotswold Water Park SSSI

In summary, the results of the dispersion modelling assessment of impacts on C_{Le} 's (Critical Loads) demonstrate that the PC (Process Contribution) is below 50% of the annual C_{Le} at the SSSI, meaning that the levels of air pollution are far below the level at which significant harmful effects could occur.

Potential effects of dust emissions are also detailed in the Air Quality Assessment in Chapter Four of this Environmental Statement. In the absence of mitigation, the potential exists for dust to be generated during the initial earthworks stage and to a lesser extent during construction and trackout. The Cotswold Water Park SSSI is located within 20m of sections of the Site access points and within 500m of the Site's entrance. The sensitivity of the area with respect to dust soiling effects in relation to earthworks and construction is considered to be 'low' and trackout is considered to be 'medium'.

Other Sites

Coke's Pit Lake LNR and North Meadow and Clattinger Farm SAC are remote from the Proposed Development, however, potential effects on these statutory sites are also considered within the Air Quality Assessment in Chapter 4. The assessment found that there is an absence of likely significant effects from the Proposed Development as the PC is below 100% of the annual C_{Le} at the site, confirming that there is a very low potential for significant harmful effects.

Potential impacts related to combustion emissions from the plant are detailed in the Air Quality Impact Assessment completed by Earthcare Technical Ltd. The maximum PCs for NO_x, SO₂ and NH₃ are predicted at North Meadow and Clattinger Farm SAC. However, concentrations are not predicted to exceed the 1% threshold screening value set out in the EA/Defra AERA (2023) criteria and/or IAQM (2020) Conservation Sites guidance for the discrete locations modelled. The impact of combustion emissions are therefore regarded as not significant.

Hydrology

Cotswold Water Park SSSI

Potential impacts to the hydrology of the SSSI are detailed in the Hydrology and Hydrogeology Assessment provided as Chapter Six of this Environmental Statement. This identified various potential impacts such as through spills, an increase in impermeable surface cover, turbid runoff and the potential need for dewatering.

Noise

Cotswold Water Park SSSI

Impacts of noise are considered in the Noise Assessment Report¹⁰ for the Site. This report concluded that noise impacts reviewed for the proposed development are deemed acceptable with respect to overarching requirements for planning and noise.

¹⁰ 404.V11923.00004_Site_19_Ashton Keynes_Noise_Report_v2 (002)

Supporting Habitat

Cotswold Water Park SSSI

Cotswold Water Park SSSI is designated predominantly for breeding birds of open water and as there are no such habitats on site it is considered unlikely that large numbers of birds from the SSSI would utilise the Site. The only species recorded on Site which is associated with the SSSI comprised low numbers of foraging lapwing, both in the winter and at the end of the breeding season. The breeding and wintering bird surveys did not record the presence of important populations of individual species or an important assemblage of breeding or wintering birds in the context of the SSSI.

Due to the low numbers of foraging lapwing, mitigation has been recommended to provide compensatory habitat off-site for lapwing. This should comprise an area measuring at least 7ha, which will be managed as arable, but should be ploughed or harrowed (depending on cropping regime) and left bare in the winter to benefit foraging lapwing.

It is therefore concluded that the Proposed Development will result in **No change level of impact** to the relevant statutory designated sites.

Non-statutory designated sites

For non-statutory designated sites at a county scale (i.e., LWS), no direct effects are predicted upon any of the sites within a 2km radius of the Proposed Development boundary due to distance. However, impacts from dust, aerial deposition of pollutants, changes to hydrology, construction-related noise and cumulative impacts have been identified as having potential for adverse impacts upon those sites associated with Cotswold Water Park, the closest of which comprises Cotswold Water Park Pit 62 LWS located 290 m south from the site.

According to the Air Quality Impact Assessment completed by Earthcare Technical Ltd, at locally designated sites, the maximum PCs for long term NO_x, SO₂ and NH₃ are predicted at Cotswold Water Park Lake Pit 26. For this site there are no predicted exceedances (100%) of the lower Cle (Critical Level). In accordance with EA/Defra guidance the long-term impact of concentrations at the local conservation sites is regarded as not significant. In terms of dust pollution, mitigation measures should be followed as detailed above with regard to statutory designated sites to ensure an absence of impact upon non-statutory designated sites.

Impacts of noise are considered in the Noise Assessment Report¹¹ for the site. This report concluded that noise impacts reviewed for the proposed development are deemed acceptable with respect to overarching requirements for planning and noise.

Potential impacts of water pollution are detailed in the Hydrology and Hydrogeology report to the site, at Chapter 6 of this Environmental Statement. Embedded or inherent mitigation measures to protect the water environment have been incorporated into the design of the proposed development, as well as into construction methods. Such measures will prevent or reduce potential impacts both during construction and once the proposed development is operational. These would be managed through the implementation of a CEMP.

The potential for effects to occur on non-statutory designated sites has been assessed to result in a **No change level of impact**.

¹¹ 404.V11923.00004_Site_19_Ashton Keynes_Noise_Report_v2 (002)

Habitats

Habitats of Principal Importance – Hedgerow

Habitat loss involves the direct destruction or physical take-up of vegetation, or the removal of other habitat structures with conservation interest.

Habitat loss may also occur indirectly as a result of a change in land-use or water management, for instance the drying-up of ponds or through induced successional events leading to a change in habitat type.

Full details of the areas and proportion of habitats lost are provided within the Biodiversity Net Gain Assessment (Appendix 2).

In summary, in addition to arable farmland, a central length of hedgerow habitat (260m) would need to be removed. The removal of short sections of hedgerow in other locations will also be required to facilitate site access.

Retained habitats of Principal Importance could potentially experience in-direct effects such as artificial lighting. Such effects are discussed in more detail below and with mitigation and compensation measures advised as appropriate.

The Biodiversity Net Gain supports the conclusion that in the absence of any predicted direct loss of irreplaceable or Habitats of Principal Importance, the Proposed Development will result in a **Minor beneficial level of impact**. Further information on habitat changes that form part of the Proposed Development is presented in the Appendix 2 Biodiversity Gain Plan.

Species

Birds

During construction all birds are at risk of being negatively impacted by inappropriate vegetation removal during the breeding season, mitigation will therefore be required.

Surveys have been undertaken during the winter and breeding season to establish the importance of the Site for birds. These surveys identified that the areas of hedgerow and arable habitat have the most value to support bird assemblages of conservation concern on site, and the Proposed development will lead to the loss of this habitat and a **Major adverse level of impact**. Section 8 of this chapter sets out the proposed mitigation and compensation measures to minimise the level of impact.

Bats

Several of the trees on site contained potential roosting features. These comprised ash and oak trees with roosting features such as split limbs, rot holes, dense ivy cover, central cavities and woodpecker holes. One of these trees (an Ash Tree) is to be removed due to ash dieback. A full suite of bat surveys was therefore completed of this tree and are detailed in Appendix 4. The tree was identified as a confirmed roost for common and soprano pipistrelle bats. As such, if removal proceeds without obtaining a bat mitigation licence from Natural England, there is a chance for a **major adverse level of impact** to roosting bats. Section 8 of this chapter sets out the proposed mitigation and compensation measures to minimise the level of impact.

Indirect negative impacts that could make the confirmed roost and other potential roosts throughout the site no longer suitable could include artificial lighting illuminating the roost or the surrounding habitat, this could occur during construction temporarily or long-term during operation of the Site. Mitigation will be required to prevent detrimental illumination of bat roosts and foraging habitat.

The only habitat on site suitable to support foraging and commuting bats is the hedgerow surrounding the site and bisecting the middle of the site. The hedgerow, bar small sections to accommodate access and the central hedgerow, will be retained as part of the Proposed Development, therefore retaining the most important

habitat for bats. In addition, embedded mitigation in the form of species rich hedgerow planting, species rich grassland and native shrub planting is proposed on the site. This will have a positive impact on foraging and commuting bats.

The Proposed Development has the potential to generate a **Minor adverse level of** impact on the Site's suitability for bats, in the absence of mitigation, through reduction in suitability of parts of the site for roosting and/or foraging, associated with changes in lighting. Section 8 of this chapter sets out the proposed mitigation and compensation measures to minimise the level of impact.

Species summary

Construction related activities and movement of site personnel during construction phase of the development, as well as traffic movements post-completion, can all create visual and noise disturbance in the Site. The Proposed Development will lead to short term increases in construction related disturbance, and longer-term impacts relating to increased traffic movements on the Site.

Increased intensity of disturbance can have a range of impacts dependent upon the sensitivity of the species, the nature and duration and the timing of the disturbance. These disturbances are not anticipated to impact upon any qualifying interest features for European designated sites but may result in impacts on protected or notable species groups within the Site. Birds have been identified as being susceptible to noise and visual disturbance at Site.

8.0 Mitigation and Compensation Measures

This section outlines the mitigation measures considered appropriate to avoid, reduce, mitigate or offset any potential significant effects on the ecological resource present on and within the zone of influence of the Proposed Development.

The mitigation and enhancement strategy should be implemented by means of a Construction Environmental Management Plan and a Biodiversity Management Plan covering the pre-construction, construction and post-completion stages.

In line with current best practice and planning policy the Proposed Development has been designed adopting the Mitigation Hierarchy, which provides a structured approach to minimising impacts upon valued ecological receptors. The applicability of the hierarchy to this development are as follows:

Avoidance - Avoiding adverse effects through good design should be the primary objective of any proposal. This may be achieved, for example, through either the selection of alternative designs, alterations to Site layout, or by selecting an alternative site where no harm to biodiversity would occur.

Mitigation - Adverse effects that cannot be avoided should be adequately mitigated. Mitigation measures are put in place to minimise the negative impact of a plan or project during or after its completion. Examples of mitigation include the use of pollution interceptors on surface drainage schemes, dust suppression and the minimisation of light spill.

Compensation - The protection of biodiversity assets should be achieved through avoidance and mitigation wherever possible. Compensation, the next step in the hierarchy, is proposed for unavoidable impacts, such as habitat losses.

Enhancement - Almost all development proposals provide opportunities to enhance or create new benefits for wildlife, which should be explored alongside the application of the hierarchy of measures to resolve potential adverse effects. Examples at Horse Close Green Power include enhancing retained habitats such as hedgerows.

Mitigation in relation to dust, noise, and risks of water pollution during construction are set out in the relevant chapters of this Environmental Statement and will be delivered through a CEMP, which is to be agreed with the councils and other relevant stakeholders and consultees, post-consent. With these measures in place, it is likely that significant effects upon numerous receptors will be reduced, as detailed in the relevant sections below.

Statutory Designated Sites

It was confirmed that no likely significant effects are expected from changes in air quality or hydrology at Cotswold Water Park SSSI, Coke's Pit Lake LNR and North Meadow and Clattinger Farm SAC. Nonetheless, mitigation measures as detailed within Section 7.1.1 of the Air Quality Assessment in Chapter 4 are proposed. These comprise actions which will be taken during both the construction phase and operational phase of the proposed development. These measures will be set out in a Construction and Ecological Management Plan (CEMP). In terms of hydrology, potential environmental impacts would be managed through the implementation of appropriate mitigation measures as set out in a CEMP which would include (but are not limited to) retaining the maximum level of vegetation cover, the use of cut-off ditches, establishment and maintenance of materials storage areas, locating stockpiles away from open drainage ditches, collecting runoff, conducting activities with potential pollutants in dedicated areas and covering piles of building materials. Providing these methods are followed as outlined in a CEMP, there will be a **No Change level of impact** to statutory sites.

Non-statutory Designated Sites

Providing mitigation measures are followed as described above with regards to statutory sites, there will be a **No change level of impact** to non-statutory sites.

Habitats: Hedgerow

In total, 260m of hedgerow would be lost to facilitate the proposed development. However, significant new hedgerow, greater than the loss, will be planted on Site as shown by the proposed development plan. This comprises the planting of 0.31km of new hedgerow, as well as the retention and enhancement of existing hedgerows.

Retained hedgerows would be positively managed to increase the average height to 3m and to infill any gaps with native shrubs or hedgerow trees, and any non-native invasive plant species would be removed, as appropriate. Potential native shrubs and trees for enhancement and hedgerow infilling include blackthorn *Prunus spinosa*, hazel *Corylus avellana*, dog rose *Rosa canina*, dogwood *Cornus sanguinea*, spindle *Euonymus europaeus*, holly *Ilex aquifolium*, English oak *Quercus robur*, and field maple *Acer campestre*. This enhancement would enable the development to result in a **major beneficial level of impact**.

Birds

Prior to the development commencing, arable farming on site will stop. In the intervening time between cessation of farming and commencement of construction, the Site will be managed to ensure that ground vegetation does not develop which could be used by ground-nesting birds. This could be through regular repeat cultivation or other means undertaken outside of the nesting season.

Without mitigation, a negative long-term impact post-completion on breeding and winter birds has been predicted, due to the loss of nesting and feeding areas comprising arable farmland and the central hedgerow. To mitigate for the loss of arable habitat within the Proposed Development, management recommendations, in relation to farmland bird species of conservation concern, are given to be implemented within the surrounding arable land within the landowner's ownership. This will benefit breeding skylark and various other breeding farmland birds such as linnet and dunnock and will also benefit winter foraging birds such as lapwing and meadow pipit. This advice is detailed in the Bird Survey Report (Appendix 3) and summarised below:

- Compensatory habitat off-site for lapwing (which will also benefit black-headed gull, meadow pipit and other farmland birds). This is to comprise an area measuring 7 ha which will be managed as arable, but should be ploughed or harrowed (depending on cropping regime) and left bare in the winter to benefit foraging lapwing.
- Management of existing hedgerows, both on-site and in the offsite location, to form an "A-shape" would also increase invertebrate diversity and be beneficial for linnet, woodpigeon, wren, song thrush, dunnock, bullfinch and other farmland birds such as reed bunting and yellowhammer, to benefit nesting birds and also increase food sources for foraging birds.
- Fourteen skylark plots should be created in the off-site landholding, measuring a minimum of 16m² in area and 3m wide.
- Within the offsite area identified, wide set aside margins should be created (measuring approximately 6m), to benefit starling as well as a range of other winter and breeding bird species.

The implementation of this mitigation will be detailed fully in an Ecological Management Plan (EMP). With mitigation in place the Proposed Development will have a reduction in the level of adverse effects and an increase in the beneficial effects on nesting birds, therefore creating a **Major beneficial impact**.

Bats

Roosts

During the bat surveys, as detailed in Appendix 4, two-day roosts for soprano and common pipistrelle were identified in a tree to be removed due to ash dieback. A Natural England Licence is therefore required prior to felling the tree. Mitigation will also be required, estimated as being one maternity suitable box to replace the lost roost and a further box added for each tree lost.

Due to the loss of roosting opportunities due to the removal of Tree 1, it is recommended that a bat box is installed on site. This is in addition to any compensation bat boxes installed as part of the Bat Mitigation Licence. It is also advised that tree replacement is implemented. The tree should be replaced on a 2:1 basis. The tree should be replaced with either lime or oak trees¹². All trees should be protected from incidental deer and squirrel damage until they have become established. The type and locations of all bat boxes will be detailed in a Biodiversity Management Plan for the site.

In addition, precautionary methods of working should be adopted when removing the trees either with a confirmed roost or with roosting potential. Should these be followed, there will be a **no change level of impact**.

Foraging and Commuting

Although the central hedgerow is to be lost to facilitate the proposed development, hedgerow planting will be undertaken, increasing the amount of hedgerow present on site. In addition, existing retained hedgerows are to be enhanced, providing improved habitat for foraging and commuting bats.

A lighting plan for the Site has been produced to support continued use of foraging habitat through adoption of appropriate lighting. Post-completion, illumination will be kept to a minimum, with only the minimal lighting used for safety and security and of the lowest lumens required for the purpose. It has been designed to minimise light spill and does not increase the luminance of the hedgerow boundaries which could be used by foraging and commuting bats by more than 1 lux. The specification for lamps will comply with the latest guidance in respect of bats and lighting in the UK¹³ as follows:

- all luminaires will lack UV elements when manufactured. Metal halide, fluorescent sources will not be used;
- LED luminaires will be used where possible due to their sharp cut-off, lower intensity, good colour rendition and dimming capability;
- a warm white spectrum (ideally <2700Kelvin) will be adopted to reduce blue light component;
- luminaires will feature peak wavelengths higher than 550nm to avoid the component of light most disturbing to bats (Stone¹⁴);
- only luminaires with an upward light ratio of 0% and with good optical control will be used; and
- luminaires will always be mounted on the horizontal, i.e. no upward tilt.

Long term enhancement of the Site for bats includes the planting of species rich grassland and the creation of new hedgerow habitat surrounding the southern portion of the Site. With mitigation and enhancement in place the Proposed Development is assessed to result in a **Minor positive level of impact**.

¹² Planting of ash trees is currently not advised due to the prevalence of ash dieback.

¹³ Institute of Lighting Professionals and Bat Conservation Trust Guidance Note 08/08 *Bats and Artificial Lighting in the UK* (October 2018)

¹⁴ **Stone, E.L., Jones, G., & Harris, S. (2012) Conserving energy at a cost to biodiversity? Impacts of LED lighting on bats. *Global Change Biology*. 18 (8).**

Summary of mitigation and compensation measures

The reporting of residual effects associated with the Proposed Development takes account of mitigation and compensation measures that have been set out in this section. In order to ensure the mitigation hierarchy is appropriately adopted and delivered these measures need to be clear, specific and deliverable. To support this, and prior to construction, a CEMP and Biodiversity Management Plan will be produced. A summary of mitigation and compensation measures are provided below in Table 5-12.

Table 5-12
Summary of Mitigation and Compensation Measures

Ecological Receptor	Detail of any Impacts	Avoidance, Mitigation and compensation	Level of impact (change)*
Sites			
Statutory designated sites: Cotswold Water Park SSSI, Coke's Pit Lane LNR and North Meadow and Clattinger Farm SAC	Confirmed no likely significant effects from changes in air quality at Cotswold Water Park SSSI, Coke's Pit Lane LNR and North Meadow and Clattinger Farm SAC (<100% of C _{LJ}).	N/A – No impacts	No change
	No impacts upon the assemblage of winter and breeding birds, provided mitigation is followed as detailed in Appendix 3.	Habitat creation offsite, comprising seasonal bare ground for winter foraging, hedgerow management, skylark plots and wide set aside margins.	
	No impacts to the hydrology of the site, providing mitigation measures are followed.	To include, but not limited to vegetation retention, appropriate storage of materials, use of cut off ditches, appropriate locations for potentially polluting activities and collecting runoff	
Non-statutory designated sites (LWS's associated with Cotswold Water Park)	No likely potential for indirect effects through disturbance from construction activities.	N/A – No impacts	No change

	Confirmed no likely significant effects from changes in air quality at the LWS (<100% of C _L)		
Habitats			
Habitats: hedgerow	Loss of hedgerow within the centre of the site (-0.26km)	Retention of 0.57km of hedgerow and creation of 0.31km of new hedgerow	Major beneficial
Species			
Birds	Loss of breeding and foraging habitat.	Habitat creation both onsite and offsite, comprising onsite neutral wet grassland, offsite seasonal bare ground for winter foraging, hedgerow management onsite and offsite, skylark plots and wide set aside margins.	Major beneficial (post completion of mitigation measures)
Bats (roosts)	Loss of an ash tree supporting two common species of pipistrelle.	A mitigation licence would need to be obtained prior to removal of the tree containing a bat roost (further details in Appendix 4).	No change
Bats (foraging and commuting)	Minor loss of species-poor hedgerow. Deterioration of retained foraging habitat through lighting.	Lighting plan. A gain in hedgerow length on site and enhancement of existing hedgerows.	Minor beneficial

Residual Effects

Construction stage

The Proposed Development will generate changes in land use and the habitats and species distribution within the Site. The main changes will be those associated with the clearance or modification of baseline habitats and the direct/indirect disturbance of species that use these areas. After mitigation these changes are assessed to not result in any residual effects on sites or habitats.

Post completion stage

The proposed development will generate changes from use of the Site post completion and from changes to the traffic flows on the road network and changes in air quality.

After mitigation the Proposed Development is predicted to result in the following residual effects:

- Statutory designated sites: no change level of impact
- Non-statutory designated sites: no change level of impact
- Habitats: Hedgerow: major beneficial impact
- Birds: minor beneficial impact
- Bats: minor beneficial impact for foraging bats, no change level of impact for roosting bats.

Summary of residual effects

A summary of potential impacts, proposed mitigation, residual effects and, where relevant, proposed compensation measures is provided for each important ecological feature included in the assessment in Table 5-. Assuming the mitigation, compensation and enhancements are implemented as described, the number of residual impacts on sites, habitats and species as a result of the Proposed Development will be limited.

The avoidance, mitigation and compensation measures employed to reduce the likelihood of significant impacts on ecological receptors at the Site rely on the production of numerous reports and activities before works commence at the Site which will be conditioned:

1. Preparation of a Construction and Environmental Management Plan, to detail:
 - a. Sensitive lighting strategy during construction;
 - b. Sensitive timing of vegetation clearance avoiding the nesting bird season, or provision of a nesting bird check survey.
2. Preparation of a Biodiversity Management Plan, to detail creation and long-term management of farmland nesting bird habitat.

Table 5-13
Residual impacts after consideration of mitigation and compensation measures

Resource	Potential effect	Significance (pre-mitigation)	Mitigation measure	Means of delivering mitigation	Significance of residual effects
Construction Stage					
Cotswold Water Park SSSI	Indirect disturbance from construction works (dust, pollutants)	Importance: Local Level of impact: Minor adverse	Standard good-practice methods of working	CEMP	No change
LWS's associated with Cotswold Water Park	Indirect disturbance from construction works (dust, pollutants)	Importance: Local Level of impact: Minor adverse	Standard good-practice methods of working	CEMP	No change
Habitats: Hedgerow	Loss of habitat through clearance	Importance: Local Level of impact: Minor adverse	Compensation and further enhancements of hedgerow habitat	Landscape plan	Major beneficial
Birds	Changes to habitat extent	Importance: County Level of impact: Major adverse	Pre-vegetation removal/management check; Provision of offsite compensatory habitat	BMP	Minor beneficial impact
Post-completion stage					
Cotswold Water Park SSSI, Coke's Pit Lane LNR and North Meadow and Clattinger Farm SAC	Potential change in species composition relating to air quality	Importance: European/National Level of impact: No change	N/A	N/A	No change
Bats	Direct negative effects to the foraging and commuting behaviour of bat species associated with the Site from an increase in artificial light.	Importance: Local Level of impact: minor adverse (foraging bats).	Sensitive lighting scheme for bats and compensatory planting.	Lighting scheme and Landscape proposal.	Minor beneficial impact

	Direct negative effects to roosting bats during felling works.	Major adverse (roosting bats).	Bat Mitigation Licence.	Bat roost mitigation delivered in line with licence.	No change
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Conclusions

This chapter describes the baseline ecological conditions at the Site and provides an evaluation of the ecological resources that occur within the Site or have potential to be affected by operations within it. The chapter also describes in detail the potential ecological impacts resulting from the proposed scheme and describes the mitigation and avoidance measures that are required to reduce the magnitude of these effects.

The ecological receptors that have been identified include designated sites (Cotswold Water Park SSSI, Coke's Pit Lane LNR and North Meadow and Clattinger Farm SAC); habitats of principal importance (hedgerow); birds and bats.

Embedded mitigation, implemented through avoidance of habitat removal and development design include the retention of most of the Site's hedgerow resource and when not possible compensation on a like-for-like basis. Creation of species rich grassland is also proposed as part of the Proposed Development and offsite farmland nesting bird habitat creation. A sensitive lighting scheme will be designed to retain dark habitat for bats, and a bat mitigation licence will be obtained for removal of the tree containing a confirmed roost. Good-practice methods of working will be detailed and adhered to in the CEMP.

The ecological assessment has identified potential significant impacts on a subsection of the above receptors. Taking account of the avoidance, mitigation and compensation measures outlined in this chapter, no residual impacts are anticipated on the identified ecological receptors with the Proposed Development. All measures will be identified in a Construction Environmental Management Plan and Biodiversity Management Plan.

DRAWING 1

UK Habitat Survey



LEGEND

Site Boundary

Target Note: Tree with Bat Potential

Linear Habitat Features

h2a - Hedgerow (Priority Habitat)

u1e - Built Linear Feature

w1g6 - Line of Trees

UK Habitat Survey Classification

c1c - Cereal Crops

g4 - Modified Grassland

Secondary Habitats

69 - Fence

191 - Ditch



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ASHTON KEYNES, WILTSHIRE

PRELIMINARY ECOLOGICAL APPRAISAL

UKHAB SURVEY MAP

DRAWING 1

Scale 1:1,500 @ A3

Date MARCH 2023

DRAWING 2

Proposed Development Layout



NOTES

- SITE LAYOUT DETAILS TAKEN FROM DRAWING: 'GGP-29419-P-101-E-Ashton Keynes-Site Layout'
- PAVING DETAILS TAKEN FROM DRAWING: 'GGP-29419-P-120-A-Ashton Keynes-Paving.'

LEGEND

	SITE BOUNDARY
	EXISTING TREES AND HEDGEROW RETAINED
	EXISTING TREES AND HEDGEROW REMOVED
	PROPOSED NATIVE TREES AND SHRUBS
	PROPOSED NATIVE HEDGEROW
	PROPOSED NATIVE HEDGEROW INFILLING
	PROPOSED INDIVIDUAL TREES
	SHADE TOLERANT SPECIES RICH GRASSLAND
	SPECIES RICH WET GRASSLAND
	BUILDINGS
	GRAVEL AREA
	BREEDON AGRICULTURAL HOT ROLLED ASPHALT (HRA)
	CONCRETE
	TANK BUND BUILD UP
	TANK
	EQUIPMENT/FEEDER HOPPER SLAB
	COVERED LAAGOON
	RAINWATER LAAGOON
	DEER PROOF FENCING
	VISIBILITY SPLAY

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ASHTON KEYNES

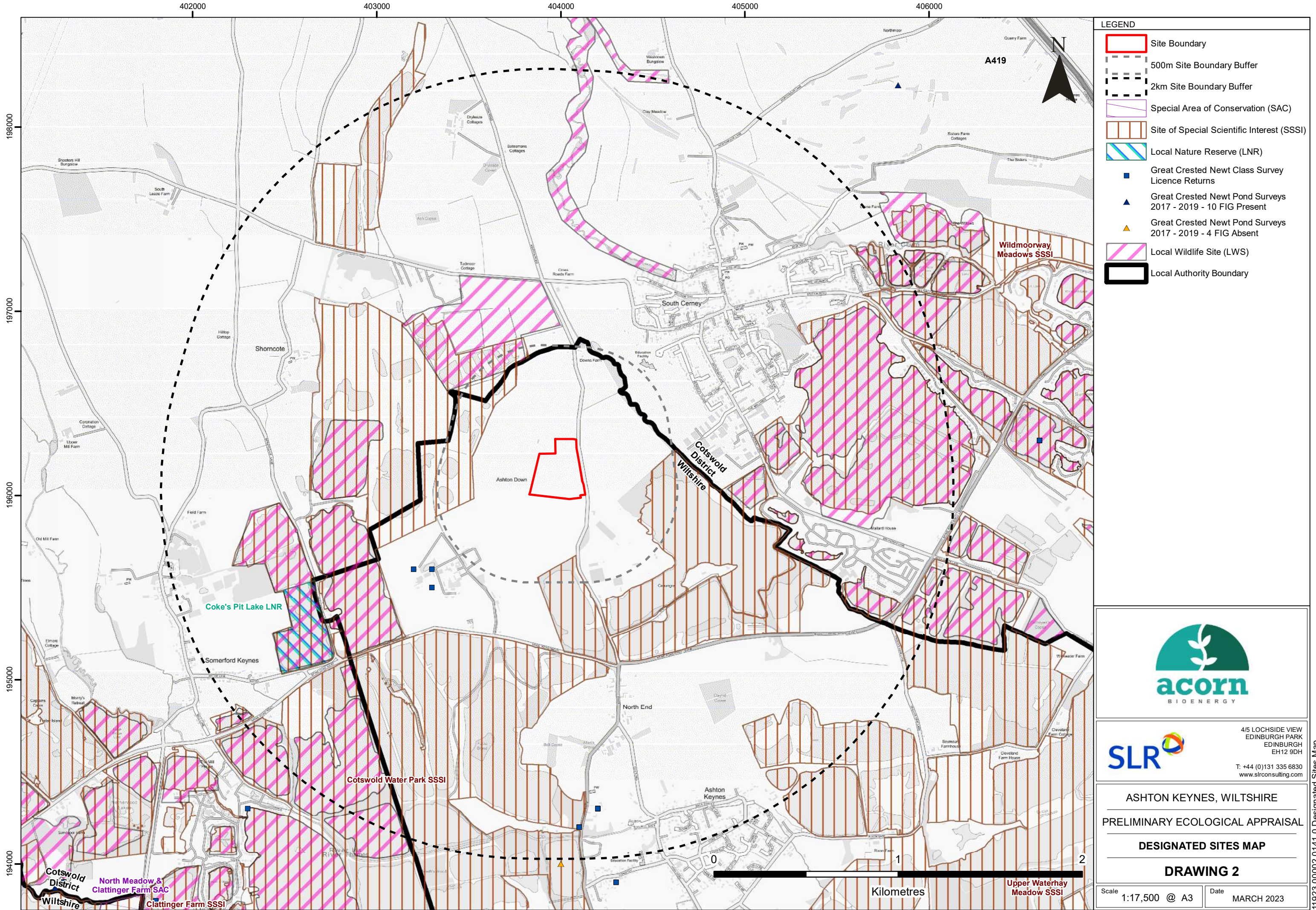
LANDSCAPE STRATEGY

FIGURE 6

Scale 1:1000 @ A2	Date APRIL 2023
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DRAWING 3

Designated Sites within 2 km



APPENDIX 01

Relevant Legislation and Planning Policy

Relevant Legislation and Planning Policy

Legislation

A summary of legislation relevant to (onshore) biodiversity in England and Wales is provided below. Note that the summary provided here is intended for general guidance only and the original legislation should be consulted for definitive information.

Environment Act (2021)

The Environment Act has wide ranging provisions including those around:

- Environmental governance;
- Environmental regulation;
- Waste and resource efficiency;
- Air quality and environmental recall;
- Water;
- Nature and biodiversity;
- Conservation covenants.

Of particular relevance is Part 6 of the Act which introduces “biodiversity gain in planning” and will apply in England to planning applications under the Town & Countryside Act and the Planning Act. Schedule 14 now requires that biodiversity gain be a condition of planning permission in England. These changes will be enacted through subsequent secondary legislation or regulations. This part of the Act also changes the responsibilities that Government or public bodies have by strengthening the existing NERC Act biodiversity duty. Public authorities are now required to seek to conserve and enhance biodiversity in the exercise of their functions.

Conservation of Habitats and Species Regulations 2017 (as amended)

The Conservation of Habitats and Species Regulations 2017 (as amended) (the Habitats Regulations) consolidate the Conservation of Habitats and Species Regulations 2010 with subsequent amendments. The Regulations transpose Council Directive 92/43/EEC, on the conservation of natural habitats and of wild fauna and flora (EC Habitats Directive), into national law. Under the Habitats Regulations it is an offence to deliberately capture, kill or disturb¹ wild animals listed under Schedule 2 of the Regulations as well as damage or destroy a breeding site or resting place of such an animal (even if the animal is not present at the time). European Sites, including Special Areas of Conservation (SACs) and Special Protection Areas (SPAs), are also protected under the Habitat Regulations, and any proposal that could affect them will require an Habitats Regulations Assessment (HRA).

The Water Environment (Water Framework Directive) (England and Wales) Regulations 2017

Part 3 of the regulations provide for the protection of areas of habitats or species where maintenance of the status of water is an important factor. Under the regulations additional consideration may need to be given to sites in the form of a Water Framework Directive (WFD) assessment where a project lies in proximity to a water body or to linked water bodies which could be affected. This includes consideration of whether water bodies are WFD receptors in particular those of high status or have high status morphology.

¹ Disturbance, as defined by the Conservation of Habitats and Species Regulations 2010, includes in particular any action which impairs the ability of animals to survive, breed, rear their young, hibernate or migrate (where relevant); or which affects significantly the local distribution or abundance of the species.

Natural Environment & Rural Communities (NERC) Act 2006

Section 40 of the NERC Act 2006 places a duty on public authorities to have regard to the purpose of conserving biodiversity in the exercise of their functions. Public authorities include government departments, local authorities and statutory undertakers.

Section 41 of the Act (Section 42 in Wales) requires the publication of a list of habitats and species publish which are of principal importance for the purpose of conserving biodiversity. The Section 41 list is used to guide authorities in implementing their duty to have regard to the conservation of biodiversity.

Note that Sections 40 and 42 were superseded in Wales by the Environment (Wales) Act 2016 (see below).

Protection of Badgers Act 1992

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

Wildlife & Countryside Act 1981

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

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

Planning Policy

A summary of national planning policy relevant to (onshore) biodiversity in England and Wales is provided below. Note that the summary provided here is intended for general guidance only and the original policy documents should be consulted for definitive information. For local planning policy relevant to biodiversity the relevant local plans should be consulted.

National Planning Policy (England)

The National Planning Policy Framework (NPPF)² sets out guidance for local planning authorities and decision-makers in how to apply planning policies when drawing up plans and making decisions about planning applications. Along with Government Circular 06/05², the broad policy objectives in relation to the protection of biodiversity and geological conservation in England through the planning system are set out. Specific policies relating to habitats and biodiversity are set out in paragraphs 174 and 179-182 of the NPPF.

² Ministry of Housing, Communities & Local Government (2021). [National Planning Policy Framework](#).

Paragraph 174 states that:

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

- a) protecting and enhancing valued landscapes, sites of biodiversity or geological value and soils (in a manner commensurate with their statutory status or identified quality in the development plan);*
- b) recognising the intrinsic character and beauty of the countryside, and the wider benefits from natural capital and ecosystem services – including the economic and other benefits of the best and most versatile agricultural land, and of trees and woodland;*
- c) maintaining the character of the undeveloped coast, while improving public access to it where appropriate;*
- d) minimising impacts on and providing net gains for biodiversity, including by establishing coherent ecological networks that are more resilient to current and future pressures;*
- e) preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of soil, air, water or noise pollution or land instability. Development*
- f) should, wherever possible, help to improve local environmental conditions such as air and water quality, taking into account relevant information such as river basin management plans; and*
- F) remediating and mitigating despoiled, degraded, derelict, contaminated and unstable land, where appropriate”.*

Paragraph 179 states that:

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

- a) Identify, map and safeguard components of local wildlife-rich habitats and wider ecological networks, including the hierarchy of international, national and locally designated sites of importance for biodiversity; wildlife corridors and stepping stones that connect them; and areas identified by national and local partnerships for habitat management, enhancement, restoration or creation; and*
- b) promote the conservation, restoration and enhancement of priority habitats, ecological networks and the protection and recovery of priority species; and identify and pursue opportunities for securing measurable net gains for biodiversity.”*

Paragraph 180 states that:

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

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

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

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

- a) potential Special Protection Areas and possible Special Areas of Conservation;*
- b) listed or proposed Ramsar sites; and*

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

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

APPENDIX 02

Biodiversity Net Gain (BNG) Assessment

PROPOSED ANAEROBIC DIGESTION FACILITY AT ASHTON KEYNES

Biodiversity Net Gain (BNG) Assessment
Prepared for: Acorn Bioenergy Limited

SLR Ref: 404.11923.00002
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Summary

While the provisions of the Environment Act 2021 have yet to be enacted through secondary legislation, the Act provides a useful definition and expectation of the future requirement for biodiversity gain in planning. The Act describes Biodiversity [Net] Gain objective as having been met '*...if the biodiversity value attributable to the development exceeds the pre-development biodiversity value of the onsite habitat by at least...10%*'.

This project is likely to deliver an increase in the habitat biodiversity value of the site of up to **19%** and in the linear habitat (hedgerow) an increase in biodiversity value of the site of up to **102%**. By demonstrating a level of enhancement at or greater than a 1% change the proposed development, in line with recent caselaw, is considered to satisfy the current requirement for biodiversity enhancement under the National Planning Policy Framework¹. The level of net gain also satisfies the future ambition of 10% BNG set out within the Environment Act.

The biodiversity gain identified within this report is subject to the development of landscape planting plans and site management plans to secure the predicted level of biodiversity delivery.

¹ Ministry of Housing, Communities & Local Government (2021). National Planning Policy Framework.

1.0 INTRODUCTION

SLR Consulting Ltd (SLR) was commissioned by Acorn Bioenergy Limited to undertake an evaluation of biodiversity performance and to undertake a Biodiversity Net Gain (BNG) assessment or BNG Plan for the proposed development located north of Ashton Keynes in Wiltshire (herein known as the 'Site').

The purpose of this BNG Plan is to inform the relevant planning authority of the biodiversity gain outcome.

1.1 Site Location & Description

The Site extends to approximately 7 hectares and is situated adjacent to Ashton Road on the eastern site boundary (National Grid Reference: SU 03988 96081). The Site and survey boundaries can be seen on **Drawing 1 – Habitat Plan**. The Site comprises agricultural land and encompasses two entire fields. It is bounded by further agricultural fields to the north, west and south, with the remaining eastern boundary bordering Ashton Road. The fields are bounded by hedgerows.

The nearest site designated for its ecological interest is Cotswold Water Park Site of Special Scientific Interest (SSSI), which surrounds the Site approximately 300m to the east, south and west and comprises a former gravel workings designated for its diverse assemblage of breeding birds.

1.2 Proposed Development Summary

The proposed development would import and treat in the region of 91,000 tonnes of feedstock per annum from the applicant's landholding and local farms, which would undergo a process of controlled decomposition (anaerobic digestion) within the Anaerobic Digestion (AD) facility. This anaerobic digestion generates biogas, which is upgraded on site into biomethane, before being removed by tanker to a central facility for injection into the national grid. The AD facility would have the capacity to produce approximately 9,711,888 Nm³ of biomethane per annum.

The feedstock would typically comprise the following:

- energy crops such as silage, rye, maize and grass;
- straw;
- slurry; and
- poultry litter and farmyard manure.

In addition to the biomethane, the AD process also produces a nutrient rich solid fertiliser and soil conditioner and a liquid fertiliser (digestate), which would be used on local farms in place of raw manures and artificial fertilisers.

The AD process would also result in the production of carbon dioxide (CO₂) as a natural by-product. This by-product is usually vented by AD plant operators, for whom the main goal is the production of biomethane. However, as CO₂ is a precious resource, the proposed AD plant would be fitted with equipment to upgrade the CO₂ to 99.9% purity, suitable for almost all industrial and commercial applications in the UK. Upgraded CO₂ would be liquefied and transported by road to end users within the market area. The proposed AD facility would capture approximately 14,681 tonnes of CO₂ a year.

The proposed layout can be seen at the end of this report (Drawing 2).

1.3 Purpose of this Report

This report is intended to provide the planning authority with sufficient information on the biodiversity performance of the proposed development to inform consideration of the planning application and specifically alignment of the application with the relevant planning policy.

1.4 Other supporting documents

This report is supported by a number of other documents or figures, including:

- Current Habitat Baseline Mapping (Drawing 1).
- Proposed Landscape Strategy (Drawing 2).
- Summary outputs or results from use of Natural England's Biodiversity Metric 3.1².

1.5 Relevant Policy and Legislation

1.5.1 Environment Act 2021

The Environment Act (the Act) gained Royal Assent on 9 November 2021 and is now enshrined within UK law. The Act provides a mechanism for implementing Government's ambitions for 'improving the natural environment', which were previously set out in publications including the 25 Year Environment Plan. The Act provides recognition of the 25 Year Environment Plan as the first "environmental improvement plan" which will, once the relevant regulations come into force, be used as the basis for understanding the steps Government intends to take to improve the natural environment.

The Act implements the ambitions for an improved natural environment, by setting out statutory or legal requirements which mandate action, under the oversight of the newly formed Office for Environmental Protection (OEP). The focus of the Act is the "...provision [of] targets, plans and policies for improving the natural environment..." and its requirements are structured around a number of broad themes.

Of relevance to this report Part 6 of the Act sets out provisions for 'Biodiversity gain as condition of planning permission'. Once enacted, amendments to the Town and Country Planning Act 1990 will in future (expected to be by November 2023) require planning applications to be supported with additional information on the change in the biodiversity value attributed to a project, with biodiversity metric calculations, and with biodiversity gain plans. Planning authorities will be required to consider these submissions in the exercise of their planning functions, to ensure that they are secured, approved and where relevant registered.

While the Environment Act is now part of UK law, its required actions do not commence either directly or immediately, for all parties. There remain a range of preparatory actions that need to be undertaken before further implementation of the wider legal framework (secondary legislation or regulations) will take place.

1.5.2 National Planning Policy Framework

A summary of national planning policy relevant to (onshore) biodiversity in England and Wales is provided below. Note that the summary provided here is intended for general guidance only and the original policy documents should be consulted for definitive information.

For local planning policy relevant to biodiversity the relevant local plans should be consulted.

² Natural England (2022). [The Biodiversity Metric 3.1 - JP039 \(naturalengland.org.uk\)](https://naturalengland.org.uk/biodiversity-metric-3-1-jp039)

National - The National Planning Policy Framework (NPPF), 2021

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

Paragraph 174 states that:

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

a) protecting and enhancing valued landscapes, sites of biodiversity or geological value and soils (in a manner commensurate with their statutory status or identified quality in the development plan); ...

d) minimising impacts on and providing net gains for biodiversity, including by establishing coherent ecological networks that are more resilient to current and future pressures; ...”

Paragraph 180 of the NPPF states that:

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

a) if significant harm to biodiversity resulting from a development cannot be avoided (through locating on an alternative site with less harmful impacts), adequately mitigated, or, as a last resort, compensated for, then planning permission should be refused; ...

c) development resulting in the loss or deterioration of irreplaceable habitats (such as ancient woodland and ancient or veteran trees) should be refused, unless there are wholly exceptional reasons and a suitable compensation strategy exists; and

d) development whose primary objective is to conserve or enhance biodiversity should be supported; while opportunities to improve biodiversity in and around developments should be integrated as part of their design, especially where this can secure measurable net gains for biodiversity or enhance public access to nature where this is appropriate.”

1.5.3 Local Planning Policy

Wiltshire Core Strategy⁵

Core Policy 50: Biodiversity and Geodiversity

“Biodiversity enhancement:

*All development should seek opportunities to enhance biodiversity. Major development in particular must include **measures to deliver biodiversity gains** through opportunities to restore, enhance and create valuable habitats, ecological networks and ecosystem services. Such enhancement measures will contribute to the objectives and targets of the Biodiversity Action Plan (BAP) or River Basin/ Catchment Management Plan, particularly through landscape scale projects, and be relevant to the local landscape character.*

North Wiltshire Local Plan⁶

NE11 Conserving Biodiversity

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

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

⁵ [untitled \(wiltshire.gov.uk\)](#)

⁶ [Microsoft Word - Written Statement Local Plan 2011- Adoptable Version.doc \(wiltshire.gov.uk\)](#)

Development proposals should ensure that species and habitats set out in the UK and local biodiversity action plans will be protected, and where possible, enhanced to help deliver BAP targets.

Development which would adversely affect, directly or indirectly, the biodiversity of the district will only be permitted when mitigating measures can be provided to retain and reinstate the level of biodiversity value. In order to achieve this, conditions and/or planning obligations will be used.

Appropriate management will also be encouraged through use of conditions, planning obligations and/or by entering into management agreements with landowners and developers, where appropriate

6.30 The UK BAP priority habitats that are found in North Wiltshire include:

- 1. Ancient and/or species rich hedgerows*
- 2. Caves and natural rock exposures*
- 3. Cereal field margins*
- 4. Eutrophic standing waters*
- 5. Lowland calcareous grassland*
- 6. Lowland meadows*
- 7. Lowland wood-pasture and parkland*
- 8. Reedbeds*
- 9. Wet woodland*

*6.31 Developers will be expected to submit an assessment of the ecological effects of their development proposal. If required, there should be a programme of avoidance, mitigation and management, that results in at least no net loss for biodiversity and **a net gain** where possible. Developers should seek opportunities for biodiversity gain; for example by the provision of land for creation of suitable habitats such as wetlands.*

2.0 Key Concepts

2.1 Overview

Natural England advise that Biodiversity Metric 3.1 *“can be used or specified by any development project, consenting body or landowner that needs to calculate biodiversity losses and gains for terrestrial and/or intertidal habitats. It will be this metric that underpins the Environment Bill’s provisions for mandatory biodiversity net gain in England...”*. It has become the standardised way of describing biodiversity change in England, noting that there are a limited number of local exceptions to its use. The biodiversity evaluation of the proposed development has been undertaken using Biodiversity Metric 3.1.

The Biodiversity Metric uses a comparison of habitats as a proxy for biodiversity and describes these habitats using standard units referred to as biodiversity units (BUs). There are 3 distinct types of BUs and these are not of equivalence or interchangeable, they are:

- Habitat BUs – which describe areas of habitat based on measurement in hectares;
- Linear BUs – which describe hedgerows and lines of trees measured in kilometres; and
- Riparian BUs – which described rivers and streams measured again in kilometres.

The overall calculation of the change in biodiversity resulting from a project or development is derived by subtracting pre-project or ‘baseline’ biodiversity units valuation of an area of land from the number of post-project units.

The results are influenced by:

- Habitat area/length;
- Distinctiveness (an indication of value);
- Condition – an indication of quality; and
- Multipliers or risk factors – that take account of the contribution to local priorities, the difficulty of habitat creation/management, the time it takes to deliver and variation in the location of habitat delivery.

2.2 Definitions

In the context of this project, we have assumed the following definitions:

- Biodiversity net gain (BNG) is an approach to development, and/or land management, that aims to leave the natural environment in a measurably better state than it was beforehand.

Under the Act the relevant percentage for Biodiversity Net Gain is a change in value attributed to a development $\geq 10\%$ the pre-development value (of onsite habitats). It should be noted that while the Act sets out the relevant percentage for Biodiversity Net Gain, the relevant parts of the Act (Section 98 and Schedule 14) are still subject to implementation through secondary legislation before they formally apply to applications.

In the interim, clarification of requirements for BNG have been set out through recent appeal decisions⁷ which have clarified that

- *“the 10% biodiversity net gain requirement set out in the Act is not yet law and is not applicable to these appeals”;*

⁷ Planning Inspectorate (2022). Appeal Decisions APP/Y3940/W/21/3278256, APP/Y3940/Q/21/3278923, APP/Y3940/W/21/3282365

- *“Paragraph 174 of the Framework [the NPPF encourages applicants to], ... seek a net gain in biodiversity without identifying a specific percentage...”*
- The relevant Core Strategy may *“...seek a net gain in biodiversity without identifying a specific percentage...”*; and
- *“A net gain of just 1% would be policy compliant in these circumstances.”*

2.3 Methodology

In supporting the assessment of biodiversity changes SLR have made reference to:

- [Biodiversity Metric 3.1 - Calculation Tool](#)
- [Biodiversity Metric 3.1 User Guide](#)
- [Biodiversity Metric 3.1 - Technical Supplement](#)

The Metric uses a unified habitat classification system known as UKHab. This system provides a number of benefits over existing systems such as Phase 1 and NVC, and allows Natural England, Scottish Natural Heritage, Natural Resources Wales, Department of the Environment Northern Ireland and JNCC to report consistently on habitats of European and national significance. UKHab information has been used where available to support the assessment of biodiversity changes.

Where habitat data has been recorded using the Phase 1 habitat classification system, these have been subject to conversion to UKHab classifications using the Metric Phase 1 translation tool.

In addition, the approach requires the condition of habitats to be assessed. Where habitat data was collected before the publication or widespread use of the Metric this is unlikely to have been collected and, in this case, an assumed condition rating has been adopted. Such variations from the Metric approach are explained in the relevant sections.

2.4 Metric 3.1 Principles and Rules

Natural England advise that the Metric is a tool that helps inform plans and decisions, by using habitats as a proxy for measuring biodiversity value, but that any assessment must be undertaken with awareness of its limitations. The metric specifically requires interpretation and ecological expertise to provide evidence of the appropriateness of proposed approaches to BNG and sets out a series of key principles and rules that help to support an understanding of whether proposals support wider considerations that a calculation output.

The Metric User Guide indicates that assessments should be conducted with regard to:

- **Principle 1:** *The metric does not change the protection afforded to biodiversity. Existing levels of protection afforded to protected species and habitats are not changed by use of this or any other metric. Statutory obligations will still need to be satisfied.*
- **Principle 2:** *Biodiversity metric calculations can inform decision-making where application of the mitigation hierarchy and good practice principles⁸ conclude that compensation for habitat losses is justified.*
- **Principle 3:** *The metric's biodiversity units are only a proxy for biodiversity and should be treated as relative values. While it is underpinned by ecological evidence the units generated by the metric are only*

⁸ CIEEM, CIRIA, IEMA (2016). Biodiversity Net Gain – Good Practice Principles for Development. https://www.cieem.net/data/files/Publications/Biodiversity_Net_Gain_Principles.pdf

a proxy for biodiversity and, to be of practical use, it has been kept deliberately simple. The numerical values generated by the metric represent relative, not absolute, values.

- **Principle 4:** *The metric focuses on typical habitats and widespread species; important or protected habitats and features should be given broader consideration.*
 - *Protected and locally important species needs are not considered through the metric, they should be addressed through existing policy and legislation.*
 - *Impacts on protected sites (e.g. SSSIs) and irreplaceable habitats are not adequately measured by this metric. They will require separate consideration which must comply with existing national and local policy and legislation. Data relating to these can be entered into the metric, so as to give an indicative picture of the biodiversity value of the habitats present on a site, but this should be supported by bespoke advice.*
- **Principle 5:** *The metric design aims to encourage enhancement, not transformation, of the natural environment. Proper consideration should be given to the habitats being lost in favour of higher-scoring habitats, and whether the retention of less distinctive but well-established habitats may sometimes be a better option for local biodiversity. Habitat created to compensate for loss of natural or semi-natural habitat should be of the same broad habitat type (e.g. new woodland to replace lost woodland) unless there is a good ecological reason to do otherwise (e.g. to restore a heathland habitat that was converted to woodland for timber in the past15).*
- **Principle 6:** *The metric is designed to inform decisions, not to override expert opinion. Management interventions should be guided by appropriate expert ecological advice and not just the biodiversity unit outputs of the metric. Ecological principles still need to be applied to ensure that what is being proposed is realistic and deliverable based on local conditions such as geology, hydrology, nutrient levels, etc. and the complexity of future management requirements.*
- **Principle 7:** *Compensation habitats should seek, where practical, to be local to the impact. They should aim to replicate the characteristics of the habitats that have been lost, taking account of the structure and species composition that give habitats their local distinctiveness. Where possible compensation habitats should contribute towards nature recovery in England by creating ‘more, bigger, better and joined up’ areas for biodiversity⁹.*
- **Principle 8:** *The metric does not enforce a mandatory minimum 1:1 habitat size ratio for losses and compensation but consideration should be given to maintaining habitat extent and habitat parcels of sufficient size for ecological function. A difference can occur because of a difference in quality between the habitat impacted and the compensation provided. For example, if a habitat of low distinctiveness is impacted and is compensated for by the creation of habitat of higher distinctiveness or better condition, the area needed to compensate for losses can potentially be less than the area impacted. However, consideration should be given to whether reducing the area or length of habitat provided as compensation is an appropriate outcome.*

In addition to these principles the Metric also sets out a series of rules that should be followed when undertaking a BNG calculation. These are:

- **Rule 1:** *Where the metric is used to measure change, biodiversity unit values need to be calculated prior to the intervention and post-intervention for all parcels of land / linear features affected.*

⁹ Making Space for Nature: a review of England’s wildlife sites and ecological network. Report to Defra (2010).

- **Rule 2:** *Compensation for habitat losses can be provided by creating new habitats, or by restoring or enhancing existing habitats. Measures to enhance existing habitats must provide a significant and demonstrable uplift in distinctiveness and/or condition to record additional biodiversity units.*
- **Rule 3:** *'Trading down' must be avoided. Losses of habitat are to be compensated for on a "like for like" or "like for better" basis. New or restored habitats should aim to achieve a higher distinctiveness and/or condition than those lost. Losses of irreplaceable or very high distinctiveness habitat cannot adequately be accounted for through the metric.*
- **Rule 4:** *Biodiversity unit values generated by biodiversity metric 3.1 are unique to this metric and cannot be compared to unit outputs from version 2.0, the original Defra metric or any other biodiversity metric. Furthermore, the three types of biodiversity units generated by this metric (for area, hedgerow and river habitats) are unique and cannot be summed.*
- **Rule 5:** *It is not the area/length of habitat created that determines whether ecological equivalence or better has been achieved but the net change in biodiversity units. Risks associated with creating or enhancing habitats mean that it may be necessary to create or enhance a larger area of habitat than that lost, to fully compensate for impacts on biodiversity.*
- **Rule 6:** *Deviations from the published methodology of biodiversity metric 3.1 need to be ecologically justified and agreed with relevant decision makers. While the methodology is expected to be suitable in the majority of circumstances it is recognised that there may be exceptions. Any local or project-specific adaptations of the metric must be transparent and fully justified.*

The Metric guidance also confirms:

- **Irreplaceable habitats** – the Metric does not adequately measure impacts on irreplaceable habitats and separate consideration should be given to relevant policy and legislation. These habitats can be entered into the calculator to give an indication of value or to support an understanding of enhancement or restoration actions and a guide to minimum areas of replacement habitats (compensation) but that *"bespoke compensation should be agreed with the relevant decision maker for any losses or impacts to these habitats"*.
- **Ancient woodland** – "Ancient woodland is a finite and irreplaceable resource and is protected by existing policy and legislation. However, ancient woodland is not a discrete habitat type and, as such, is not listed in biodiversity metric 3.1;
- **Woodland cover** – *"In England there is a presumption against the loss of woodland and a need to increase overall woodland cover. The metric trading rules support the delivery of this policy through requiring 'like for like' habitat replacement for all high distinctiveness woodland types."* With limited exceptions;
- **Hedgerows** – *"Lost double hedgerows should be compensated with a double hedge, typically a path or track width apart."*

2.5 Evidence of Technical Competent and Experience

Giselle Hynes, a Senior Field Ecologist at SLR, who wrote this report and completed the field survey, holds an MSc in Wildlife Management and Conservation from the University of Reading. She is a qualified member of the Chartered Institute of Ecology and Environmental Management (CIEEM). Giselle has been a consultant ecologist for more than 3 years and has prepared reports for a range of different projects and plans.

Olivia Guindon, a Senior Ecologist at SLR Consulting, who reviewed this report has a Bachelor's degree in Ecology and Wildlife Conservation (BSc Hons) and a Master's degree in Species Identification and Survey Skills and is a Qualifying member of CIEEM. Olivia has over four years' professional experience within ecological consultancy and has undertaken numerous ecological assessments of this type.

Ruth Holland ACIEEM, who reviewed this report, is an Associate Ecologist, with a BSc in Ecology and Conservation Management and a MSc in Biological Recording. She has over nine years of experience as a professional ecological consultant, during which time she has worked on many development projects.

2.6 Limitations

For areas of habitat creation 'Moderate' condition has been set, as habitat objectives in all cases except for those habitats which have default condition scores in the Metric e.g. 'Poor' condition.

No significant limitations were encountered during completion of the Biodiversity Net Gain assessment. Natural England note that Biodiversity Metric 3.1 has been extensively tested, but that they continue to listen to feedback to support correction of any errors or problems. No such errors were encountered.

3.0 Baseline Habitats

3.1 Pre-development Habitats (On-site)

Full description of the baseline habitats within the Site are provided within the Preliminary Ecological Appraisal report (ref: 20230331 404.11923.00002 Ashton Keynes PEA fv1.pdf). This habitat survey was undertaken in accordance with UKHab methodology and using the associated classification system. The survey was undertaken in September 2022 and a summary of the habitats is given in Table 3-1 and presented at Drawing 1.

Table 3-1 On Site Baseline Habitats within the Proposed Development Site

Broad Habitat	Habitat Type	Size	Description
Cropland	Cereals crops	6.99 ha	Two parcels of cultivated land
H2a	Hedgerow	0.83 km	Native hedgerows with scattered trees around boundary of fields
Grassland	Modified grassland	0.01 ha	Narrow field margins comprise of strips of actively managed grassland

3.2 Pre-development Habitats (Off-site)

Just to the northwest of the site is a section of native species rich hedgerow shown at **Drawing 1**. It measures 0.83 km in length.

Consideration of principles and rules

This report has recognised the ‘trading down’ rule (rule 3), the need to avoid such situations and specifically any losses of irreplaceable or very high distinctiveness habitat. In considering any proposed works to the Site, existing linear features including hedgerows will be retained, and consideration has been given to their enhancement. If required, such habitats will need to be replaced on a “like for like” or “like for better” basis.

3.3 Baseline Habitat Value (On-site)

The total area of the site is approximately 7.00 ha. This includes areas of cropland (6.99 ha), grassland habitat (0.01 ha). Of these the areas of cropland have the highest biodiversity value (13.97 BU) and the grassland habitat (0.06 BU). The total overall ecological baseline (habitat) is around 14.03 BU (habitats).

The baseline also contains a linear habitat, specifically a length of native hedgerow with trees. This hedgerow surrounds and bisects the centre of the Site and measures 0.83 km in length, having a baseline value of 6.66 BU (linear).

3.4 Baseline Habitat Value (Off-site)

The length of hedgerow offsite measures 0.83 km and delivers 1.14 BU.

3.5 Overall Baseline Habitat Value

A summary of the current baseline biodiversity value to two decimal place is given in Table 3-2.

Table 3-2 Summary of Baseline Habitat Value

BIODIVERSITY UNIT TYPE	AREA/LENGTH		BASELINE UNITS		TOTAL UNITS
	On site	Off site	On site	Off site	
Area habitat (On Site)	7.00 ha	0	14.03 BU	N/A	14.03
Linear habitat – Hedgerows	0.83 km	0.12 km	6.66	1.14	6.66
Linear habitat – Rivers and streams	N/A	N/A	N/A	N/A	N/A

4.0 Post Development Habitats

4.1 Habitat Units

Biodiversity calculations have been completed for:

- Comparison of the current site baseline with the proposed plans.

This comparison supports an understanding of the differences in biodiversity performance of proposed development between the current on-site habitats with the proposed plans.

The proposed plans are illustrated at Drawing 2 at the end of this report.

4.2 Current Baseline to Proposed Plans (onsite)

In line with Metric 3.1 a comparison has been made between the current site baseline and the proposed post-intervention habitats on site.

4.2.1 Habitats Units

Once the proposed plans have been delivered, the total area of habitats within the development site is estimated to be approximately 7.00 ha, comprising 2.37 ha of habitat creation and 4.63 ha of developed land. No existing habitats are being retained.

The proposed onsite change would lead to an increase in the area of developed land; sealed surface (+4.63 ha) and the creation of other neutral grassland (+1.55 ha), mixed scrub (+0.82 ha) and urban trees (+0.26 ha). There would be a reduction in the area of cropland (-6.99 ha) and modified grassland (-0.01 ha). Increases in the area of other neutral grassland, mixed scrub and urban trees will support improved biodiversity performance.

Overall, the project is expected to lead to an increase of 2.62 Habitat BU on site, which corresponds to an increase of **18.69%** in biodiversity value.

4.2.2 Hedgerow Units

Once the proposed plans are delivered, the total length of hedgerow within the development site is estimated to be approximately 0.88 km. This includes retention of 0.57km of hedgerow surrounding the site and creation 0.31 km of new hedgerow and also includes the loss of hedgerow in poor condition, located in the centre of the site (-0.26 km).

The created hedgerow will be of moderate condition, and as such supports an increase of 6.77 BU. The project would deliver an increase in the hedgerow biodiversity value of the site of **101.65%**.

4.3 Current Baseline to Proposed Plans (off-site)

Once the proposed management plans are delivered, the total length of off-site hedgerow is still estimated to be 0.12 km. The proposed management of this habitat would lead to an increase in biodiversity units of 0.93 units.

4.4 Current Baseline to Proposed Plans (Overall)

Overall, the proposed plans are expected to support changes in habitat area and hedgerow length of **18.69%** and **101.65%**, respectively, which satisfies the current requirement for biodiversity enhancement under the National Planning Policy Framework. An overall summary of the proposed biodiversity gain is given in Table 4-1.

The biodiversity gain identified within this report requires planting plans and management plans to secure the predicted level of gain.

Table 4-1 Summary of biodiversity net gain

BIODIVERSITY UNIT TYPE	BASELINE UNITS		POST INTERVENTION UNITS		TOTAL NET UNIT CHANGE	% NET GAIN
	On site (dev. Site)	Off site	On site (dev. site)	Off site		
Area habitat	14.03 BU	0	16.65 BU	0	+ 2.62 BU	18.69 %
Linear habitat – Hedgerows	6.66 BU	1.14	12.51 BU	2.07	+ 6.77 BU	101.65 %
Linear habitat - Rivers/streams	N/A	N/A	N/A	N/A	N/A	N/A

5.0 Recommendations for Achieving Biodiversity Net Gain

The assessment of the proposed development against the current baseline indicates that an increase in biodiversity performance of the Site of approximately **19%** in habitat and **102%** in hedgerow can be achieved. This is subject to appropriate planting plans and management plans being developed to optimise the delivery of biodiversity performance on the Site and to realise its intended out-turn condition.

This is considered to satisfy the current requirement for biodiversity enhancement under the National Planning Policy Framework¹².

There remain further opportunities for refinement and improvement of the biodiversity performance of the proposed development which will be considered as part of detailed design of this project.

DRAWING 1

Baseline Habitat Map



LEGEND

Site Boundary

Target Note: Tree with Bat Potential

Linear Habitat Features

h2a - Hedgerow (Priority Habitat)

u1e - Built Linear Feature

w1g6 - Line of Trees

UK Habitat Survey Classification

c1c - Cereal Crops

g4 - Modified Grassland

Secondary Habitats

69 - Fence

191 - Ditch







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ASHTON KEYNES, WILTSHIRE

PRELIMINARY ECOLOGICAL APPRAISAL

UKHAB SURVEY MAP

DRAWING 1

Scale1:1,500 @ A3

DateMARCH 2023

DRAWING 2

Proposed Landscape Strategy



NOTES

- SITE LAYOUT DETAILS TAKEN FROM DRAWING: 'GGP-29419-P-101-E-Ashton Keynes-Site Layout'
- PAVING DETAILS TAKEN FROM DRAWING: 'GGP-29419-P-120-A-Ashton Keynes-Paving.'

LEGEND

	SITE BOUNDARY
	EXISTING TREES AND HEDGEROW RETAINED
	EXISTING TREES AND HEDGEROW REMOVED
	PROPOSED NATIVE TREES AND SHRUBS
	PROPOSED NATIVE HEDGEROW
	PROPOSED NATIVE HEDGEROW INFILLING
	PROPOSED INDIVIDUAL TREES
	SHADE TOLERANT SPECIES RICH GRASSLAND
	SPECIES RICH WET GRASSLAND
	BUILDINGS
	GRAVEL AREA
	BREEDON AGRICULTURAL HOT ROLLED ASPHALT (HRA)
	CONCRETE
	TANK BUND BUILD UP
	TANK
	EQUIPMENT/FEEDER HOPPER SLAB
	COVERED LAAGOON
	RAINWATER LAAGOON
	DEER PROOF FENCING
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ASHTON KEYNES

LANDSCAPE STRATEGY

FIGURE 6

Scale	1:1000 @ A2	Date	APRIL 2023
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APPENDIX 1

Habitat Condition Assessment Sheets

Condition sheet: HEDGEROW Habitat Types				
UKHab Habitat Type				
Native hedgerow Native hedgerow - associated with bank or ditch Native hedgerow with trees Native hedgerow with trees - associated with bank or ditch Native species rich hedgerow Native species rich hedgerow - associated with bank or ditch Native species rich hedgerow with trees Native species rich hedgerow with trees - associated with bank or ditch				
Site name/Location	Native hedgerow with trees - associated with bank or ditch		Onsite/offsite	Onsite
Habitat's central grid reference	SU 03976 96081		Unique polygon reference(s)	
Limitations (if applicable)			Metric 3.1 survey reference (if condition assessment of this polygon relates to a wider habitat survey)	
Habitat Description				
The centre of the site was bisected by a hedgerow with trees, associated with a ditch, which was dry at time of survey. The hedgerow had large gaps in both the base and in the hedge canopy and comprised predominantly hawthorn. Other species present included crab apple (<i>Malus sylvestris</i>), bramble, field maple, blackthorn, dog rose and ivy. The hedgerow also contained a semi-mature ash (<i>Fraxinus excelsior</i>) at the westernmost end.				
See Table TS1-3 of the Technical Supplement.				
Condition Assessment Criteria				
A series of ten attributes, representing key physical characteristics, are used for this assessment. The attributes, and the minimum criteria for achieving a favourable condition in each, are defined. The attributes use similar favourable condition criteria to the Hedgerow Survey Handbook and the handbook is the recommended source of reference for assessing individual hedgerow attributes.				
Hedgerow favourable condition attributes				
Attributes and functional groupings (A, B, C, D & E)	Criteria (the minimum requirements for 'favourable condition'	Description	Condition Achieved (Y/N)	Notes/Justification
Core groups - applicable to all hedgerow types				
A1. Height	>1.5 m average along length	The average height of woody growth estimated from base of stem to the top of shoots, excluding any bank beneath the hedgerow, any gaps or isolated trees. Newly laid or coppiced hedgerows are indicative of good management and pass this criterion for up to a maximum of four years (if undertaken according to good practice). A newly planted hedgerow does not pass this criterion (unless it is > 1.5 m height).	Y	>1.5 m in height
A2. Width	>1.5 m average along length	The average width of woody growth estimated at the widest point of the canopy, excluding gaps and isolated trees. Outgrowths (e.g. blackthorn suckers) are only included in the width estimate when they >0.5 m in height. Laid, coppiced, cut and newly planted hedgerows are indicative of good management and pass this criterion for up to a maximum of four years (if undertaken according to good practice ⁴).	Y	>1.5m in width
B1. Gap - hedge base	Gap between ground and base of canopy <0.5 m for >90% of length (unless 'line of trees')	This is the vertical gappiness of the woody component of the hedgerow, and its distance from the ground to the lowest leafy growth. Certain exceptions to this criterion are acceptable (see page 65 of the Hedgerow Survey Handbook).	N	Many vertical gaps
B2. Gap - hedge canopy continuity	Gaps make up <10% of total length and No canopy gaps >5 m	This is the horizontal gappiness of the woody component of the hedgerow. Gaps are complete breaks in the woody canopy (no matter how small). Access points and gates contribute to the overall gappiness, but are not subject to the >5 m criterion (as this is the typical size of a gate).	N	Many horizontal gaps
C1. Undisturbed ground and perennial vegetation	>1 m width of undisturbed ground with perennial herbaceous vegetation for >90% of length: - measured from outer edge of hedgerow, and - is present on one side of the hedge (at least)	This is the level of disturbance (excluding wildlife disturbance) at the base of the hedge. Undisturbed ground should be present for at least 90% of the hedgerow length, greater than 1m in width and must be present along at least one side of the hedge. This criterion recognises the value of the hedge base as a boundary habitat with the capacity to support a wide range of species. Cultivation, heavily trodden footpaths, poached ground etc. can limit available habitat niches.	N	Arable immediately either side.
C2. Undesirable perennial vegetation	Plant species indicative of nutrient enrichment of soils dominate <20% cover of the area of undisturbed ground	The indicator species used are nettles (<i>Urtica</i> spp.), cleavers (<i>Galium aparine</i>) and docks (<i>Rumex</i> spp.). Their presence, either singly or together, should not exceed the 20% cover threshold.	Y	Not recorded during survey.

D1.	Invasive and neophyte species	>90% of the hedgerow and undisturbed ground is free of invasive non-native and neophyte species	Neophytes are plants that have naturalised in the UK since AD 1500. For information on neophytes see the JNCC website and for information on invasive non-native species see the GB Non-Native Secretariat website.	Y	No invasive species recorded during survey.
D2.	Current damage	>90% of the hedgerow or undisturbed ground is free of damage caused by human activities	This criterion addresses damaging activities that may have led to or lead to deterioration in other attributes. This could include evidence of pollution, piles of manure or rubble, or inappropriate management practices (e.g. excessive hedge cutting).	N	Evidence of cutting.
Additional group - applicable to hedgerows with trees only					
E1.	Tree age	At least one mature tree per 30m stretch of hedgerow. A mature tree is one that is at least 2/3 expected fully mature height for the species.	This criterion addresses if there are sufficient mature trees (within the scope of planning timescales) which are of higher value to biodiversity.	N	Only one semi-mature tree
E2.	Tree health	At least 95% of hedgerow trees are in a healthy condition (excluding veteran features valuable for wildlife). There is little or no evidence of an adverse impact on tree health by damage from livestock or wild animals, pests or diseases, or human activity.	This criterion identifies if the trees are subject to damage which compromises the survival and health of the individual specimens.	Y	No evidence of damage
Each attribute is assigned to one of five functional groups (A – E), as indicated in Table TS1-2 and the condition of a hedgerow is assessed according to the number of attributes from these functional groups which pass or fail the ‘favourable condition’ criteria according to the approach set out in Table TS1-3.					
The hedgerow condition assessment generates a weighting (score) ranging from 1-3, which is used within the biodiversity metric 3.1. The scores for each are set out in tables TS1-3 and TS1-4 below.					
TABLE TS1-3: Hedgerow condition assessment and weighting					
Condition categories for hedgerows without trees					
Category	Maximum number of attributes that can fail to meet ‘favourable condition’ criteria in Table TS1-2	Weighting (score)			
Good	No more than 2 failures in total; AND No more than 1 in any functional group.	3			
Moderate	No more than 4 failures in total; AND <u>Does not fail both attributes</u> in more than one functional group (e.g. fails attributes A1, A2, B1 & C2 = Moderate condition).	2			
Poor	Fails a total of more than 4 attributes; OR <u>Fails both attributes</u> in more than one functional group (e.g. fails attributes A1, A2, B1 & B2 = Poor condition).	1			
Score achieved:					
Condition categories for hedgerows with trees					
Category	Maximum number of attributes that can fail to meet ‘favourable condition’ criteria in Table TS1-2	Weighting (score)			
Good	No more than 2 failures in total; AND No more than 1 failure in any functional group.	3			
Moderate	No more than 5 failures in total; AND <u>Does not fail both attributes</u> in more than one functional group (e.g. fails attributes A1, A2, B1, C2 & E1 = Moderate condition).	2			
Poor	Fails a total of more than 5 attributes; OR <u>Fails both attributes</u> in more than one functional group (e.g. fails attributes A1, A2, B1 & B2 = Poor condition).	1			
Score achieved:	Poor, fails B1 and B2 functional group				
Suggested enhancement interventions to improve condition score					

Condition Sheet: GRASSLAND Habitat Type (low distinctiveness)			
UKHab Habitat Type(s)			
Grassland - Modified grassland			
Site name/location	Ashton Keynes	Onsite/offsite	Onsite
Central grid reference of habitat	SU 03854 96078	Unique polygon reference	
Limitations (if applicable)		Metric 3.0 survey reference (if condition assessment of this polygon relates to a wider habitat survey)	
Habitat Description Small area of modified grassland in gateway between arable and adjacent field. Very damaged with track marks due to frequent vehicular use. Species in this area comprised common nettle, cow parsley (<i>Anthriscus sylvestris</i>), hedge mustard (<i>Sisymbrium officinale</i>), false oat-grass (<i>Arrhenatherum elatius</i>), red dead nettle (<i>Lamium purpureum</i>), cleavers (<i>Galium aparine</i>), shepherd's purse (<i>Capsella bursa-pastoris</i>) and creeping thistle (<i>Cirsium arvense</i>).			
See UKHab			
Condition Assessment Criteria		Condition Achieved (Y/N)	Notes/Justification
1	There must be 6-8 species per m2. If a grassland has 9 or more species per m2 it should be classified as a medium distinctiveness grassland habitat type. NB - this criterion is essential for achieving moderate condition.	N	Species poor predominantly false oat grass with sporadic common nettle, cow parsley, hedge mustard, red dead nettle, cleavers, shepherd's purse and creeping
2	Sward height is varied (at least 20% of the sward is less than 7 cm and at least 20% is more than 7 cm) creating microclimates which provide opportunities for insects, birds and small mammals to live and breed.	Y	Tussocky in nature
3	Some scattered scrub (including bramble) may be present, but scrub accounts for less than 20% of total grassland area. Note - patches of shrubs with continuous (more than 90%) cover should be classified as the relevant scrub habitat type.	Y	No scrub.
4	Physical damage is evident in less than 5% of total grassland area. Examples of physical damage include excessive poaching, damage from machinery use or storage, erosion caused by high levels of access, or any other damaging management activities.	N	High levels of access causing extensive patches of bare ground.
5	Cover of bare ground is between 1% and 10%, including localised areas (for example, a concentration of rabbit warrens).	N	As above
6	Cover of bracken less than 20%.	Y	No bracken.
7	There is an absence of invasive non-native species (as listed on Schedule 9 of WCA, 1981).	Y	No invasive species recorded during surveys.
		Essential criterion 1 achieved (Y/N)	N
		Number of criteria passed	4
Condition Assessment Result	Condition Assessment Score	Score Achieved x/✓	
Passes 6 or 7 of 7 criteria including passing essential criterion 1	Good (3)		
Passes 4 or 5 of 7 criteria including passing essential criterion 1	Moderate (2)		
Passes 0, 1, 2 or 3 of 7 criteria; OR 4, 5 or 6 of criteria but failing criterion 1	Poor (1)	Y	
Suggested enhancement interventions to improve condition score			

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APPENDIX 03

Winter and Breeding Bird Survey Report

PROPOSED ANAEROBIC DIGESTION FACILITY AT ASHTON KEYNES

Appendix 3: Winter and Breeding Bird Surveys Prepared for: Acorn Bioenergy

SLR Ref: 404.11923.00004
Version No: 1
August 2023



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DOCUMENT REFERENCES

APPENDICES

- Appendix 1: Winter Bird Survey Results Drawings
- Appendix 2: Breeding Bird Survey Results Drawings
- Appendix 3: Full List of Bird Species Recorded – Winter Bird Surveys
- Appendix 4: Full List of Bird Species Recorded – Breeding Bird Surveys
- Appendix 5: Land Within Client Ownership

1.0 Introduction

In December 2022, SLR Consulting Limited was commissioned by Acorn Bioenergy to undertake an ornithological baseline survey of land earmarked for development located north of Ashton Keynes.

This report presents the findings of surveys for wintering and breeding birds. Four winter bird survey visits were undertaken across the whole site between December 2022 and February 2023, following an adapted form of the standard non-breeding walkover survey methodology (Bird Survey Guidelines¹). Five breeding bird survey visits were undertaken across the whole site between March and July 2023 following Breeding Bird Survey guidelines².

The aim of the survey work was to determine the status of the winter and breeding assemblage of birds using the site, and to evaluate the ornithological nature conservation interest of the site.

1.1 Site Description

The application site, (the Site) extends to approximately 6.98 hectares (ha) and is centred on National Grid coordinates (403993, 196195). The Site and survey boundaries can be seen on Appendices 1 and 2.

The Site consists of a broadly rectangular area of arable land and comprises one full field and the adjoining northern part of a second field situated immediately to the south. Both the fields are in arable use, there is an intermittent hedgerow and low trees that dissects the two fields, a shallow drainage ditch also lies on the northern side of this divide.

The Site falls entirely within the administrative boundary of Wiltshire County Council and is situated on Ashton Down and is located in the eastern section of this area. It is bordered by mature trees and hedgerows on all sides bar the southern section where it bisects the southern boundary. The Site itself is also surrounded on all sides by similar flat, open arable fields, further shallow drainage ditches are present outside the north and eastern boundaries. An unsurfaced access track runs along the western boundary, likewise Ashton Road runs along the Site to the east.

Beyond Ashton Road, to the east, is a previous historic landfill site, which has since been restored to sheep pasture. To the south-east is an Aggregate Industries concrete works.

The nearest statutory site designated for its ecological interest is the Cotswold Water Park, a Site of Special Scientific Interest (SSSI), which surrounds the Site approximately 300m to the east, south and west and comprises a large network of former gravel workings and associated land designated for its diverse assemblage of breeding and non-breeding birds.

¹ [Non-breeding Walkover Survey | Bird Survey Guidelines](#) (accessed 20/07/2023)

² [Survey methodology | Bird Survey Guidelines](#)(accessed 20/7/23)

2.0 Relevant legislation and Information Regarding Conservation Status

2.1 Legislative Background

2.1.1 Wildlife and Countryside Act 1981(as amended)

Section 1, Part I of the Wildlife and Countryside Act 1981 (as amended) (WCA 1981) makes it an offence (with certain limited exceptions and in the absence of a licence) to **intentionally**:

- kill, injure or take any wild bird;
- damage, take or destroy its nest while that nest is in use or being built; or
- take or destroy its eggs.

A person shall also be guilty of an offence if they possess or control any live or dead wild bird or any part of, or anything derived, from such a bird, or an egg of a wild bird or any part of such an egg.

Further, the Act affords additional protection to specific species of birds listed in Schedule 1 of the Act. It is an offence **intentionally or recklessly** to:

- disturb a bird listed on Schedule 1 while it is nest building, or at a nest containing eggs or young; or
- disturb the dependent young of such a bird.

2.1.2 The Natural Environment and Rural Communities (NERC) Act 2006

The NERC Act came into force on 1st October 2006. Section 41 (S41) of the Act requires the Secretary of State to publish a list of habitats and species which are of principal importance for the purpose of conserving biodiversity in England. The list has been drawn up in consultation with Natural England, as required by the Act.

The S41 list is used to guide decision-makers such as public bodies, including local and regional authorities, in implementing their duty under section 40 of the Natural Environment and Rural Communities Act 2006, to have regard to the conservation of biodiversity in England, when carrying out their normal functions.

Species of Principal Importance

There are 943 species of principal importance included on the S41 list, including a number of bird species. These are the species found in England which were identified as requiring action under the UK BAP and which continue to be regarded as conservation priorities under the UK Post-2010 Biodiversity Framework. In addition, the hen harrier (*Circus cyaneus*) has also been included on the list because without continued conservation action it is unlikely that the hen harrier population will increase from its current very low levels in England.

In accordance with Section 41(4) the Secretary of State will, in consultation with Natural England, keep this list under review and will publish a revised list if necessary.

2.2 Information Regarding Conservation Status

2.2.1 Birds of Conservation Concern (BoCC) (Stanbury *et al.*, 2021³)

The UK's birds are split into three categories of conservation concern – red, amber and green. Red is the highest conservation priority, with species needing urgent action. Amber is the next most critical group, followed by green. The criteria are shown below in Table 2-1:

Table 2-1
BoCC criteria³

Red criteria	Amber criteria
Species that are globally threatened according to the International Union for the Conservation of Nature (IUCN) criteria.	Species of European Conservation Concern.
Species with an historical decline in breeding population which have not shown a substantial recent recovery.	Species whose population has declined historically but which have made a substantial recent recovery.
Species that have shown a severe breeding decline over the last 25 years or longer term.	Species whose breeding population has declined moderately over the last 25 years or longer term.
Species that have shown a severe breeding range decline over the last 25 years or longer term.	Species that have shown a moderate breeding range decline over the last 25 years or longer term.
Species whose non-breeding population has declined over the last 25 years or longer term.	Species whose non-breeding population has declined moderately over the last 25 years or longer term.
	Rare breeders or non-breeding rarity species with internationally important or localised populations.
Green list criteria	
Species that fulfil none of the Red or Amber criteria detailed above at the publication of the most recent edition of BoCC, currently 2021.	

³ Stanbury, A.J., Eaton, M.A., Aebischer, N.J., Balmer, D., Brown, A.F., Douse, A., Lindley, P., McCulloch, N., Noble, D.G. & Win, I. (2021) 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, Volume 114, 25pp

3.0 Methodology

3.1 Bird Surveys

The winter and breeding bird surveys were undertaken by Giselle Hynes (MSc and Qualifying Member of CIEEM), an ornithologist and Senior Ecologist with SLR Consulting with four years of experience, between November 2022 and July 2023.

The surveyor walked around the Site to record birds, noting in particular BoCC, S41 species, birds of prey, waterfowl- due to the nearby SSSI and large flocks of species that were actively using the site for shelter, feeding or hunting. Additionally for the breeding bird surveys, there was a focus on species showing signs of territorial or breeding behaviour. Breeding bird status was assigned using the BTO criteria, refer to Table 3-1.

Table 3-1
BTO evidence criteria used to establish breeding status

Breeding status categories	Evidence criteria
Confirmed breeding	- Distraction display or injury feigning; - Used nests or eggshells found (occupied or laid within the survey period); - Recently fledged young or downy young; - Adults entering or leaving a nest site in circumstances indicating Occupied - Nest or an adult sitting on nest; - Adults carrying food for young or faecal sacs; - Nest containing eggs; - Nest with young seen or heard.
Probable breeding	- Pairs observed in suitable nesting habitat in breeding season; - Permanent territory presumed through registration or territorial behaviour (song etc.) on at least two different days, a week apart, at the same place; - Display and courtship; - Visiting probable nest site; - Agitated behaviour or anxiety calls from adults; - Building nest or excavating nest hole.
Possible breeding	- Species observed in breeding season in possible nesting habitat. - Singing male(s) present or breeding calls heard in breeding season

Bird registrations were recorded on field maps using British Trust for Ornithology (BTO) activity codes and one or two-letter species codes.

A summary of the survey metadata for the survey sessions can be found in Table 3-2.

Table 3-2
Bird Survey Metadata

Survey Date	Survey Period	Weather Conditions
Winter Bird Survey		
11/11/2022	06:50-09:00	Dry, wind force 4 ⁴ , 8/8 cloud, 14°C
16/12/2022	07:40-09:45	Dry, wind force 3, 0/8 cloud, -9°C
04/01/2023	07:46-10:00	Dry, wind force 3, 4/8 cloud, 11°C
07/02/2023	07:08-09:15	Dry, wind force 0-1, 0/8 cloud, -3°C
Breeding Bird Survey		
29/03/2023	06:19-08:00	Dry, wind force 3, 8/8 cloud, 9°C
12/04/2023	05:46-07:20	Dry, wind force 3, 8/8 cloud, 3°C
19/05/2023	04:36-06:40	Dry, wind force 0-1, 6/8 cloud, 11°C
20/06/2023	04:14-06:15	Dry, wind force 0-1, 6/8 cloud, 18°C
12/07/2023	04:29-06:30	Dry, wind force 0, 1/8 cloud, 12°C

3.2 Nomenclature

The sequence and nomenclature follows the British List 8th Edition⁵, as updated by recommendations of the British Ornithologists' Union Records Committee (BOURC) Taxonomic Sub-Committee⁶.

English names broadly follow Birds of the Western Palearctic⁷ (BWP) and generally concur with those in common usage.

⁴ Wind force measured using the Beaufort scale ranging from 0 (calm)-12 (hurricane).

⁵ Harrop, A. H. L., Collinson, J. M., Dudley, S. P., Kehoe, C. & The British Ornithologists' Union Records Committee (BOURC) (2006) The British List: A Checklist of Birds of Britain (8th edition). Ibis 155: pp 635-676

⁶ Knox, A. G., Collinson, M., Parkin, D. T., Sangster, G. & Svensson, L. (2008) Taxonomic recommendations for British birds: Fifth report. Ibis 150: pp 833-835

⁷ Cramp, S., Simmonds, K. E. M. & Perrins, C. M. [Eds] (1977-1994) *The Birds of the Western Palearctic*. Volume 1-9. Oxford University Press, Oxford

4.0 Results

4.1 Desk Study

There are three statutory sites located within 5km of the Site, comprising:

- Cotswold Water Park SSSI;
- Coke's Pit Lake LNR; and,
- North Meadow and Clattinger Farm SAC.

North Meadow and Clattinger Farm SAC is designated for its floristic value and as such is considered no further in this report. However, the citations for Cotswold Water Park SSSI and Coke's Pit Lake LNR refer to their assemblages of birds. These are detailed in Table 4.1 below.

Table 4-1
Statutory Sites within 5km of the Site Boundary

Site Name	Distance (m) and Direction from site	Site Description
Statutory Sites		
Cotswold Water Park SSSI	58 south	A former gravel workings comprising the UK's largest marl lake system. The site is of special interest due to the nationally important species it supports, comprising a diverse assemblage of breeding birds of lowland open waters, their margins and scrub. Bird species include great crested grebe <i>Podiceps cristatus</i> , little egret <i>Egretta garzetta</i> , lapwing <i>Vanellus vanellus</i> , yellowhammer <i>Emberiza citronella</i> , reed bunting <i>Emberiza schoeniclus</i> , linnet <i>Linaria cannabina</i> , and yellow wagtail <i>Motacilla flava</i> .
Coke's Pit Lake LNR	1,250 west	An area of open water with shingle islands, reedswamp, grassland and hedgerows. Bird species include tufted duck <i>Aythya fuligula</i> , common tern <i>Sterna hirundo</i> and reed bunting <i>Emberiza schoeniclus</i> .

There are also twelve Local Wildlife Sites within 2km of the Site, comprising:

- Cotswold Water Park Pit 62 LWS;
- Cotswold Water Park Pit 26 LWS;
- Cotswold Water Park Lakes 84 and 85 Shorncote Reedbed LWS;
- Cotswold Water Park Pit 27 LWS;
- Cotswold Water Park Pits 28, 28a, 29, 30, 35, 38 LWS;
- Cotswold Water Park Pit 32 LWS;
- River Churn LWS;
- Clayhill Field LWS;
- Cotswold Water Park Pit 37 LWS;

- Cotswold Water Park Pit 96 LWS;
- Cotswold Water Park Pits 39, 40, 64, 70, 92, 93, 94 LWS; and,
- Cotswold Water Park Pits 25, 66, 69, 76 & 200 LWS.

Local Wildlife Sites associated with Cotswold Water Park will be considered in conjunction with Cotswold Water Park SSSI. Those sites which reference bird species in their citations are detailed below in Table 4-2:

Table 4-4-2
Non-Statutory Sites within 5km of the Site Boundary

Site Name	Distance (m) from Site	Site Description
Cotswold Water Park Lakes 84 and 85 Shorncote Reedbed Local Wildlife Site	662 north-west	A series of lakes, gravel pits and reservoirs with reedbed and bird assemblages. The site also contains connecting habitats of rough grassland with deep ditches. The reedbeds support a diverse bird assemblage including reed bunting <i>Emberiza schoeniclus</i> , reed warbler <i>Acrocephalus scirpaceus</i> , little grebe <i>Tachybaptus ruficollis</i> , snipe <i>Gallinago gallinago</i> , otter <i>Lutra lutra</i> , water vole <i>Arvicola amphibius</i> and bittern <i>Botaurus stellaris</i> . The site is also important for various species of dragonfly.
Cotswold Water Park Pits 39, 40, 64, 70, 92, 93, 94 Local Wildlife Site	1,770 south	A large group of lakes, quarries and grassland with some bird interest.

4.2 Winter Bird Survey

A list of all BoCC, Schedule 1, S41 and raptor species recorded on Site, with an evaluation to the species status within Wiltshire, based on information acquired from The Wiltshire List (Wiltshire Ornithological society, 2020⁸), can be found in Table 4-1 below. A full list of all species recorded on Site (along with corresponding BTO codes) can be found in Appendix 3.

Table 4-2
Winter Bird Survey Results

Species	Conservation Status	Summary of Records	County Status
Woodpigeon (<i>Columba palumbus</i>)	Amber	Recorded across all survey visits, with a peak count of 55 during the February survey.	Widespread and common resident.
Lapwing (<i>Vanellus vanellus</i>)	Red	Two birds recorded in the southern field during the January visit.	Common winter visitor, decreasing breeder.
Black-Headed Gull (<i>Chroicocephalus ridibundus</i>)	Amber	A single bird recorded overflying the site during the December, January, and February visits.	Common gull which is declining in recent years.
Buzzard (<i>Buteo buteo</i>)	Green	Individual buzzards were recorded during the February and November visits. One bird was observed perched along the treeline on the western boundary and the other was circling above the northern field.	Commonest raptor, increasing in recent years.
Wren (<i>Troglodytes troglodytes</i>)	Amber	Recorded during all but the November visit. These birds were located in the central hedgerow and at site boundaries.	Common resident, declining in recent years.

⁸ [Wiltshire List - Wiltshire Ornithological Society | Records \(wiltshirebirds.co.uk\)](https://wiltshirebirds.co.uk/) Accessed: 24/07/2023

Species	Conservation Status	Summary of Records	County Status
Starling (<i>Sturnus vulgaris</i>)	Red	Recorded across all visits, with a peak count of 35 observations during the November visit, located in the central hedgerow and at site boundaries.	Seriously decreasing resident.
Song Thrush (<i>Turdus philomelos</i>)	Amber	One song thrush was recorded during the January visit, located along the northern site boundary.	Common resident and winter visitor. Declining in recent years.
Dunnock (<i>Prunella modularis</i>)	Amber, S41	Recorded during the December, January and February visits, with a peak count of five birds during the December survey.	Common bird in Wiltshire, recently facing declines in Britain as a whole.
Meadow Pipit (<i>Anthus pratensis</i>)	Amber	Recorded during the January and February surveys, with a peak count of 20 birds during the February survey.	Common in Wiltshire as both a resident and winter visitor.
Bullfinch (<i>Pyrrhula pyrrhula</i>)	Amber	Four bullfinches were recorded during the February survey, using the site boundaries.	Moderately common resident.

4.3 Breeding Bird Survey

A list of all BoCC, Schedule 1, S41 and raptor species recorded on Site, with an evaluation to the breeding status on Site and within Wiltshire, can be found in Table 4-3 below. A full list of all species recorded on Site during the breeding bird surveys (along with corresponding BTO codes) can be found in Appendix 4.

Table 4-3
Breeding Bird Survey Results

Species	Conservation Status	Summary of Records	Breeding Status (Where assessment Possible)	County Status
Greylag goose (<i>Anser anser</i>)	Amber	Recorded overflying the site during all surveys, with a peak count of three birds flying west to east during the July survey.	Non-breeding.	Common summer resident in Wiltshire.
Mallard (<i>Anas platyrhynchos</i>)	Amber	Mallards were recorded during the April and June surveys. These birds were observed in the northern field with a peak count of ten birds recorded simultaneously during the June survey.	Possible breeder.	Common resident breeder.
Woodpigeon (<i>Columba palumbus</i>)	Amber	Woodpigeons were recorded across all surveys, with a peak count of seven observations during the June survey.	Probable breeder.	Widespread and common resident.
Lesser black-backed gull (<i>Larus fuscus</i>)	Amber	Single lesser black-backed gulls were observed overflying the site during the April, May and June surveys.	Non-breeding	Very common gull declining in recent years.

Species	Conservation Status	Summary of Records	Breeding Status (Where assessment Possible)	County Status
Buzzard (<i>Buteo buteo</i>)	Green	Buzzards were recorded during all but the July survey, with a pair confirmed to be nesting along the western site boundary.	Confirmed breeder.	Commonest raptor, increasing in recent years.
Skylark (<i>Alauda arvensis</i>)	Section 41, Red	Skylarks were recorded in low numbers during the March, April and July surveys, with a peak count of two birds recorded singing during the April survey. These birds were recorded in both fields on site and adjacent to the site to the west.	Possible breeder.	Common resident which has recently declined.
Whitethroat (<i>Sylvia communis</i>)	Amber	Single whitethroats were recorded during the May and July surveys. These observations were made in the central hedgerow and along the eastern site boundary.	Probable breeder.	Common summer visitor declining in recent years.
Wren (<i>Troglodytes troglodytes</i>)	Amber	Wrens were located across all survey visits, with a peak count of seven observations during the May and July surveys. These birds were recorded across the central hedgerow and the site boundaries.	Probable breeder.	Abundant across Wiltshire, though suffering declines in recent years.

Species	Conservation Status	Summary of Records	Breeding Status (Where assessment Possible)	County Status
Dunnock (<i>Prunella modularis</i>)	Section 41, Amber	Dunnocks were recorded during the March, June and July survey visits, with a peak count of two observations during the July survey. These birds were seen along the site boundaries.	Probable breeder.	Common bird in Wiltshire, recently facing declines.
Linnet (<i>Carduelis cannabina</i>)	Red	One linnet was recorded during the July survey, located in the southern field.	Possible breeder.	Decreasing resident in Wiltshire.

4.4 Incidental Records

Lapwing were heard calling in the southern portion of the site during a bat survey on 23rd August 2023. Due to the low light conditions, the exact number of birds present could not be determined. A tawny owl (*Strix aluco*) was also heard calling in the southern portion of the site during bat surveys on 27th July, 10th August and 23rd August 2023.

5.0 Discussion

The bird species recorded on the Site represent a reasonably typical farmland assemblage for this area of Wiltshire. Most of the species recorded are common species, however the Site also supports a modest number of species of conservation concern. Four red list species were recorded on the Site during the surveys, specifically lapwing, starling, skylark, linnet, which are discussed further in the below sections.

Ten amber list species were recorded around the Site during the survey visits, namely greylag goose, mallard, woodpigeon, black-headed gull, lesser black-backed gull, whitethroat, wren, song thrush and dunnock. During the bat surveys, an incidental record of amber list species, tawny owl, was also recorded. The numbers of these species recorded on the Site were considered to be of no more than local significance.

One raptor species was recorded during the surveys - common buzzard. This species is common in the area, and the numbers recorded were of no more than local significance.

5.1 Species Associated with Statutory Sites

Breeding species named in the SSSI and LNR citations (which therefore form part of the breeding assemblage special interest) whose populations are likely to, or are known to, extend outside the SSSI are detailed below. No records of the SSSI and LNR species yellowhammer, reed bunting, yellow wagtail, green sandpiper, common gull, herring gull, tufted duck, common tern or reed bunting were made during the surveys. The SSSI is also designated for its non-breeding waterbird assemblage, no other waterbirds were recorded on site during the winter bird surveys.

Lapwing

During the winter bird survey, two lapwings were recorded in the southern field (refer to Appendix 1), likely using the ploughed field for foraging. No lapwings were recorded during the breeding bird survey, however incidental summer records of lapwing were recorded during a bat survey on 23rd August, using the southern field as identified in the winter survey.

In the winter, lapwings are often found in farmland habitats where they flock on pasture and ploughed fields. Breeding lapwings typically inhabit farmland with significant areas of lowland wet grassland and meadow which provide the right foraging habitats with soft soil for precocial chicks (Johansson and Blomqvist, 1996⁹; Krolukowska et al., 2016¹⁰). During the breeding bird surveys, no lapwings were recorded and as such no breeding behaviour (such as scrape forming, tumbling display or alarm calling (Ferguson Lees *et al.* 2011¹¹) was recorded. In conjunction with the late date in the breeding season of the incidental record (August), it is considered unlikely that lapwing use the site for breeding. Rather, the space offers a resource for low numbers of foraging lapwing post breeding (on passage) and during the winter.

The fields on site are to be lost to facilitate the proposed development, it will therefore be necessary to create compensatory habitat. Habitat creation in the form of species-rich wet grassland is proposed on site, and discussion with the applicant has identified further landholding in the locality, shown in Appendix 5. Due to the low numbers of lapwing recorded on site, a like-for-like approach is proposed, where fields within the

⁹ Johansson, O.C. and Blomqvist, D. (1996) Habitat Selection and Diet of Lapwing *Vanellus vanellus* Chicks on Coastal Farmland in S.W. Sweden. *Journal of Applied Ecology*, 33, pp.1030-1040.

¹⁰ Krolukowska N., Szymkowiak J., Laidlaw R.A. and Kuczynski L. (2016) Threat sensitive anti-predator defence in precocial wader, the northern lapwing *Vanellus vanellus*. *Acta Ethologica*, 19, pp.163-171.

¹¹ Ferguson-Lees J., Castell R., Leech D. (2011) *A Field Guide to Monitoring Nests*. Thetford: British Trust for Ornithology

landholding identified in Appendix 5 will be managed to benefit lapwing and a number of other species as detailed below, on a rotational basis to fit with the farming schedule. Each year, a compensatory area within the landholding (measuring at least 7 ha replace the area lost) will be managed as arable, but should be ploughed or harrowed (depending on cropping regime) and left bare in the winter to benefit foraging lapwing.

Linnet

One linnet was recorded during the July breeding bird survey, located in the southern field on site (refer to Appendix 2). Linnet utilise a variety of habitats during the breeding season but usually show a preference for dense thorny bushes or hedges (Ferguson Lees *et al.* 2011). The central hedgerow on site is to be completely removed, and the hedgerow along the eastern boundary is to be cut back to accommodate visibility splay. Under the current landscape plan for the site, compensation is to be completed, in the form of native hedgerow infill throughout the site. Management of existing hedgerows, both on site and in offsite areas as shown in Appendix 5, to form an “A-shape” would also increase invertebrate diversity and be beneficial for linnet and other farmland birds such as reed bunting and yellowhammer (The Wildlife Trusts, no date¹²).

Lesser black-backed gull

Single lesser black-backed gulls were observed overflying the site during the April, May and June breeding bird surveys (refer to Appendix 2). This species nests on cliffs or buildings and no such habitat is present on site. It is therefore considered unlikely that the Site represents a significant resource for breeding lesser black-backed gulls. Habitat in the vicinity such as the Cotswold Water Park provides more suitable habitat, and it is likely that the gulls recorded were associated with the Park.

Black-headed gull

Single black-headed gulls were observed overflying the site during the December, January and February winter bird surveys (refer to Appendix 1). During the winter, black-headed gulls will utilise a variety of habitats, though farmland offers limited foraging opportunities unless immediately after ploughing or after heavy rain when food sources are more readily available (Vernon, 1972¹³). It is therefore considered that the Site offers an occasional foraging resource for winter black-headed gulls. As recommended for lapwing, an off-site field provision, as identified in Appendix 5, which is ploughed or harrowed and left bare in the winter should benefit this species.

5.2 Species Associated with Non-Statutory Sites

Two Local Wildlife Sites with bird species mentioned in their citations were provided by the desk study search. These sites comprised Cotswold Water Park Lakes 84 and 85 Shorncote Reedbed LWS and Cotswold Water Park Pits 39, 40, 64, 70, 92, 93, 94 LWS. The species mentioned in the citations are assemblages typically associated with freshwater and marginal freshwater habitats, namely reed bunting, reed warbler, little grebe and snipe. The site does not contain any water features and none of these species were recorded on site during the surveys.

5.3 Red List Species

Lapwing and linnet are discussed above in Section 5.1. The remaining Red List species recorded on site during the surveys are discussed below.

Starling

Numerous starlings were recorded during the winter bird surveys, with a peak count of approximately 50 birds in one flock (refer to Appendix 1). No starlings were recorded during the breeding bird surveys. Starlings are

¹² [How to manage a hedgerow for wildlife | The Wildlife Trusts](#) (Accessed on 31/08/2023).

¹³ Vernon, J.D.R (1972) Feeding Habitats and Food of the Black-headed and Common Gulls. Part 2 – Food, Bird Study, 19(4), pp.173-186.

abundant in southern England, and in the winter will flock in large roosts. In farmland habitats, this species will feed on ground-dwelling invertebrates found most frequently in pasture fields and less frequently in arable fields as found on Site. The introduction of areas of grassland would benefit foraging starlings in the winter. Habitat creation in the form of neutral wet grassland is already proposed on Site. Within the offsite area identified in Appendix 5 and described with regards to lapwing, wide set aside margins should be created (measuring approximately 6m), to benefit starling as well as a range of other winter and breeding bird species.

Skylark

Skylarks were identified in low numbers during the March, April and July breeding bird surveys (refer to Appendix 2), with a peak count of two singing birds recorded during the April survey. Skylarks utilise a variety of farmland and grassland habitats for breeding. Provision for skylark will be provided in the form of skylark plots, two hundred of which should be created per square kilometre (RSPB, no date¹⁴). The compensatory area of habitat created, as identified in Appendix 5, measures approximately 0.07km² and as such fourteen skylark plots should be created, measuring a minimum of 16m² in area and 3m wide. Full management specifications will be detailed in an Ecological Management Plan (EMP).

5.4 Amber List Species

Greylag goose

During all breeding bird surveys, greylag geese were observed overflying the site. This species has a habitat preference for gravel pits, lakes and reservoirs. These habitats are not present on site and greylag geese were only observed overflying the Site (which is surrounded by suitable habitat in the form of Cotswold Water Park) during the surveys. It is considered unlikely that the Site offers a significant resource for breeding greylag geese.

Mallard

Mallards were recorded during the April and June surveys, with a peak count of ten birds recorded in the northern field (refer to Appendix 5). In the breeding season, mallard usually breed in riparian vegetation or in tree hollows adjacent to water but will sometimes breed 2-3km away from water (Ferguson-Lees *et al.* 2011). Given the proximity of nearby lakes (the closest of which is located 380m south of the site boundary), it is possible that this species uses the site for breeding. Habitat creation in the form of neutral wet grassland is specified under the landscape plan for the Site which should benefit this species, wide set aside margins as proposed above should also provide cover and safety for breeding mallards.

Woodpigeon

Woodpigeons were recorded across all surveys. In the winter, woodpigeon will feed in arable fields containing winter stubble. Breeding woodpigeons will utilise a variety of trees and bushes. The arable habitat and central hedgerow on site are to be lost to facilitate the proposed biodigester, meaning that woodpigeons will lose both suitable breeding and foraging habitat. As discussed above, it will be necessary to create compensatory habitat. The field described for lapwing and identified in Appendix 5 will also benefit woodpigeon. In addition, management of existing hedgerows, on site and in the offsite location identified in Appendix 5, to form an “A-shape” would also be beneficial for woodpigeon.

Wren, song thrush, dunnock and bullfinch

During the winter bird surveys, wren, song thrush, dunnock and bullfinch were observed using the central hedgerow and also the boundary hedgerows, and trees (refer to Appendix 1). Wren and dunnock were also recorded during the breeding bird surveys, using the same habitats (refer to Appendix 2). These species utilise a

¹⁴ [Skylark plots | Advice For Farmers - The RSPB](#) (Accessed on 20/07/2023).

range of habitats in the winter but favour deciduous woodland and hedgerows. For breeding, wren and dunnoek favour hedgerows.

Under current plans, the central hedgerow on Site is to be lost, and the hedgerow along the eastern boundary is to be cut back to accommodate visibility splay. As described above, under the current landscape plan, hedgerow infill is to be completed throughout the site. Management of existing hedgerows, on site and in the offsite location identified in Appendix 5, to form an "A-shape" would also be beneficial for all farmland birds.

Whitethroat

Single whitethroats were recorded during the May and July surveys (refer to Appendix 2). These observations were made in the central hedgerow and along the eastern site boundary. Whitethroat show a breeding habitat preference for low scrub or rough grassland. Habitat creation in the form of neutral wet grassland is proposed on site under the Landscape Plan, which should benefit this species. Wide set aside margins and hedgerow management as proposed above will also provide suitable habitat for whitethroat.

Meadow pipit

Flocks of meadow pipit were observed during the January and February survey (refer to Appendix 1), with a peak count of approximately 20 birds, observed in the southern field. Meadow pipit have a habitat preference for agricultural land and marshes in the winter. As the agricultural land on site is to be lost to facilitate the proposed development, replacement farmland will be managed in a way to benefit birds, as described above and shown in Appendix 5.

Tawny owl

Incidental records of tawny owl were recorded calling in the southern portion of the site during bat surveys on 27th July, 10th August and 23rd August 2023. It is thought that this bird was located in the line of trees just outside the site boundary to the south-west, though the exact location could not be determined due to low light conditions. The mature trees in this portion of the site are to be retained and as such nesting tawny owls will not be impacted by the proposed work. Native tree and shrub planting is proposed along the southern portion of the site boundary which will benefit tawny owl in the long term. However, the line of the trees located immediately south-west should not be subject to increased lighting.

If the management as described above of offsite habitat (as identified in Appendix 5), comprising hedgerow management and creation of wide set aside margins, should offer more habitat for tawny owl prey such as mice, voles and shrews.

5.5 Conclusion

During the surveys, species associated with the nearby SSSI and LNR, lapwing, linnet, lesser black-backed gull and black-headed gull were recorded on site. No species associated with non-statutory sites were recorded. The following red list species were recorded on site, starling and skylark. As were the following amber list species: greylag goose, mallard, woodpigeon, wren, song thrush, dunnock, bullfinch, whitethroat, meadow pipit and tawny owl.

Overall, the assemblage of birds on Site was typical of farmland habitats and the species of conservation concern described above were only recorded in modest numbers. The nearby SSSI - the Cotswold Water Park, comprises predominantly breeding birds of open water and as there are no such habitats on site it is considered unlikely that large numbers of birds from the SSSI would utilise the Site. The only species recorded on Site which is associated with the SSSI comprised low numbers of foraging lapwing. Due to the presence of key species of conservation concern, enhancements should be incorporated into the scheme for the site as follows:

- Compensatory habitat off-site for lapwing (which will also benefit black-headed gull, meadow pipit and other farmland birds). This should comprise an area measuring at least 7 ha in the landholding identified in Appendix 5, which will be managed as arable, but should be ploughed or harrowed (depending on cropping regime) and left bare in the winter to benefit foraging lapwing.
- Management of existing hedgerows, both on-site and offsite in the landholding identified in Appendix 5, to form an “A-shape” would also increase invertebrate diversity and be beneficial for linnet, woodpigeon, wren, song thrush, dunnock, bullfinch and other farmland birds such as reed bunting and yellowhammer.
- Fourteen skylark plots should be created in the off-site landholding identified in Appendix 5, measuring a minimum of 16m² in area and 3m wide.
- Within the offsite area identified in Appendix 5, wide set aside margins should be created (measuring approximately 6m), to benefit starling as well as a range of other winter and breeding bird species.

APPENDIX 1:

Winter Bird Survey Results Drawings



LEGEND

Site Boundary

Directional Flight Line

xx Species of Conservation Concern
Amber List

xx Species of Conservation Concern
Amber List

BTO Behaviour Symbol

Calling

BTO Species Codes

B. - Blackbird
BH - Black-Headed Gull
C. - Carrion Crow
D. - Dunnock
LT - Long-tailed Tit
SG - Starling
WP - Woodpigeon
WR - Wren

4/5 LOCHSIDE VIEW
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ASHTON KEYNES

WINTER BIRD SURVEY RESULTS

11/11/2022

FIGURE 1.1

Scale
1:2,000 @ A3

Date
AUGUST 2023



LEGEND

Site Boundary

Directional Flight Line

xx Species of Conservation Concern
Amber List

xx Species of Conservation Concern
Amber List

BTO Behaviour Symbol

Calling

Alarm Call

BTO Species Codes

B. - Blackbird

BZ - Buzzard

C. - Carrion Crow

D. - Dunnock

L. - Lapwing

LT - Long-tailed Tit

MG - Magpie

R. - Robin

SG - Starling

WP - Woodpigeon

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ASHTON KEYNES

WINTER BIRD SURVEY RESULTS

16/12/2022

FIGURE 1.2

Scale
1:2,000 @ A3

Date
AUGUST 2023

11923.00002.0143.0 Winter Bird Survey Results



LEGEND

Site Boundary

→ Directional Flight Line

xx Species of Conservation Concern
Amber List

xx Species of Conservation Concern
Amber List

BTO Behaviour Symbol

— Calling

= Alarm Call

BTO Species Codes

B. - Blackbird	MG - Magpie
BF - Bullfinch	MP - Meadow Pipit
BJ - BlackTern	PH - Pheasant
BT - Blue Tit	R. - Robin
BZ - Buzzard	SG - Starling
C. - Carrion Crow	ST - Song Thrush
GO - Goldfinch	WP - Woodpigeon
GT - Great Tit	WR - Wren
JD - Jackdaw	
L. - Lapwing	

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ASHTON KEYNES

WINTER BIRD SURVEY RESULTS

04/01/2023

FIGURE 1.3

Scale1:2,000 @ A3

DateAUGUST 2023



LEGEND

Site Boundary

Directional Flight Line

xx Species of Conservation Concern
Amber List

xx Species of Conservation Concern
Amber List

BTO Behaviour Symbol

 Singing

Alarm Call

BTO Species Codes

BH - Black-Headed Gull

BF - Bullfinch

BT - Blue Tit

BZ - Buzzard

C. - Carrion Crow

GO - Goldfinch

GT - Great Tit

JD - Jackdaw

MP - Meadow Pipit

PH - Pheasant

R. - Robin

SG - Starling

WP - Woodpigeon

WR - Wren

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ASHTON KEYNES

WINTER BIRD SURVEY RESULTS

07/02/2023

FIGURE 1.4

Scale1:2,000 @ A3

DateAUGUST 2023

11923.00002.0143.0 Winter Bird Survey Results

APPENDIX 2

Breeding Bird Survey Results Drawings



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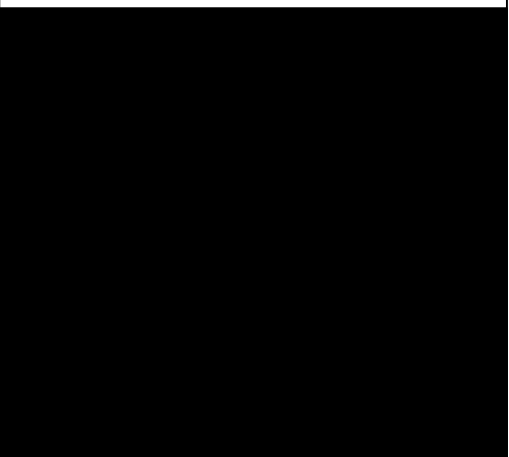
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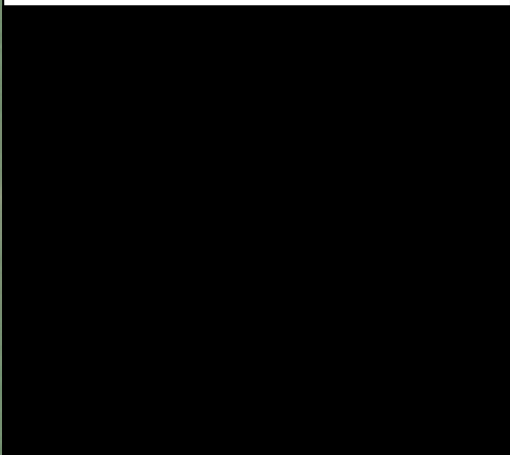
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APPENDIX 3

Full List of Bird Species Recorded – Winter Bird Surveys

Species	Conservation Status	Summary of Records	BTO Code
Canada goose (<i>Branta canadensis</i>)	Green	A flock of 30 Canada geese was observed adjacent to the site during the November survey, to the north-west.	CG
Pheasant (<i>Phasianus colchicus</i>)	Green	A single pheasant was recorded during the February survey.	PH
Woodpigeon (<i>Columba palumbus</i>)	Amber	Recorded across all survey visits, with a peak count of 55 during the February survey.	WP
Lapwing (<i>Vanellus vanellus</i>)	Red	Two birds recorded in the southern field during the January visit.	L.
Black-Headed Gull (<i>Chroicocephalus ridibundus</i>)	Amber	A single bird recorded overflying the site during the December, January, and February visits.	BH
Buzzard (<i>Buteo buteo</i>)	Green	Individual buzzards were recorded circling above the site during the February and November visits.	BZ
Magpie (<i>Pica pica</i>)	Green	One magpie was observed during the November survey, located along the northern boundary of the site.	MG
Jackdaw (<i>Corvus monedula</i>)	Green	Four jackdaws were observed during the February survey.	JD
Carrion crow (<i>Corvus corone</i>)	Green	Carrion crows were observed during every survey, with a peak count of nine observations during the January survey.	C.
Blue tit (<i>Cyanistes caeruleus</i>)	Green	Blue tits were observed in all but the December surveys, located along site boundaries with a peak count of five birds.	BT
Long-tailed tit (<i>Aegithalos caudatus</i>)	Green	Long-tailed tits were observed during the November and December surveys, with a peak count of five observations during the November survey, located along the site boundaries.	LT
Wren (<i>Troglodytes troglodytes</i>)	Amber	Recorded during all but the November visit, with a peak count of 16 during the January visit. These birds were located in the central hedgerow and at site boundaries.	WR
Starling (<i>Sturnus vulgaris</i>)	Red	Recorded across all visits, with a peak count of 50 observations during the January and November visits, located in the central hedgerow and at site boundaries.	SG
Song Thrush (<i>Turdus philomelos</i>)	Amber	One song thrush was recorded during the January visit, located along the northern site boundary.	ST
Blackbird (<i>Turdus merula</i>)	Green	Recorded during all but the February survey, with a peak count of seven observations during the December survey.	B.
Robin (<i>Erithacus rubecula</i>)	Green	Recorded during all but the December survey, with a peak count of three observations during the February survey.	R.

Species	Conservation Status	Summary of Records	BTO Code
Dunnoek (<i>Prunella modularis</i>)	Amber, S41	Recorded during the December, January and February visits, with a peak count of five birds during the December survey.	D.
Meadow Pipit (<i>Anthus pratensis</i>)	Amber	Recorded during the January and February surveys, with a peak count of 20 during the February survey.	MP
Bullfinch (<i>Pyrrhula pyrrhula</i>)	Amber	Four bullfinches were recorded during the February survey.	BF
Goldfinch (<i>Carduelis carduelis</i>)	Green	Six observations were made of goldfinch during the December survey, located along the northern boundary of the site, and eight located just off site during the February survey.	GO

APPENDIX 4

Full List of Bird Species Recorded – Breeding Bird Surveys

Species	Conservation Status	Summary of Records	BTO Code
Canada goose (<i>Branta canadensis</i>)	Green	Canada geese were recorded overflying the site during the March, April and May surveys.	CG
Greylag goose (<i>Anser anser</i>)	Amber	Recorded overflying the site during all surveys, with a peak count of three birds flying west to east during the July survey.	GJ
Mallard (<i>Anas platyrhynchos</i>)	Amber	Mallards were recorded during the April and June surveys. These birds were observed in the northern field.	MA
Pheasant (<i>Phasianus colchicus</i>)	Green	A single pheasant was recorded during the February survey.	PH
Woodpigeon (<i>Columba palumbus</i>)	Amber	Woodpigeons were recorded across all surveys, with a peak count of seven observations during the June survey.	WP
Lesser Black Backed Gull (<i>Larus fuscus</i>)	Amber	Single lesser black-backed gulls were observed overflying the site during the April, May and June surveys.	LB
Cormorant (<i>Phalacrocorax carbo</i>)	Green	Single cormorants were observed overflying the site during the March and April surveys.	CA
Grey heron (<i>Ardea cinerea</i>)	Green	A grey heron was observed overflying the site during the March survey.	H.
Buzzard (<i>Buteo buteo</i>)	Green	Buzzards were recorded during all but the July survey, with a pair confirmed to be nesting along the western site boundary.	BZ
Great spotted woodpecker (<i>Dendrocopos major</i>)	Green	A great spotted woodpecker was observed during the July survey, located in the western site boundary.	GS
Jackdaw (<i>Corvus monedula</i>)	Green	Jackdaws were recorded in low numbers during every survey.	JD
Carrion crow (<i>Corvus corone</i>)	Green	Carrion crows were recorded in low numbers during all but the June survey.	C.
Blue tit (<i>Cyanistes caeruleus</i>)	Green	Blue tits were recorded during the March, April and May surveys, with a peak count of 6 during the April survey.	BT
Great tit (<i>Parus major</i>)	Green	Great tits were observed in low numbers during all but the June survey.	GT
Skylark (<i>Alauda arvensis</i>)	Section 41, Red	Skylarks were recorded in low numbers during the March, April and July surveys. These birds were recorded in the northern field and adjacent to the site to the west.	S.
Chiffchaff (<i>Phylloscopus collybita</i>)	Green	One chiffchaff was recorded during the March survey, located in the central hedgerow.	CC
Blackcap (<i>Sylvia atricapilla</i>)	Green	One blackcap was recorded during the May survey, located on the eastern site boundary.	BC

Species	Conservation Status	Summary of Records	BTO Code
Whitethroat (<i>Sylvia communis</i>)	Amber	Single whitethroats were recorded during the May and July surveys. These observations were made in the central hedgerow and along the eastern site boundary.	WH
Wren (<i>Troglodytes troglodytes</i>)	Amber	Wrens were located across all survey visits, with a peak count of seven observations during the May and July surveys. These birds were recorded across the central hedgerow and the site boundaries.	WR
Blackbird (<i>Turdus merula</i>)	Green	Blackbirds were recorded during all but the March survey, with a peak count of three observations during the May survey.	B.
Robin (<i>Erithacus rubecula</i>)	Green	Robins were recorded during all but the April survey, with a peak count of two birds during the May survey.	R.
Dunnock (<i>Prunella modularis</i>)	Section 41, Amber	Dunnocks were recorded during the March, June and July survey visits, with a peak count of two observations during the July survey. These birds were seen along the site boundaries.	D.
Chaffinch (<i>Fringilla coelebs</i>)	Green	Low numbers of chaffinches were seen during the March, April and May surveys.	CH
Linnet (<i>Carduelis cannabina</i>)	Red	One linnet was recorded during the July survey, located in the southern field.	LI
Goldfinch (<i>Carduelis carduelis</i>)	Green	Individual goldfinches were recorded during the April and May surveys.	GO



APPENDIX 5:

Land Within Client Ownership



LEGEND

-  Site Boundary
-  Land Within the Applicant's Control
-  Local Authority Boundary



 4/5 LOCHSIDE VIEW
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ASHTON KEYNES, WILTSHIRE

PLANNING APPLICATION

SITE CONTEXT

AKE - 0001

Scale	1:5,000	@ A3	Date	MARCH 2023
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SHEFFIELD

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SHREWSBURY

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STAFFORD

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APPENDIX 04

Bat Survey Report

PROPOSED ANAEROBIC DIGESTION FACILITY AT ASHTON KEYNES

Appendix 4: Bat Survey Report
Prepared for: Acorn Bioenergy

SLR Ref: 404.11923.00004
Version No: Final
October 2023



BASIS OF REPORT

This document has been prepared by SLR with reasonable skill, care and diligence, and taking account of the manpower, timescales and resources devoted to it by agreement with Acorn Bioenergy (the Client) as part or all of the services it has been appointed by the Client to carry out. It is subject to the terms and conditions of that appointment.

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DRAWINGS

DRAWING 1 – BAT SURVEY RESULTS

1.0 Introduction

1.1 Background

In April 2023, SLR Consulting Limited was commissioned by Acorn Bioenergy to undertake bat surveys of three trees to be pruned on land earmarked for development, located north of Ashton Keynes. The trees are located outside of the development site boundary and are located adjacent to Ashton Road. It is understood that the trees are to be removed for traffic visibility reasons.

The Site falls within the administrative boundary of Wiltshire County Council and is centred on National Grid Reference SU 04013 96085. This document, a Bat Survey Report, details the findings of bat surveys undertaken at the Site in July and August 2023 and assesses the potential for ecological impacts to occur should the proposed development be consented. The assessments have been based on the current guidelines published by the Bat Conservation Trust¹.

1.2 Site Location & Description

The application site, (the Site) consists of a broadly rectangular area of arable land and comprises one full field and the adjoining northern part of a second field situated immediately to the south. Both the fields are in arable use, there is an intermittent hedgerow and low trees that dissects the two fields, a shallow drainage ditch also lies on the northern side of this divide.

The site falls entirely within the administrative boundary of Wiltshire County Council and is situated on the eastern portion of Ashton Down. It is bordered by mature trees and hedgerows on all sides bar the southern section where it bisects the southern boundary.

The site itself is surrounded by flat, open, arable fields with shallow drainage ditches present outside the northern and eastern boundaries. An unsurfaced access track runs along the western boundary, likewise Ashton Road runs along the site to the east.

Beyond Ashton Road, to the east, is a previous historic landfill site, that has been restored to pasture. To the south-east is an Aggregate Industries concrete works. The Site and survey boundaries can be seen on Drawing 1.

1.3 Purpose of this Report

This report addresses potential occupation of bats within the proposed development. In summary, the purpose of this bat survey report is to:

- Describe the baseline data collection and assessment methodologies used;
- Assess the bat roost potential of the trees to be removed on site;
- Identify, if required, how licensing, mitigation, and enhancement measures will be delivered; and
- Provide an assessment of the significance of any residual effects on biodiversity and the legal and policy implications.

¹ Collins, J. (ed.) (2016) Bat Surveys for Professional Ecologists: Good Practice Guidelines (3rd edn). The Bat Conservation Trust, London

1.4 Evidence of Technical Competence and Experience

Giselle Hynes, who undertook the Preliminary Roost Assessment, bat surveys and wrote this report, has a Master's degree in Wildlife Management and Conservation and is a Qualifying Member of CIEEM. Giselle is a Senior Ecologist at SLR and has over 4 years' experience in ecological consultancy and has undertaken numerous bat surveys and ecological assessments.

Emma Smith, who undertook the bat surveys, is a Senior Field Ecologist at SLR. Emma is experienced in a range of survey techniques, including protected species surveys including badger, great crested newt, bats, dormouse, water vole and reptiles. Emma has a BSc (Hons) degree in Geography from the University of Plymouth.

Sarah Fletcher, who undertook the bat surveys, has a BSc and MSc in Applied Wildlife Conservation, and is an Assistant Ecologist with SLR. Sarah Fletcher has approximately two years' experience as a professional ecologist, undertaking protected species survey, including badgers, bats, and great crested newts.

This report has been subject to Quality Assurance review as per SLR's policies by Dale Broadbent BSc (hons) MCIEEM. Dale has 15 years' experience as a professional ecologist, during which time he has worked on many development projects. Dale also holds a Natural England Level 2 Survey Licence for bats and is registered to use the Bat Mitigation Class License (formerly Bat Low Impact Class License).

1.5 Relevant Legislation and Policy

Bats

All native UK species of bat are listed on Annex II and IV of the EEC Directive on the Conservation of Natural Habitats and Wild Fauna and Flora. This Directive is transposed into UK law through The Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019. All bats are also listed on Schedule 5 of Wildlife & Countryside Act 1981 (as amended) and are afforded further protection under Section 9 of this Act. This legislation makes it offence to:

- deliberately kill, injure or take a bat;
- deliberately disturb a bat or bats in such a way as to be likely to impair their ability to survive, breed, or rear or nurture their young;
- to hibernate or migrate; or to affect significantly the local distribution or abundance of that species;
- damage or destroy the breeding or resting place of a bat;
- intentionally or recklessly obstruct access to a place that bats use for shelter or protection; and
- intentionally or recklessly disturb a bat whilst it is occupying a place which it uses for shelter or protection.

The Natural Environment and Rural Communities Act 2006 places a duty on authorities to have due regard for biodiversity and nature conservation during the course of their operations. Section 41 of this document requires the Secretary of State to publish a list of species of flora and fauna and habitats considered to be of principal importance for the purpose of conserving biodiversity. The list, a result of the most comprehensive analysis ever undertaken in the UK, currently contains 1,149 species, including for example, hedgehog *Erinaceus europaeus*, and 65 habitats that were listed as priorities for conservation action under the now defunct UK Biodiversity Action Plan (UK BAP). This list includes the following bat species:

- Barbastelle *Barbastella barbastellus*;
- Bechstein's *Myotis bechsteinii*;

- Soprano pipistrelle *Pipistrellus pygmaeus*;
- Brown long-eared bat *Plecotus auritus*;
- Greater horseshoe bat *Rhinolophus ferrumequinum*; and
- Lesser horseshoe bat *Rhinolophus hipposideros*.

A Mitigation Licence may be required for any activity which will damage, destroy or obstruct access to bat roost or disturb a bat whilst it is occupying a roost.

2.0 Methodology

The methods used during each survey are in accordance with the Bat Conservation Trust (2016) Bat Survey for Professional Ecologists Good Practice Guidelines (3rd Edition)² unless stated otherwise.

2.1 Baseline Data Collection

2.1.1 Desk Study

A desktop study has been undertaken to determine the scope of the existing ecological knowledge and data relating to the site and surrounding area using the following resources:

- Multi-Agency Geographic Information for the Countryside (MAGIC) website – for statutory designated sites in relation to bats and European protected species licences within 2km of the Site;
- Gloucestershire Centre for Environmental Records (GCER) and Wiltshire and Swindon Biological Records Centre (SBRC), (the local biological records centres) – for protected species records and local designated sites records within 2km of the Site; and

2.2 Preliminary Roost Assessment of Trees

2.2.1 Ground Based Assessment for Bat Roosts

A daytime visit was made on 27th July 2023 to evaluate the potential for bats to use the trees identified on Drawing 1. Each tree was inspected on all accessible aspects using high-powered binoculars and torches to identify and record features that may be used by bats for roosting, known as Potential Roost Features (PRFs). Bats are known to roost in tree holes, cracks, splits and other fissures; behind loose bark and epiphytic growth. Trees were assessed as having negligible, low, moderate or high potential to support bats as follows (in accordance with BCT (2016):

- Negligible: Negligible habitat features likely to be used by roosting bats.
- Low: A tree of sufficient size and age to contain PRFs but with only very limited roosting potential.
- Moderate: A tree with one or more PRFs that could be used by bats due to their size, shelter, protection, conditions and surrounding habitat but unlikely to support a roost of high conservation status³.
- High: A tree with one or more PRFs that are obviously suitable for use by larger numbers of bats on a more regular basis and potentially for longer periods of time due to their size, shelter, protection, conditions and surrounding habitat.

In accordance with published good practice, any trees that support PRF's of high or moderate suitability were subject to further inspections, as described below.

² Collin, J (ed)(2016) Bat Surveys for Professional Ecologists: Good Practice Guidelines (3rd edn). The Bat Conservation Trust, London.

³ Generally taken to be maternity or hibernation roosts.

2.3 Bat Presence/Absence Surveys

Dusk presence/absence surveys commence 15 minutes prior to sunset and continued for 1.5 hours after sunset. The re-entry survey commenced 2 hours before sunrise and continued for 15 minutes after sunrise. The standard approach is that trees with (i) high suitability require a minimum of three surveys between May and August; (ii) moderate suitability require a minimum of two surveys between May and September, with at least one of the surveys between May and August and (iii). Trees with low roost suitability do not require an emergence survey to be undertaken but should be felled with precautionary measures in place.

All surveyors were equipped with full spectrum bat detectors (Batlogger M2) to confirm species identification. The timing and weather conditions from each survey are detailed below in Table 2-1. Bat surveys can only be undertaken during good weather conditions (dry, with low levels of wind and warm overnight temperatures).

Table 2-1
Timing and Weather Conditions

Visit	Date	Start/End Time	Sunset/Sunrise time	Weather Conditions	Surveyors
1	27/07/2023	20:50 hrs 22:35 hrs	21:05hrs	Cloud: 1/8 Wind: Force 1 ⁴ Precipitation: 0 Temp: 18°C (start) 17°C (end)	Giselle Hynes Sarah Fletcher
2	10/08/2023	20:26 hrs 22:11 hrs	20:41 hrs	Cloud: 1/8 Wind: Force 3 Precipitation: 0 Temp: 21°C (start) 20°C (end)	Giselle Hynes Sarah Fletcher
3	23/08/2023	04:05 hrs 06:20 hrs	06:05 hrs	Cloud 0/8 Wind: Force 0 Precipitation: 0 Temp: 13°C (start) 13°C (end)	Giselle Hynes Emma Smith

2.4 Limitations

Desk Study

Desk study data is unlikely to be exhaustive, especially in respect of species, and is intended mainly to set a context for the study. It is therefore possible that bat species not identified during the data search do in fact occur within the vicinity of the site. Interpretation of maps and aerial photography has been conducted in good faith, using recent imagery, but it has not been possible to verify the accuracy of any statements relating to land use and habitat context outside of the field study area.

⁴ Wind force measured using the Beaufort scale

Field Survey(s)

As the trees were located adjacent to Ashton Road, it was only possible to view the trees from one side for safety reasons.

An ecological study provides only a “snapshot” of the conditions prevailing at the time of survey. Lack of evidence of any one protected species does not necessarily preclude them from being present on site at a later date. For example, some species, such as bats, are highly mobile and can move between roosts in response to changes in environmental factors; the activity level of an identified roost may therefore fluctuate during the year.

3.0 Results

3.1 Statutory Designated Sites for Nature Conservation

A 2km radius from the Site, has been used to identify those sites that have the potential to be subject to direct or indirect effects from changes associated with the Proposed Development. Within this distance there are two statutory designated site present, Cotswold Water Park SSSI and Coke's Pit Lake LNR. Of these sites, Coke's Pit Lake LNR mentions bats in its citation and is detailed below in Table 3-1.

Table 3-1 Statutory Designated Sites within 2km of the Site.

Site Name	Distance (m) and Direction from site	Site Description
Statutory Sites		
Coke's Pit Lake LNR - National importance	1,250 west	An area of open water with shingle islands, reedswamp, grassland and hedgerows. Wetland plant species include stoneworts, whilst faunal species include water vole <i>Arvicola amphibious</i> , tufted duck <i>Aythya fuligula</i> , common tern <i>Sterna hirundo</i> , reed bunting <i>Emberiza schoeniclus</i> , Daubenton's bat <i>Myotis daubentonii</i> and various dragonflies and damselflies.

3.2 Non-Statutory Designated Sites for Nature Conservation

The Proposed Development is also within a 2km radius of fourteen Local Wildlife Sites (LWS), though none of these sites mention bats in their citations. For a full list of Non-Statutory and Statutory sites provided by the desk study, please refer to the ES Chapter for this Site.

3.3 Pre-existing Data

The MAGIC website indicates that no European Protected Species Licences in respect of bats have been issued within 2km of the site in the last 10 years. The most recent European Protected Species Licence for bats issued was for Daubenton's bat from July 2013 and located 1.7km north-east.

GCER and WSBRC returned records of brown long-eared bat *Plecotus auratus*, common pipistrelle *Pipistrellus pipistrellus*, Daubenton's bat *Myotis daubentonii*, lesser horseshoe bat *Rhinolophus hipposideros*, Nathusius's pipistrelle *Pipistrellus nathusii*, Natterer's bat *Myotis nattereri*, noctule bat *Nyctalus lasiopterus*, serotine *Eptesicus serotinus* and soprano pipistrelle *Pipistrellus pygmaeus* within a 2km radius of the site.

3.4 Preliminary Roost Assessment

The following table provides summary detail of the three trees surveyed as identified on Drawing 1.

Tree no.	Grid Reference	Tree Species	Diameter (m)	Height (m)	Potential Roost Feature Types Present	Preliminary category
1	SU 04139 95944	Ash	1.5	25	Dense ivy, rot hole.	High
2	SU 04139 95894	Ash	1.2	20	Dense ivy.	Low
3	SU 04137 95863	Ash	0.8	15	None	Negligible

As Tree 1 was classed as High Potential for supporting roosting bats, three presence/absence surveys should be undertaken. Tree 2 was classed as Low Potential, trees with low roost suitability do not require an emergence survey to be undertaken, but should be felled with precautionary measures in place. Due to the negligible potential of Tree 3 to support roosting bats, no further survey work or precautionary methods will be required. Bat Presence/Absence Surveys were undertaken of Tree 1 in July and August 2023 to determine the presence or likely absence of bats roosts within the tree. Due to the clutter of the sight lines dawn surveys were deemed better for purposes of roost detection. The results of these surveys are detailed below:

3.4.1 Dusk Survey: 27/07/2023

A common pipistrelle was observed emerging from the northern aspect of tree 1 at 21:37 hrs. This bat then foraged along the hedge line before exiting the site in a westerly direction. Low levels of commuting and foraging activity was also recorded along the hedge by common pipistrelle, noctule, myotis *Myotis sp.* and soprano pipistrelle.

3.4.2 Dusk Survey: 10/08/2023

During the second emergence survey, a common pipistrelle was recorded emerging at 21:08 hrs from the northern aspect of the tree. At 21:16 hrs a soprano pipistrelle was recorded emerging from the southern aspect of the tree. Low levels of commuting activity were also recorded during the survey by common pipistrelle, noctule, *Myotis sp.* and soprano pipistrelle.

3.4.3 Dawn Survey: 23/08/2023

The re-entry survey recorded no bats on the Site. During the survey, weather conditions were suitable for foraging bats although due to the time of year that the survey was undertaken, the roost may have since dispersed.

4.0 Recommendations

4.1 Mitigation

4.1.1 Tree 1

A preliminary bat roost assessment and three presence/absence surveys have been undertaken of Tree 1. Sufficient surveys have been undertaken to confirm the presence of two day roosts on the northern and southern aspect of the tree. The northern roost contained common pipistrelles whilst the southern roost contained soprano pipistrelles. Although the second two surveys were completed outside of the maternity season, it is not thought that the tree contains a maternity roost, due to the low levels of bat activity recorded and the limited size of the features identified. A climbing inspection was not possible due to the ash dieback.

This tree is to be removed due to ash dieback, which poses an immediate health and safety risk to the adjacent road and also to construction workers accessing the site during the future development. As such a full Natural England Bat Mitigation Licence is required. In addition, mitigation features should be provided, estimated as being one maternity suitable box to replace the lost roost and a further box added for each tree lost.

4.1.2 Tree 2

A preliminary bat roost assessment has been undertaken of Tree 2. The tree was semi-mature and in overall good condition, however there was dense ivy located on the main stem and it is unlikely that the tree contains a feature suitable for regular occupation by bats, for either roosting or hibernation. However, features suitable for roosting bats cannot be ruled out and hence the tree is considered to have low potential for roosting bats. Further surveys will not be required, but precautionary methods of working are required should felling or pruning activities be undertaken. A bat licenced ecologist should be present on the day of pruning works, who will inspect any limbs to be pruned/removed for any evidence of roosting bats. This should be completed from a mobile elevating work platform (MEWP).

4.2 Enhancement

Due to the loss of roosting opportunities because of the removal of Tree 1, it is recommended that a bat box is installed on site. This is in addition to any compensation bat boxes installed as part of the Bat Mitigation Licence. It is also advised that tree replacement is implemented. The tree should be replaced on a 2:1 basis. The tree should be replaced with either lime or oak trees⁵. All trees should be protected from incidental deer and squirrel damage until they have become established.

Retention and/or enhancement of any onsite trees and/or hedgerows would also benefit local wildlife and increase biodiversity in an urban environment, as found on site and in the wider landscape.

There were low levels of commuting and foraging from bats recorded during both surveys, and therefore a lighting plan would be recommended to reduce the impacts on this bat activity:

- Lighting: Proposals should impose measures to limit additional light disturbance at site during and after the development. Lighting should follow guidance from the Institute of Lighting Professionals and Bat Conservation Trust⁶

⁵ Planting of ash trees is currently not advised due to the prevalence of ash dieback.

⁶ Institute of Lighting Professionals and Bat Conservation trust (2018), *Bats and Artificial Lighting in the UK*; Bats and the Built Environment Series.

5.0 Summary and Conclusions

SLR was instructed by Acorn Bioenergy (the Client) to undertake a Preliminary Roost Assessment and bat presence/absence surveys to support a planning application for a proposed anaerobic digestion facility at Ashton Keynes.

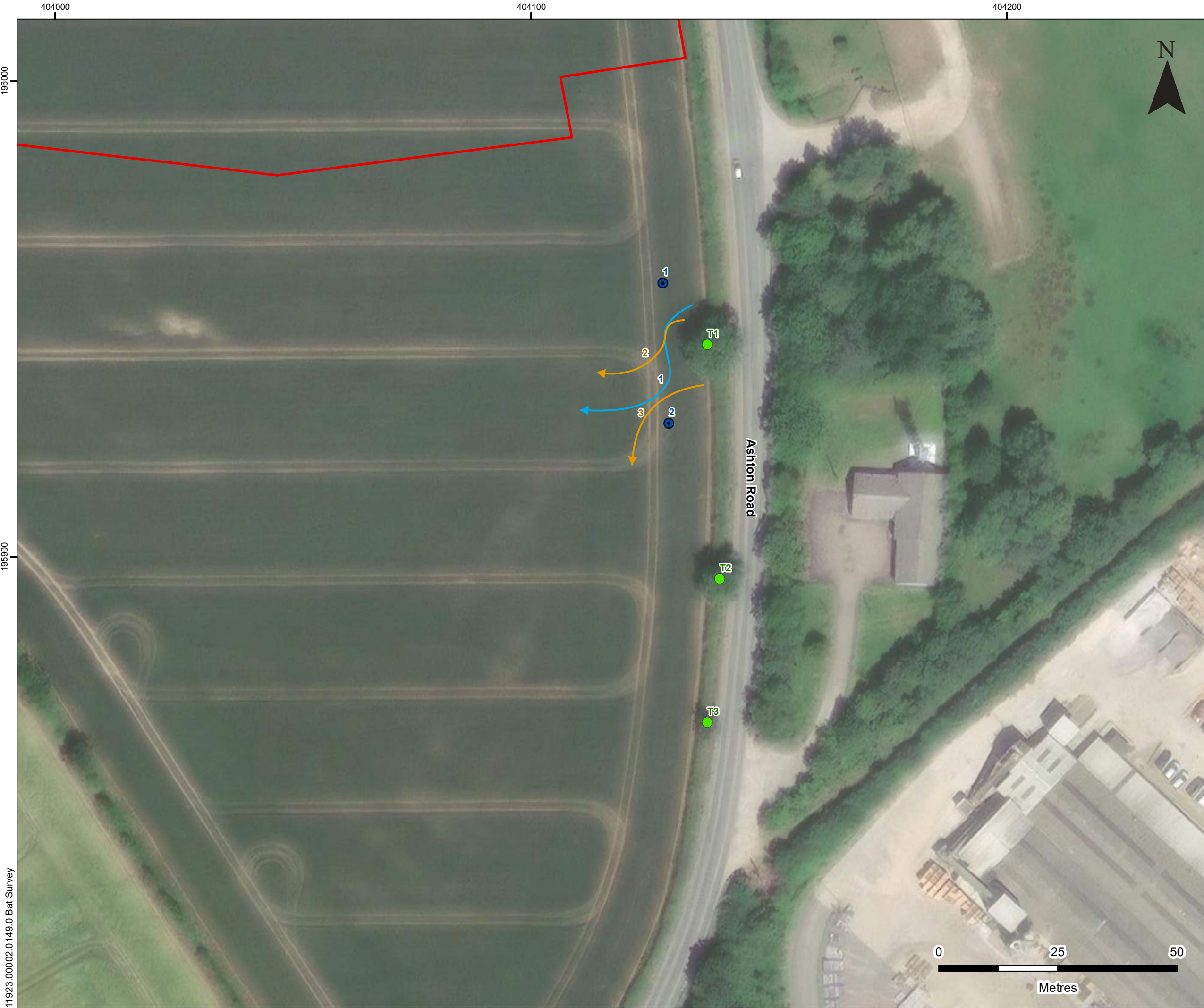
The Preliminary Roost Assessment was undertaken on 27th July 2023 to determine the level of roosting potential within the trees on site. Tree 1 was identified as having high potential, Tree 2 as low potential and Tree 3 as negligible potential. Therefore, two bat emergence surveys and one re-entry survey were undertaken of Tree 1 on 27th July 2023, 10th August 2023 and 23rd August 2023 to identify the presence/likely absence of roosting bats.

During the surveys, three bats, comprising common and soprano pipistrelles, were observed emerging from the tree. The survey results therefore confirm the presence of two day roosts, comprising soprano and common pipistrelle, within Tree 1. As such, the tree should be included in a bat mitigation licence to facilitate felling.

To compensate for the loss of roosting opportunities resulting in the removal of the tree, two general purpose Woodcrete bat boxes should be installed on trees on site. This excludes any compensation bat boxes required for the bat mitigation licence, estimated as being one maternity suitable box to replace the lost roost and a further box added for each tree lost.

DRAWING 1

Bat Survey Map

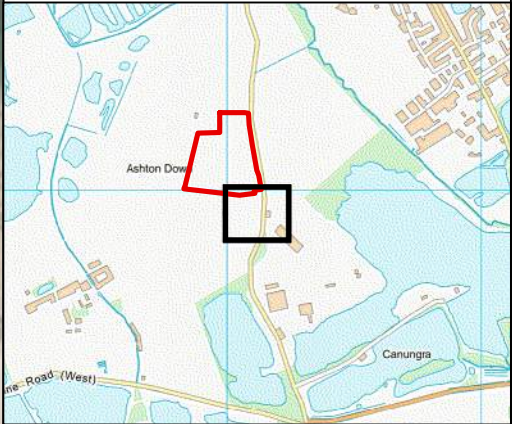


LEGEND

Site Boundary

Surveyor Locations

Bat Flightlines

10/08/202327/07/2023

4/5 LOCHSIDE VIEW
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ASHTON KEYNES

BAT SURVEY REPORT

BAT SURVEY

DRAWING 1

Scale1:750 @ A3

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