The Sizewell C Project

6.5 Volume 4 Southern Park and Ride

Chapter 7 Terrestrial Ecology and Ornithology

Appendix 7A Ecological Baseline and Method Statements

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VOLUME 4, CHAPTER 7, APPENDIX 7A – ECOLOGICAL BASELINE AND METHOD STATEMENTS

Documents included within this Appendix are as follows:

ANNEX 7A.1 - FIGURES (provided separately)

ANNEX 7A.2 - DESK STUDY

ANNEX 7A.3 - SECONDARY DATA

- ANNEX 7A.3 - GREAT CRESTED NEWT SURVEY 2012

ANNEX 7A.4 - PRIMARY DATA

ANNEX 7A.5 - NON-LICENSABLE METHOD STATEMENTS:

- ANNEX 7A.5A - BATS
- ANNEX 7A.5B - REPTILES

NOTE:

Please note that the red line boundary used in figures within this document may have since been amended, and therefore does not reflect the boundaries in respect of which development consent has been sought in this application. However, the amendment to the red line boundary does not have any impact on the findings set out in this document and all other information remains correct.

VOLUME 4, CHAPTER 7, APPENDIX 7A: ECOLOGICAL BASELINE

Contents

Tables

Plates

None provided.

Figures

Appendices

Executive Summary

Baseline ecological conditions were assessed within habitat-, species- or species assemblage specific Zones of Influence (Zol) of the southern park and ride at Wickham Market (from here on referred to as the 'proposed development') and wider study area. The ecological baseline has specifically considered designated sites, plants and habitats, invertebrates, amphibians, reptiles, birds, bats and other terrestrial mammals.

A Zol of 5km was assigned for statutory designated sites, and a Zol of 2km was assigned to non-statutory designated sites, plants and habitats, invertebrates, reptiles, amphibians, birds and terrestrial mammals, which is considered to be conservative. Species-specific Zols were assigned to bat species, ranging from 10km (barbastelle (*Barbastella barbastellus*)) to 2km (common pipistrelle (*Pipistrellus pipistrellus*)), based on species' Core Sustenance Zones (CSZs) as defined by the Bat Conservation Trust (Ref 1.1).

Desk-study data from the Suffolk Biodiversity Information Service was obtained within the relevant Zol, for notable species of conservation interest. A range of species considered to be typical of the habitats present within these areas was identified. Surveys were undertaken between 2011 to 2019 and have been used to help assess the current baseline conditions, these included:

- an Extended Phase 1 Habitat Survey and Protected Species Walkover Survey in 2014;
- targeted amphibian surveys in 2011 and 2014;
- breeding and wintering bird surveys covering the period 2014 to 2015;
- bat activity and static detector surveys in 2014;
- bat tree assessments in 2015; and
- an updated walkover of the site in 2018 to validate that the baseline conditions haven't changed.

Seven non-statutory County Wildlife Sites (CWSs) were identified within a 2km radius of the site boundary. The proposed development (and the wider area) predominately consist of arable farmland, bordered by intact species-poor hedgerows, with one section of native species-rich hedgerow, qualifying as 'important' under the Hedgerow Regulations (Ref 1.2). Broadleaved semi-natural woodland and plantation woodland are also located in the wider area, outside the site boundary, along with an area of standing water.

The site supports a limited assemblage of invertebrates, amphibians, reptiles and terrestrial mammals typical of the habitats present within the site and the ZoI. The site also supported several Schedule 1 wintering bird species (as listed under the Wildlife and Countryside Act (Ref 1.3), and a small number of Birds of Conservation Concern (BoCC) Red List and Amber List species (Ref 1.4) were recorded during the breeding and wintering surveys. Desk studies recorded eight species of bats: surveys identified (with the exception of common and soprano pipistrelle activity) generally low levels of bat activity, although this did include the nationally rare barbastelle. There was no evidence of badger (*Meles meles*) setts within the site, with the arable fields of the site being considered sub-optimal habitat, although a main sett was identified 130m to the east of the site. Except for two to three individuals of brown hare (*Lepus europaeus*), no other terrestrial mammals were recorded.

To ensure a robust Ecological Impact Assessment (EcIA) process, species and habitats of conservation interest and/or legally protected or designated species and habitats within the relevant ZoI of the site have been assessed to determine whether or not they would qualify as Important Ecological Features (IEFs) as defined in the Chartered Institute of Ecology and Environmental Management (CIEEM) guidelines on EcIA (Ref 1.5) In addition, habitats and species have been assessed in accordance with the standard EIA methodology used elsewhere within the Environmental Statement (ES).

The CIEEM guidelines (Ref 1.5) define IEFs on the basis of nature conservation importance as well as legally protected and/or controlled species where there is the potential for a breach in the relevant legislation as a result of the proposed development. This baseline report focuses on those IEFs that have been assessed as being sufficiently important (in nature conservation terms) to be a material consideration in the planning decision. Those IEFs that qualify purely on the basis of legislative considerations are discussed in less detail and are addressed separately in the EcIA.

Based on these criteria, the following species/habitats within the ZoI of the proposed development have been identified as IEFs:

- The bat assemblage is an IEF at the county level under the CIEEM guidelines (Ref 1.5), and of low importance following the EIA-specific assessment methodology.

1 Introduction

1.1 Purpose of this Appendix

1.1.1. SZC Co. is proposing to build a new nuclear power station at Sizewell, known as Sizewell C. The new nuclear power station would be located on the Suffolk coast, north-east of the town of Leiston. The proposed site of Sizewell C lies within an area of high landscape and ecological sensitivity.

1.1.2. As part of the development proposals, a number of sites where associated development are required to support construction and operation of Sizewell C. These associated development sites are not located within the Sizewell C main development site (hereafter referred to as the 'main development site'). Further detail is provided in **Volume 1, Chapter 2**. Each of the associated development sites has been subject to a suite of ecological survey work and desk-study, and the ecological baseline has been developed for each associated development site. This appendix presents the ecological baseline for the southern park and ride at Wickham Market (referred to throughout this volume as the 'proposed development'). The southern park and ride site (herein referred to as the 'site') is located to the west of north-east of Wickham Market.

1.1.3. To carry out a robust Ecological Impact Assessment (EcIA) of the Scheme for the Environmental Impact Assessment (EIA), it is first necessary to determine the ecological baseline describing the existing conditions for the habitats and species that could be affected by the proposed development. Baseline conditions were determined through a combination of a desk-study and field surveys undertaken between 2011 and 2018.

1.1.4. This appendix to the proposed development **Chapter 7** presents the methodologies employed in carrying out the desk studies and detailed surveys (as well as the results of this work), and also evaluates the ecological features that could be affected. This then forms the ecological baseline for the impact assessment presented in **Chapter 7.**

1.2 Structure of this Appendix

1.2.1. This appendix describes the ecological baseline conditions for designated habitats and sites, legally protected species and habitats, and species and habitats of conservation interest within the Zone of Influence (ZoI) of the proposed development and wider study area. ZoI, study area and survey area are all defined in **section 3**.

1.2.2. Within this appendix the following terms are used to describe the biological data underpinning the description of baseline conditions:

- Desk study – this refers to any third-party biological data held, for example, by the Suffolk Biodiversity Information Service or Suffolk Wildlife Trust (SWT), and that has been requested for the site and surrounding area.

- Secondary data – where available, this refers to relevant survey work which has been carried out by other parties (undertaken between 2011 and 2012) Whilst these surveys comprised detailed surveys carried out specifically for the site, and is therefore valuable for helping assess the current baseline conditions, the results relate to areas that now differ from the site boundary presented in the Development Consent Order (DCO) application which has been amended as a result of design development and the consultation process, and/or may require updating; therefore, this information has been treated as targeted and detailed secondary data.

- Primary data – this refers to survey work carried out from 2012 onwards specifically targeted at informing the proposed development. This has built upon the secondary data, and has been scoped with the consultees to ensure a robust and complete data set.

1.2.3. The remainder of this appendix is set out as follows.

- **section 2** discusses the legislative framework of designated sites and legally protected and notable species and habitats;

- **section 3** establishes the site boundary, ZoI(s), study area and survey area for the proposed development;

- **section 4** sets out the approach and methodology used for obtaining the desk-study information, secondary data and primary data used to inform the assessment, as well as the results of this data acquisition. The detail of the desk-study information acquired is presented in **Annex 7A.2**, whilst the various other secondary data reports are presented in **Annex 7A.3.** Detailed results of any surveys carried out since 2012 are presented in **Annex 7A.4**; and

- **section 5** presents the collated baseline conditions for the relevant ecological receptors within the ZoI. This section considers the nature conservation importance and legal protection for each ecological receptor and follows the Chartered Institute of Ecology and Environmental Management (CIEEM) guidelines (Ref 1.5) to assess whether the ecological receptors considered can be categorised as Important Ecological Features (IEFs). Those IEFs which may be materially affected by the proposed development are taken forward for

detailed assessment within the EcIA. The value and sensitivity of the ecological features are also assessed in accordance with the wider EIA methodology used elsewhere within the ES.

1.2.4. Figures summarising the ecological baseline with regard to IEFs are presented in **Annex 7A.1**.

1.3 Legislative Framework

a) Introduction

1.3.1. This section provides a summary of the legislative and policy context regarding designated sites, legally protected and/or controlled species, and other habitats and species of nature conservation importance that could be affected by the proposed development. The aim is to summarise the key implications of this legislation and policy, particularly with regard to how it influences the assessment of IEFs.

b) Designated sites

1.3.2. Three classes of designated site are considered within this report.

- European designations: (Special Protection Areas (SPAs), Special Areas of Conservation (SACs) and Ramsar sites);
- national designations: (Sites of Special Scientific Interest (SSSIs)); and
- non-statutory Local: (County) designations (CWSs).

i. European designated sites

1.3.3. SPAs are classified in accordance with Article 4 of the European Community (EC) 'Birds Directive' (Ref 1.6). They are designated for the protection of rare and vulnerable birds (as listed on Annex I of the Birds Directive), and for regularly occurring migratory species.

1.3.4. SACs are designated under the EC 'Habitats Directive' (Ref 1.7). Article 3 of the EC Habitats Directive (Ref 1.7) requires the establishment of a European network of important high-quality sites that will make a significant contribution to conserving the 189 habitat types and 788 species identified in Annexes I and II of the Directive. The listed habitat types and species are those considered to be most in need of conservation at a European level (excluding birds).

1.3.5. Ramsar sites are wetlands of international importance designated under the Ramsar Convention (Ref 1.8). They often cover a similar area to that already

designated as a SAC and/or SPA, where these sites support a notable amount of wetland habitat.

1.3.6. Before a site can be designated as a European site, it must first have been designated as a SSSI. In many cases, a single European designation may encompass multiple SSSIs. The constituent habitats and species listed within the citations for European sites (often referred to as 'qualifying features') are of European/international importance for nature conservation.

ii. National designated sites

1.3.7. SSSIs are designated at the national level. Originally notified under the National Parks and Access to the Countryside Act (Ref 1.9) SSSIs were re-notified under the Wildlife and Countryside Act (Ref 1.3). Improved provisions for the protection and management of SSSIs were introduced by the Countryside and Rights of Way Act (Ref 1.10). The SSSI network in the UK provides statutory protection for the best examples of the country's flora, fauna, and geological or physiographical features.

1.3.8. These sites are also used to underpin other national and international nature conservation designations (SACs, SPAs, Ramsar sites and National Nature Reserves (NNRs)). NNRs are declared by the national statutory nature conservation agencies under the National Parks and Access to the Countryside Act (Ref 1.9) and the Wildlife and Countryside Act (Ref 1.3).

1.3.9. The constituent habitats and species listed within SSSI and/or NNR citations are of national importance for nature conservation.

iii. Local designated sites

1.3.10. CWSs are non-statutory sites supporting habitats and/or species considered to be rare or vulnerable across the county.

1.3.11. In Suffolk they are identified via a panel that includes technical expertise from Natural England, SWT, Suffolk Biodiversity Information Service and Suffolk County Council. The panel evaluates proposed CWSs against agreed selection criteria to ensure that the sites meet the threshold for designation.

1.3.12. The constituent habitats and species listed within the citations of non-statutory designated sites are of county importance for nature conservation.

c) Legally protected and controlled species

1.3.13. Many species of animals and plants receive some degree of legal protection. For the purposes of this study, legal protection refers to species included on Schedules 1, 5 and 8 of the Wildlife and Countryside Act (Ref 1.3), species

included on Schedules 2 and 5 of The Conservation of Habitats and Species Regulations (Ref 1.11); and badgers (*Meles meles*), which are protected under the Protection of Badgers Act (Ref 1.12).

1.3.14. Species that are fully protected under the Wildlife and Countryside Act (Ref 1.3) and/or Conservation of Habitats and Species Regulations (Ref 1.11), known as protected species and European Protected Species (EPS), respectively, tend to be the focus of impact assessments and nature conservation action in the UK. However, the geographical scale at which they are important varies from species to species. Thus, the designation of a species as an EPS does not necessarily mean that all individuals of that species are of European importance.

1.3.15. In addition, Schedule 9 of the Wildlife and Countryside Act (Ref 1.3) lists controlled species of animal that it is an offence to release or allow to escape into the wild, as well as species of plant that it is an offence to plant or otherwise cause to grow in the wild. These species are clearly not of any nature conservation importance (other than with regard to the damage they can do to habitats and species of importance) and are therefore not a material consideration in planning decisions. They do, however, require careful consideration in the design and implementation of development.

d) Priority habitats and species

1.3.16. Public bodies have a duty to conserve biodiversity, in accordance with Section 40 of the Natural Environment and Rural Communities (NERC) Act (Ref 1.13). In addition to designated sites and legally protected/controlled species (discussed in **section 2.2** and **2.3**), a large number of habitats and species have been identified as a priority for biodiversity conservation within the UK. These features therefore also need due consideration in any EcIA, although the level at which they are considered important will vary.

1.3.17. Priority habitats and species groupings considered within this report include:

- habitats and species of principal importance for the conservation of biological diversity in England, as listed under Section 41 of NERC Act (Ref 1.13);
- species listed as being of conservation interest in the relevant UK Red Data Book (RDB) or the Bird of Conservation Concern (BoCC) Red List (Ref 1.4);
- Nationally Scarce species, which are species recorded from 16-100 10x10km grid squares in the UK;

- ancient woodland (i.e. areas that have been under continuous woodland cover since at least 1600, and which are listed within the relevant county Ancient Woodland Inventory); and

- habitats and species listed on Suffolk's Priority Species and Habitats list (Ref 1.14).

1.3.18. It should be noted that a large number of habitats and species will qualify under more than one of the above instruments, and will also need to be considered at the correct spatial scale, so the process of assigning importance to these features is therefore a complex one. For example, within Section 41 of the NERC Act (Ref 1.13), habitats and species of principal importance for the conservation of biological diversity in England would be considered to be of national importance, reflecting the fact that these features have been assessed at a national level. However, this status relates to the total amount/population and distribution of habitat/species. The level of importance therefore pertains to the species/habitat concerned as a whole rather than to individual areas of habitat or species populations, which can be difficult to value objectively.

1.3.19. Within this ecological baseline report, detailed consideration is given to the importance assigned to each ecological feature (both habitats and species, and species assemblages), and this necessarily requires a degree of professional judgement.

1.4 Scope of the baseline

a) Introduction

1.4.1. This section defines the terms 'site boundary', 'ZoI', and 'study area' and 'survey area', and the terminology and approach applied to the ecological data.

b) Site boundary

1.4.2. Survey work conducted pre-2012 was conducted for an area that differs from the site boundary proposed in the DCO application and upon which post-2012 ecological baseline surveys have been based. Further surveys undertaken to update any secondary data (where ecologically appropriate) and to take into account any changes to areas surveyed in relation to the site boundary. Please refer to **Figure 7.1** in **Annex 7A.1** for the site boundary of the proposed development.

c) Defining the Zones of Influence

1.4.3. The ZoI is defined as '*the area over which ecological features may be affected by biophysical changes caused by a proposed project and associated activities*' (Ref 1.5).

1.4.4. It is not a simple task to define the extent of the ZoI for the proposed development, as it follows that the ZoI will be different for each ecological feature and with the biophysical change being considered. For example, disturbance to bird species caused by displaced activities is likely to manifest itself over a larger area than disturbance caused to bird species arising from construction noise, which is likely to be limited to the area in close proximity to the construction activity.

1.4.5. An appropriate ZoI has been defined for each ecological feature (species, assemblage or habitat) considered, using published information and professional judgement. Given the discrete nature of the associated development site proposals and the likelihood that effects arising from the proposed development will be highly localised, 5km is considered to be a suitable maximum radius over which to considered potential effects, unless otherwise defined for specific species or species groups. Statutory designated sites (SPAs, SACs, Ramsar sites and SSSIs) have been considered within a 5km radius, and CWS within a 2km radius.

1.4.6. For interest features of designated sites (i.e. species), only those designated sites falling within the ZoI of that species or species assemblage are considered. For example, all statutory designated sites within 5km are considered, but only those falling within the 2km ZoI for reptile species are assessed for their specific value to reptile species (i.e. presence of reptile species as a cited interest feature).

1.4.7. Full details of the ZoI defined for the considered ecological features is provided in **section 3.5**.

d) Defining the study area and survey area

1.4.8. The study area is the land within the site boundary and ZoI (as defined within **section c)**) of the proposed development. This includes desk-study data, primary data and secondary data. The study area will differ depending on the type of data and the data sets being considered. For example, desk-study data relating to barbastelle (*Barbastella barbastellus*) extends over 10km, whilst desk-study information pertaining to breeding bird species covers a much smaller geographical extent, limited to a 2km radius of the site boundary.

1.4.9. The survey area is defined as *'the geographical extent over which a particular field survey activity took place'*. Similarly, it follows that the survey area will differ depending on the type of survey being considered. For example, great crested newt surveys were undertaken within the site boundary and a 500m radius, whilst no surveys were undertaken for invertebrates, reptiles or terrestrial mammals as the Phase 1 Habitat/Protected Species survey identified habitats within the site boundary and the wider area to be sub-optimal for these species. However, as part of the Extended Phase 1 Habitat/Protected Species surveys, protected species, such as badger, within the site boundary were considered.

1.4.10. Professional judgement has been used to ensure that sufficient ecological information has been obtained within the likely ZoI that has been defined for each habitat and species assemblage. The study area for each habitat and species assemblage generally closely corresponds to the ZoI, whilst the survey areas are more limited in extent, being targeted at key areas where it is envisaged effects on ecological receptors may manifest themselves. Surveys undertaken at different time periods (see definitions of secondary and primary data in **section 1.2**) may encompass a different geographical area as site boundaries and development plans have developed and altered over time. For some ecological features, it was not considered necessary to undertake specific field survey work. In these instances, the ecological baseline has been informed by desk-study or other secondary data obtained within the defined study area.

e) Defining ZoI, study area and survey area for ecological features

1.4.11. **Table 1.1** below defines the ZoI, study area and survey area for the considered ecological features.

Table 1.1: Specific ZoI, study area and survey areas for ecological features

Ecological Feature		ZoI	Study Area	Survey Area
Designated Sites	Statutory designated	5km	5km	
	Non-statutory designated	2km	2km	N/A
Plants and Habitats		2km	2km	Within the site boundary*
Invertebrates		2km	2km	Not surveyed as habitat suboptimal
Reptile		2km	2km	Not surveyed as habitat largely suboptimal

Ecological Feature		Zol	Study Area	Survey Area
Amphibians		2km	2km	Within the site boundary* and a 500m buffer area**
Birds		2km	2km	Within the site boundary
Bats	Natterer's bat (*Myotis nattereri*)	4km	4km	Within the site boundary
	Noctule (*Nyctalus noctula*)	4km	4km	
	Leisler's bat (*Nyctalus leisleri*)	3km	3km	
	Common pipistrelle (*Pipistrellus pipistrellus*)	2km	2km	
	Soprano pipistrelle (*Pipistrellus pygmaeus*)	3km	3km	
	Nathusius' pipistrelle (*Pipistrellus nathusii*)	3km	3km	
	Serotine (*Eptesicus serotinus*)	4km	4km	
	Barbastelle (*Barbastella barbastellus*)	10km	10km	
	Brown long-eared bat (*Plecotus auritus*)	3km	3km	
Terrestrial Mammals		2km	2km	Included as part of Extended Phase 1 Habitat and Protected Species survey

* This is in accordance with standing advice from Natural England for assessing the impacts of developments on great crested newts (*Triturus cristatus*) (Ref 1.15).

1.4.12. Consideration of the Zol, study area and survey area for bats has been undertaken on a species-specific basis to take into account species-specific variations in foraging and commuting distances. The Zol for bat species has therefore been determined on the basis of Core Sustenance Zones (CSZs), which have been defined by the Bat Conservation Trust (Ref 1.1), through an extensive literature review. With reference to planning and development, the CSZ is defined as:

- The area surrounding the roost within which development work can be assumed to impact the commuting and foraging habitat of bats using

the roost, in the absence of information on local foraging behaviour. This will highlight the need for species-specific techniques where necessary.

- The area within which mitigation measures should ensure no net reduction in the quality and availability of foraging habitat for the colony, in addition to mitigation measures shown to be necessary following ecological survey work.

1.4.13. CSZs may be used to indicate commuting and foraging areas used by bats in relation to a roost, and to interpret the results of data searches. The only variation that has been made from the use of CSZs is in the case of barbastelle. The CSZ determined for barbastelle is 6km; however, this has been increased to 10km on the basis of the results of radio-tracking surveys across the main development site which showed barbastelle to be using larger areas in that location (**Volume 2, Appendix 14A8 - Bats**). The results from the main development site data has been used to infer localised bat behaviour.

1.5 Desk-study/Baseline data

a) Approach and methodology

i. Desk-study

1.5.1. Records for protected species were requested from Suffolk Biodiversity Information Service in December 2014. Records of protected or otherwise notable species of conservation interest within 2km of the site boundary were obtained. A further desk-study data request was made to Suffolk Biodiversity Information Service in March 2016 for bat records within 10km of the site boundary to take into account the CSZ (see **section 3**).

1.5.2. Statutory and non-statutory designated sites were considered within the following radii of the site:

- internationally (SPA, SAC and Ramsar) and nationally (SSSI and NNR) recognised sites within 5km; and

- locally recognised sites (Local Nature Reserves and CWS) within 2km.

1.5.3. Where designated sites were found to fall within the radii detailed above, citations were obtained from Suffolk Biodiversity Information Service /the Joint Nature Conservation Committee and Natural England's websites. The citations were reviewed to allow for an assessment of the likely presence of

any species or habitats of nature conservation importance which may pose a constraint to the proposed development.

1.5.4. The Suffolk Biodiversity Action Plan (BAP) (Ref 1.16), Suffolk's Priority Species and Habitats list (Ref 1.14), and the habitats and species of principal importance included on the Section 41 list of the NERC Act (Ref 1.13), were also reviewed with reference to the habitats and species present, or likely to be present, within the site and wider study area.

ii. Secondary data

1.5.5. Early surveys were conducted from 2011 up until 2012 for the associated development sites; however, the site boundary for the proposed development has changed since these were completed. These data were reviewed to understand the baseline conditions relevant to the site boundary.

1.5.6. Of these surveys, only the 2011 amphibian surveys were considered relevant to the site boundary proposed in the DCO application (Ref 1.17). These are the only secondary data used to inform this baseline. Relevant reports detailing the methodology and results are provided in **Annex 7A.3**.

iii. Primary data

1.5.7. Further surveys have been undertaken since 2012, both to update any secondary data (where ecologically appropriate) and to take into account any changes to areas surveyed in relation to the site boundary. Further surveys conducted included:

- an Extended Phase 1 habitat survey/protected species survey (2014). This included an investigation for badgers, and involved and assessment for the potential use of the site by dormice;
- great crested newt surveys (2014);
- breeding bird surveys (April to June 2014) and wintering bird surveys (November 2014 to March 2015);
- bat surveys (2014 and 2015) (tree assessment, and activity and static surveys); and
- an updated walkover to confirm site conditions (2018).

1.5.8. Full details of the methodologies employed can be found in **Annex 7A.4**.

1.5.9. A review of aerial photographs and a 2018 site visit to check site conditions, showed that there were no significant material changes to the habitats present within the site since the 2014 Extended Phase 1 habitat survey. Therefore, the Extended Phase 1 habitat survey was not repeated and no targeted invertebrate, reptile or other mammal surveys were carried out.

b) Results

i. Designated and non-designated sites

1.5.10. There are no statutory designated sites of nature conservation importance within 5km of the site boundary.

1.5.11. Seven non-statutory designated CWSs were identified within 2km of the site boundary. Details of these sites are provided in **Table 1.2** below and the location of these sites illustrated on **Figure 7.1** in **Annex 7A.1**.

Table 1.2: Non-statutory designated site within 2km of the site

Site name	Distance from site	Reason for designation
Catt's Wood Also an Ancient and Semi-Natural Woodland (ASNW) and on the Ancient Woodland Inventory (AWI)	750m west	The site is designated as ancient coppice woodland and mainly comprises Ash (*Fraxinus excelsior*), Field Maple (*Acer campestre*), Hazel (*Corylus avellana*) and Horse-chestnut (*Aesculus hippocastanum*) coppice with a varied ground flora containing ancient woodland indicator plants such as Remote Sedge (*Carex remota*) and Primrose (*Primula vulgaris*).
Great Wood, Glevering Hall Also an ASNW and on the AWI	1.4km west	A large ancient woodland with mixed broadleaved trees and a large herb-rich glade, located approximately 1km from the Site. The woodland comprises mainly Hazel, Field Maple and Hornbeam (*Carpinus betulus*) coppice with sparse Ash. A diverse and abundant ground flora is found within the area, with 103 species recorded including Moschatel (*Adoxa moschatellina*), Common Spotted-orchid (*Dactylorhiza fuchsia*) and Hairy St John's-wort (*Hypericum hirsutum*).
Lower Hacheston Meadow	430m west on the other side of the A12	This CWS contains a diverse wetland habitat with locally rare species such as Ragged-Robin (*Lychnis flos-cuculi*) and Marsh-marigold (*Caltha palustris*).
The Oaks Also an ASNW and on the AWI	1.2km south on the other side of the A12	An area of ancient woodland with a wide range of ground flora including ancient woodland indicators such as Orpine (*Sedum telephium*), Bluebell (*Hyacinthoides non-scripta*) and Remote Sedge.
Copperas Wood	1.8km south west on the other side of the A12	Copperas Wood is divided into two parts, to the south-west and to the north-east, separated by an area of unimproved meadow. The south-west portion was a pine (*Pinus* sp.)/Sweet Chestnut

Site name	Distance from site	Reason for designation
		(*Castanea sativa*) plantation which has recently been felled. Old Hazel and Field Maple coppice with Oak (*Quercus* sp.) and Ash standards survives, and ground flora here includes Bluebell and Primrose. The north-east part of the wood is Hazel and Ash coppice with Oak standards. The ground flora in this part of the wood includes Primrose and Remote Sedge.
Ashe Abby Decoy Pond	1.7km south on the other side of the A12	Woodland surrounding a large, man-made lake fed by the River Deben. The lake supports a good population of both Yellow Water-lily (*Nuphar lutea*) and White Water-lily (*Nymphaea alba*).
River Deben	1.6km west	Water quality is particularly good and the area supports a wide range of aquatic and emergent species such as the regionally scarce River Water-dropwort (*Oenanthe fluviatilis*).

1.5.12. The majority of these sites comprise lowland mixed deciduous woodland with Lower Hatcheston meadows supporting wetland habitat and the River Deben supporting a riverine habitat. Lowland mixed deciduous woodland, rivers and wetland habitat are listed under Section 41 of the NERC Act (Ref 1.13) and habitats are also targeted for action under the Suffolk's Priority Species and Habitats list (Ref 1.14).

1.5.13. The development proposals will involve no direct land take from any of these non-statutory designated sites.

ii. Plants and habitats

1.5.14. The desk-study identified a number of records for plant species within 2km of the site boundary. These records have been sorted by location to identify those recorded within or close to the site. The results are presented in **Annex 7A.2** whilst a summary is presented below.

1.5.15. The plant species identified by the desk-study data can be divided into two broad categories: species such as Frogbit (*Hydrocharis morsus-ranae*) and Black Polar (*Populus nigra subsp. betulifolia*) associated with wetland habitat to the west of the site along the valley of the River Alde, and species characteristic of the margins of arable fields, including Common Cudweed (*Filago vulgaris*) and Nottingham Catchfly (*Silene nutans).*

1.5.16. A single species listed under Section 41 of the NERC Act (Ref 1.13) was identified, Marsh Stitchwort (*Stellaria palustris*), which is a species of wetland habitat such as bogs and fens and is therefore unlikely to be present within

the arable fields which comprise the site. Two Nationally Scarce[1] species were identified: Nottingham Catchfly (*Silene nutans*)[2] and Blue Pimpernel (*Anagallis arvensis* subsp*. foemina)*. Both these species are characteristic of the margins of arable fields. None of these species were recorded as being present within the site boundary during surveys.

1.5.17. Suffolk Biodiversity Information Service also provided records of non-native invasive plant species listed under Schedule 9 of the Wildlife and Countryside Act (Ref 1.3). Six species have been identified, these being: Nuttall's Waterweed (*Elodea nuttallii)*; False Virginia-creeper (*Parthenocissus inserta*); Japanese Knotweed (*Fallopia japonica*); Indian (also known as Himalayan) Balsam (*Impatiens glandulifera*); Rhododendron (*Rhododendron ponticum*) and Giant Hogweed (*Heracleum mantegazzianum*). None of these species were recorded as being present within the site boundary during surveys.

1.5.18. The site comprises large arable fields separated by a track. The crops are intensively managed and 'clean' and had, at the time of survey, been treated with herbicide, such that no scarce arable weeds or other notable plant species were identified. In the majority of instances, the crops had been planted up to the edges of the fields and no weedy margins were noted.

1.5.19. The fields are bounded by fences and hedgerows. Eleven hedgerows (labelled H on **Figure 7.2** in **Annex 7A.1**) have been identified. Two hedgerows (H1 and H5) are considered to be species-rich (with five or more woody species), and H5 is also considered to be 'Important' when assessed against the Wildlife and Landscape Criteria of the Hedgerows Regulations (Ref 1.2). The remaining nine hedgerows are species-poor and dominated by Hawthorn (*Crataegus monogyna*) and Blackthorn (*Prunus spinosa*). Hedgerows are included on Suffolk's Priority Species and Habitats list (Ref 1.14) and are listed as a habitat of principal importance under Section 41 of the NERC Act (Ref 1.13).

1.5.20. A number of blocks of woodland are present outside of the site boundary. These include three blocks of broad-leaved plantation woodland which include Field Maple; Sweet Chestnut and English Elm with ground flora including Common Nettle (*Urtica dioica*), Cow Parsley (*Anthriscus sylvestris*) and Lords-and-Ladies (*Arum maculatum*). These plantations are described further in Target Notes 1, 5 and 7 (see **Annex 7A.4**). There are also two blocks of broad-leaved semi-natural woodland called Wonder Grove and Whin Belt. Tree species present include Ash, Oak and Sycamore, with an understory of Hawthorn (*Crataegus monogyna*) and Elder. The ground flora comprises Dog's Mercury (*Mercurialis perennis*), Cleavers (*Galium aparine*),

[1] NS – Nationally Scare (Occurring in 16-100 hectars in Great Britain).
[2] Also listed as 'Near Threatened' within 'A Vascular Plant Red List for England' (Stroh, *et al.*, 2014).

False Brome (*Brachypodium sylvaticum*), and Garlic Mustard (*Alliaria petiolata*) (both areas are described further in Target Notes 9 and 10 (see **Annex 7A.4**)). Lowland mixed deciduous woodland is included on Suffolk's Priority Species and Habitats list (Ref 1.14) and is listed as a habitat of principal importance under Section 41 of the NERC Act (Ref 1.13). Several scattered trees are present around the field boundaries, particularly adjacent to the track.

1.5.21. An improved grassland field is present outside the site boundary to the north-east (Target Note 2). This field is used as a bike/go kart track and there are raised banks with tall ruderal herbs adjacent to the track. Another area of tall ruderal herbs is present within the northern part of this field dominated by Common Nettle (*Urtica dioica*) and Hemlock (*Conium maculatum)*.

1.5.22. A single pond, dry at the time of survey, is within the site boundary (Target Note 7). A further two ponds are outside of the site boundary, to the west of the eastern-most field (Target Note 6). Ponds are a habitat listed on Suffolk's Priority Species and Habitats list (Ref 1.14).

1.5.23. The 2018 site visit confirmed no significant material changes to the habitats recorded during the extended Phase 1 habitat survey. None of the habitats identified are of significant ecological value. The Phase 1 Habitat survey map and associated Target Notes are presented in **Figure 7.2** in **Annex 7A.1** and the Target Notes are described in **Annex 7A.4**.

iii. Invertebrates

1.5.24. No records from Suffolk Biodiversity Information Service of protected or notable invertebrates within the site boundary were revealed by the desk-study.

1.5.25. There were records of five species of butterfly within 2km of the site boundary, notably: small heath (*Coenonympha pamphilus*); grayling (*Hipparchia semele*); wall (*Lasiommata megera*); white admiral (*Limentis camilla*) and swallowtail (*Papilio machaon*). Of these species, swallowtail is afforded protection under Schedule 5 of the Wildlife and Countryside Act (Ref 1.3). The remaining species are all listed as species of principal importance under Section 41 of the NERC Act (Ref 1.13), and are included on Suffolk's Priority Species and Habitats list (Ref 1.14).

1.5.26. Swallowtail butterfly requires the food plant Milk-parsley (*Peucedanum palustre*) which only grows in wet reedbed and fen meadows. This habitat type and plant species is not present within the site boundary; therefore, this species will not be present, except as an occasional vagrant. The larval food plants of the remaining butterfly species are largely absent from within the

site boundary, and the habitats present are unlikely to be of significant ecological value to invertebrates due to their low species diversity.

1.5.27. Suffolk Biodiversity Information Service provided records of two aquatic beetle species within 2km of the site boundary. *Nebrioporus* (*Nebrioporus*) *elegans* is a Nationally Notable B[3] species. This species is also included on the International Union for Conservation of Nature (IUCN) Red List for Great Britain, categorised as Lower Risk (near threatened). *Gyrinus aerates* is a Nationally Scarce[4] species. The ponds adjacent to the site (Ponds 60 and 61) are outside the site boundary and will not be affected by the proposed development; therefore, even if these two species occurred in these ponds, they would not be directly affected by the development proposals.

1.5.28. Overall, the habitats within the site boundary consist primarily of intensively managed arable fields and no habitats of particular value to invertebrate species have been identified.

iv. Amphibians

1.5.29. The 2014 desk-study revealed 13 records of amphibians within 2km of the proposed site boundary, with records dated from 1999 to 2011. Species recorded comprised common toad (*Bufo bufo*) and great crested newt. No great crested newts were recorded within 500m of the site boundary. The nearest pond containing records of great crested newts was 1.6km to the north. The full results of the 2014 desk-study are presented in **Annex 7A.2**.

1.5.30. Suffolk is a stronghold for the great crested newt, particularly in the north-east of the county, where there is a higher abundance of ponds (Ref 1.18). A review of Suffolk's Priority Species and Habitats list (Ref 1.14) identified great crested newts as priority species for conservation action in the county. Great crested newts are also listed under Section 41 of the NERC Act (Ref 1.13), and protected under Schedule 5 of the Wildlife and Countryside Act (Ref 1.3), and Schedule 2 of the Conservation of Habitats and Species Regulations (Ref 1.11).

1.5.31. Three ponds (Ponds 59, 60 and 61 on **Figure 7.3** in **Annex 7A.1**) were identified in the pre-2012 surveys within the study area, as potentially suitable for breeding amphibians. Land access was not obtained to survey these

[3] Taxa that do not fall within RDB categories but are nonetheless uncommon in Great Britain and thought to occur in between 31 and 100 10km squares of the National Grid or, for less-well recorded groups between eight and twenty vice-counties

[4] Taxa that do not fall within RDB categories but are nonetheless uncommon in Great Britain, and thought to occur in between 16 and 100 10km squares of the National Grid

ponds to either obtain a Habitat Suitability Index (HSI[5]) score or to carry out targeted amphibian surveys (Ref 1.17).

1.5.32. In post-2012 studies, nine water bodies (ponds) from the desk-study within 500m of the site. Access was not granted to four of these ponds (Ponds 62, 63, 65 and 67). One pond (Pond 66) was scoped out as it was east of the A12 trunk road and the busy B1078 slip roads onto the A12. These roads act as a barrier to the dispersal of great crested newts; in addition, the habitat between Pond 66 and the site boundary is unsuitable for newts comprising an intensive arable field, with more optimal newt habitat including scrub found to the south of Pond 66. Therefore, any newts using Pond 66 would be unlikely to access the site boundary. Of the remaining four ponds, two (Pond 59 and 64), one of which (Pond 59) is within the site boundary, were found to be dry in early Spring, and evidence suggested that both ponds had not held water for a significant period of time. Pond 59 and 64 were therefore scoped out of future survey work.

1.5.33. The remaining two ponds (Pond 60 and 61) located outside of the site boundary to the west of the eastern-most field, were surveyed. Both ponds merited a 'Below Average' HSI score. Factors limiting the suitability of these ponds were poor water quality, excessive shading and heavy algal cover. No great crested newts were found in either pond during targeted surveys.

1.5.34. The majority of the site is of limited suitability for great crested newts as it consists of intensively managed arable fields. However, the field margins, an area of tall ruderal herbs at the west corner of Whin Belt, the margins of the small patch of woodland to the north of Whin Belt, and the disused pit area to the south of Whin Belt provide habitat that is suitable for great crested newts in their terrestrial phase. The woodland also provides suitable hibernation sites.

1.5.35. Full amphibian survey results are presented in **Annex 7A.4**.

v. Reptiles

1.5.36. The review of the Suffolk's Priority Species and Habitats list (Ref 1.14) identified four reptile species (adder (*Vipera berus*), common lizard (*Zootoca vivipara*), grass snake (*Natrix helvetica helvetica*) and slow-worm (*Anguis fragilis*)) as priority species for conservation action in the county. In addition, all four species are included within Section 41 of the NERC Act (Ref 1.13).

1.5.37. The desk-study revealed ten records of reptiles within 2km of the site boundary. Species recorded comprised slow-worm, grass snake, common

[5] The HSI assesses the suitability of a waterbody to support breeding great crested newts. The higher the score the more suitable the waterbody.

lizard and adder. Records of adder are located closest to the Red line boundary approximately 600m to the north. The remaining records are all located in excess of 1km from the site.

1.5.38. While no reptile surveys were conducted, the majority of this site comprises intensively managed arable fields which are unsuitable for reptiles. However, an area of tall ruderal herbs at the west corner of Whin Belt, the track to and margins of the small patch of woodland to the north of Whin Belt, and the disused pit area to the south of Whin Belt provide habitat that is suitable foraging habitat for small numbers of reptiles. The woodland areas also have the potential to provide hibernation sites. The available habitat to support reptile species is considered to be extremely limited and the site considered to be of little value to reptile species.

vi. Birds

1.5.39. The results of the desk-study presented in **Annex 7A.2** has identified records of 11 bird species that are protected under Schedule 1 of the Wildlife and Countryside Act (Ref 1.3), 17 species on the Red List of BoCC (Ref 1.4) (species of high conservation value) and 11 species found on the Amber List of BoCC (species of medium conservation value). In addition, a further 18 species that are either Green List or of no conservation concern (species of low conservation value) were also identified. A number of species are also listed within Section 41 of the NERC Act (Ref 1.13). The species identified are presented in **Table 1.3**.

Table 1.3: Desk-study records for notable bird species and their status within 2km

Bird Species	Sch 1 Wildlife and Countryside Act *	Section 41 NERC Act	Red List (BoCC)	Amber List (BoCC)
Kingfisher (*Alcedo atthis*)	✓			
Green sandpiper (*Tringa ochropus*)	✓			
Hen harrier (*Circus cyaneus*)	✓	✓		
Osprey (*Pandion haliaetus*)	✓			
Honey buzzard (*Pernis apivorus*)	✓			
Hobby (*Falco Subbuteo*)	✓			
Brambling (*Fringilla montifringilla*)	✓			
Black redstart (*Phoenicurus ochruros*)	✓			
Redwing (*Turdus iliacus*)	✓			
Fieldfare (*Turdus pilaris*)	✓			
Barn owl (*Tyto alba*)	✓			

Bird Species	Sch 1 Wildlife and Countryside Act *	Section 41 NERC Act	Red List (BoCC)	Amber List (BoCC)
Lapwing (*Vanellus vanellus*)		✓	✓	
Herring gull (*Larus argentatus*)		✓	✓	
Turtle dove (*Streptopelia tutur*)		✓	✓	
Cuckoo (*Cuculus canorus*)		✓	✓	
Grey partridge (*Perdix perdix*)		✓	✓	
Skylark (*Alauda arvensis*)		✓	✓	
Yellowhammer (*Emberiza citronella*)		✓	✓	
Linnet (*Carduelis cannabina*)		✓	✓	
Grey wagtail (*Motacilla cinerea*)			✓	
Spotted flycatcher (*Muscicapa striata)*		✓	✓	
Marsh tit (*Poecile palustris*)		✓	✓	
House sparrow (*Passer domesticus*)		✓	✓	
Nightingale (*Luscinia megarhynchos*)			✓	
Starling (*Sturnus vulgaris*)		✓	✓	
Grasshopper warbler (*Locustella naevia*)		✓	✓	
Song thrush (*Turdus Philomena*)		✓	✓	
Lesser spotted woodpecker (*Dendrocopus minor*)		✓	✓	
Greylag goose (*Anser anser*)				✓
Shelduck (*Tadorna tadorna*)				✓
Swift (*Apus apus*)				✓
Kestrel (*Falco tinunculus*)				✓
Reed bunting (*Emberiza schoeniclus*)		✓		✓
Common redpoll (*Carduelis flammea*)				✓
Bullfinch (*Pyrrhula pyrrhula*)		✓		✓
House martin (*Delichon urbica*)				✓
Meadow pipit (*Anthus pratensis*)				✓
Dunnock (*Prunella modularis*)		✓		✓
Tawny owl (*Strix aluco*)				✓

*Sch 1 Wildlife and Countryside Act: Schedule 1 of the Wildlife and Countryside Act (Ref 1.3).

1.5.40. Of the of eleven bird species that are protected under Schedule 1 of the Wildlife and Countryside Act (Ref 1.3) the majority are considered to be

passage migrants and unlikely to be breeding within the site. Only hobby and barn owl are considered likely to breed in the vicinity of the site boundary with fieldfare and redwing being recorded as Winter visitors. Of the BoCC Red List bird species recorded, linnet, skylark, yellowhammer and grey partridge are the species considered most likely to be breeding within the arable habitat present.

Breeding Bird Survey Results

1.5.41. No Schedule 1 species of the Wildlife and Countryside Act (Ref 1.3) were recorded over the course of the breeding bird survey. Six species listed under Section 41 of the NERC Act (Ref 1.13) were recorded. Of these, five are Red List species of BoCC (Ref 1.4) and one is Amber List species of BoCC (Ref 1.4). An additional four species on the Amber List on BoCC (Ref 1.4) were also recorded. The location of these are shown in **Figure 7.4** in **Annex 7A.1**. A summary of these results can be found in **Table 1.4**.

Table 1.4: Species of conservation concern recorded during the breeding bird surveys

Bird Species	Sch 1 Wildlife and Countryside Act*	Section 41 NERC Act	Red List (BoCC)	Amber List (BoCC)	Peak Count
Lapwing		✓	✓		1
Linnet		✓	✓		2
Skylark		✓	✓		11
Song thrush		✓	✓		1
Yellowhammer		✓	✓		4
Dunnock		✓		✓	6
Lesser black-backed gull *(Larus fuscus)*				✓	9
Meadow pipit				✓	2
Stock dove *(Columba oenas)*				✓	2
Whitethroat *(Sylvia communis)*				✓	5

1.5.42. In addition to the above, a number of Green Listed species of BoCC (Ref 1.4) (species of no conservation concern) were recorded. These species are listed in **Table 4.3** in **Annex 7A.4**.

1.5.43. The breeding assemblage of birds is considered typical of the woodland and intensively managed arable habitats present

Winter Bird Survey Results

1.5.44. During the wintering bird surveys, two species listed under the Schedule 1 Wildlife and Countryside Act (Ref 1.3) were recorded. The locations of these have been shown in **Figure 7.5** in **Annex 7A.1**. Nine species listed under Section 41 of the NERC Act (Ref 1.13) were recorded. Of these, seven were Red List species of BoCC (Ref 1.4) and two were Amber List species of BoCC (Ref 1.4). The location of these records are shown in **Figure 7.6** in **Annex 7A.1**. In addition to this, seven Amber List species of BoCC (Ref 1.4) were also recorded. A summary of these results can be found in **Table 1.5**.

Table 1.5: Species of conservation concern recorded during the wintering bird surveys

Bird Species	Sch 1 Wildlife and Countryside Act*	Section 41 NERC Act	Red List (BoCC)	Amber List (BoCC)	Peak Count
Fieldfare	✓				1
Redwing	✓				31
Grey partridge		✓	✓		3
Herring gull		✓	✓		30**
Linnet		✓	✓		1
Mistle thrush (*Turdus viscivorus*)		✓	✓		1
Skylark		✓	✓		56
Song thrush		✓	✓		18
Yellowhammer		✓	✓		11
Bullfnch (*Pyrrhula pyrrhula*)		✓		✓	2
Dunnock		✓		✓	9
Black-headed gull *(Chroicocephalus ridibundus)*				✓	43
Greylag goose				✓	1
Kestrel				✓	1
Mallard *(Anas platyrhynchos)*				✓	65
Meadow pipit				✓	8
Snipe *(Gallinago gallinago)*				✓	42
Stock dove				✓	27

*Sch 1 Wildlife and Countryside Act: Schedule 1 of the Wildlife and Countryside Act (Ref 1.3)

**The majority of these birds were observed commuting over the site

1.5.45. In addition to the above, a number of Green Listed species of BoCC (Ref 1.4) were recorded. These species are listed in **Table 4.3** in **Annex 7A.4**.

1.5.46. Redwing and fieldfare are widespread Winter visitors that utilise hedgerow and woodland for foraging and are included on Schedule 1 due to the rarity of breeding within the UK, with both species breeding in north Scotland only. All of the species recorded are considered to be using the site as a Winter foraging resource

vii. Bats

1.5.47. The desk-study identified 63 records of bat species within the species-specific Zols as detailed in **section 3**. Species recorded comprised Natterer's bat, noctule, common pipistrelle, soprano pipistrelle, Nathusius' pipistrelle, serotine, barbastelle and brown long-eared bat. Records were also identified for unspecified species within the *Myotis* spp. and *Pipistrellus* spp. groups.

1.5.48. Seventeen records, for four species (Natterer's bat, soprano pipistrelle, serotine and brown long-eared bat) and an unidentified *Pipistrellus* spp., were identified relating to bat roost locations, with further information identifying eight as breeding roosts and one as a hibernation roost. None of the roost records were located within the site boundary with the closest roost records located 620m to the north-east within Marlesford (a serotine roost and a brown long-eared bat roost).

1.5.49. Breeding roosts were identified within the relevant Zols for Natterer's bat, soprano pipistrelle, brown long-eared bat and an unidentified Pipistrellus spp., with the closest located 850m to the east within Marlesford (brown long-eared bat). A single hibernation roost was identified, for Natterer's bats, and was located approximately 1.5km to the north in Parnham.

1.5.50. No activity records were identified within the site boundary with the closest record, for a brown long-eared bat, located approximately 680m to the east within Marlesford.

1.5.51. A summary of the results of bat surveys at the site is provided below. Full details of the results of bat surveys at this location are provided in **section 5** of **Annex 7A.4**.

1.5.52. A single tree, a mature Oak (Target Note 8), with features suitable for roosting bats was identified within the site during the 2014 Extended Phase 1 habitat survey/protected species survey. Three woodland blocks (Target Note Target adjacent to the site boundary, two of which (Target Note 5 and Target Note 9) contain trees with the potential to support roosting bats. A further woodland block (Target Note 10), approximately 300m to the west of the site

boundary was also considered to have trees with the potential to support roosting bats.

1.5.53. Whin Belt was assessed as containing primarily semi-mature Oak and Ash with several potential roost features identified, including rot holes, limb tear-off wounds and dead wood. The mixed broad-leaved woodland block to the north of Whin Belt (Target Note 5 on **Figure 7.2** in **Annex 7A.1**) similarly contained primarily semi-mature trees, including oak and ash; these included several large, mature trees with features suitable for roosting bats, including dead wood, limb tear-off wounds and pruning wounds. The woodland block adjacent to the eastern boundary of the site (Target Note 1 on **Figure 7.2** in **Annex 7A.1**) was assessed as young plantation mixed broad-leaved woodland. The trees present within this woodland were all of a fairly small size, being approximately 10-20 years old. No obvious bat roost potential was identified.

1.5.54. A further specific bat tree assessment survey identified 25 features on 13 trees as potentially suitable for roosting bats. Eleven trees were located within or immediately adjacent to the site boundary, with woodland blocks located to the west and east. The location of assessed trees and woodland blocks is illustrated on **Figure 7.7** in **Annex 7A.1**. A summary of the results of this survey is provided in **Table 1.6**.

Table 1.6: Summary of bat tree assessment results

Tree roost assessment level	Number of features identified
High potential	12
Medium potential	4
Medium/Low potential	1
Low potential	6
Unable to assign potential level	2
High potential	12

1.5.55. Survey work has not confirmed the likely presence of roosting bats in close proximity to the site. Low numbers of bats were recorded in the 20 minutes following sunset during both the activity and static detector surveys. This activity exclusively consisted of big bat[6], primarily noctule, and pipistrelle species passes. While noctule bats primarily roost in trees (Ref 1.19), pipistrelle species primarily roost in buildings, and are therefore less likely to be roosting within woodland in the vicinity of the site (Ref 1.20) (Ref 1.21). Noctule and pipistrelle species are known to be early-emerging species,

[6] 'Big bat' is a group classification consisting of noctule, Leisler's bat and serotine. These species are often grouped due to the similarities and overlapping characteristics of their echolocation calls making species-specific identifications difficult and unreliable.

sometimes leaving the roost prior to sunset (Ref 1.19). The presence of these species within the site in the 20 minutes following sunset is not necessarily indicative of roost(s) of these species in woodland immediately adjacent to the site.

1.5.56. During bat activity surveys, at least seven species were recorded with pipistrelle species (common pipistrelle, soprano pipistrelle, and calls assigned to the *Pipistrellus* species group) the most frequently recorded. All other species were recorded at only very low levels.

1.5.57. Activity transects are shown on **Figure 7.8** in **Annex 7A.1**. Recorded activity across Transect 2 (within the site boundary), was, with the exception of the October 2014 survey, largely consistent across all survey months with levels of activity between 6 bat passes per hour (B/h) and 10B/h. During the October 2014 dawn survey, no bat passes were recorded for any species. Activity recorded across Transect 1 was noticeably more varied, activity levels peaked in June 2014 (28B/h) with relatively high activity levels also recorded during August 2014 (15B/h). As with Transect 2, activity levels were reduced during the October 2014 dawn survey (2B/h) when only soprano pipistrelle were recorded.

1.5.58. A single pass was recorded in the 20 minutes following sunset, potentially indicating emergence. This was a noctule recorded 8 minutes after sunset during July 2014 to the west of a woodland block at the northern edge of the site, on Transect 1. However, as an early-emerging species, this pass does not necessarily mean an emergence from habitats within the site boundary.

1.5.59. The location of recorded bat passes on Transects 1 and 2 within the site are provided on **Figures 7.9** to **7.13** in **Annex 7A.1**.

1.5.60. Six species were recorded during the course of static[7] bat detector surveys: Natterer's bat, noctule, common pipistrelle, soprano pipistrelle, Nathusius' pipistrelle, serotine and barbastelle as well as unidentified species belonging to four bat species groups (common/soprano pipistrelle, *Myotis* spp., *Plecotus* spp., and big bat[8]). Recorded activity levels largely reflected those recorded during transect surveys with activity dominated by common and soprano pipistrelle at all static detector locations during all survey visits. Nathusius' pipistrelle activity was significantly lower with Nathusius' pipistrelle calls recorded inconsistently and at only very low levels.

[7] A static bat detector is programmed to come on during darkness and switch off during daylight and records bats echolocating. They are left in situ for up to 5 consecutive nights.

[8] The big bat species grouping comprises Noctule, Leisler's and serotine which are difficult to identify by echolocation calls alone. There is a degree of overlap between the parameters of all three species and so there are sometimes calls that cannot confidently be assigned to an individual species, in which case we call them big bat.

1.5.61. Similarly, low levels of activity were recorded for *Myotis* spp., *Plecotus* spp., and big bat across all survey visits and locations. Barbastelle, while generally recorded at low levels recorded a peak in activity at static monitoring location (MS02) with an average of 10.17 passes per night recorded during the survey period between 27 August and 3 September 2014. Although only low numbers of barbastelle were recorded during activity transects (three passes across all survey visits), this peak corresponds to the timing of the static detector recordings.

viii. Terrestrial mammals

1.5.62. The desk-study revealed 42 records of terrestrial mammals within 2km of the site boundary. Species recorded comprised European otter (*Lutra lutra*), badger, Western European hedgehog (*Erinaceus europaeus*), brown hare (*Lepus europaeus*) and water vole (*Arvicola amphibius*).

1.5.63. Four of the badger records were for setts located 180 to 400m west of the site boundary in Chris Covert or Colford Grove. The other two badger records were located approximately 2km to the east of the site. Sixteen of the 17 otter records were associated with the river Deben to the south and river Ore to the north of the site boundary. The remaining record was situated between the two rivers. Of the nine records of water vole, five were on or close to the river Deben and between 500m to 1.6km from the site boundary, and four were on or close to the river Ore, between 600m and 1.7km from the site.

1.5.64. Five records of brown hare were between 300m and 2.0km from the site boundary. Five records of hedgehog were between 500m to 2.2km to the west or south-west of the site. Small numbers of brown hares (two to three individuals) were observed during both the Phase 1 habitat survey and subsequently during the breeding bird surveys. The arable and hedgerow habitat present provide potentially suitable habitat for hares and this species could be present within the site boundary. The Suffolk BAP (Ref 1.16) states that brown hare is widespread in Suffolk; however, recent reports in the east of England in 2018 suggest brown hare are suffering from a disease epidemic with records of sick or dead animals (Ref 1.22), and with rabbit haemorrhagic disease type 2 now confirmed in brown hare from Dorset and Essex (Ref 1.23).

1.5.65. During the extended Phase 1 habitat survey/protected species walkover, no habitat suitable for otters or water voles was identified within the site. A (potential main) badger sett was identified, with at least five active entrances and two disused entrances, approximately 130m from the site boundary. A badger latrine was identified at the base of a hedgerow at Target Note 11. However, the sett is located approximately 130m away and therefore will not be directly affected by the development proposals.

1.6 Baseline conditions – Ecological features and their importance

a) Assessment methodology

1.6.1. The purpose of this final section is to describe the distribution and relative abundance of the habitats and species present within the ZoI of the site boundary, and to use this information, in the context of their wider distribution, to assess the importance of the habitats and species that could be affected by the proposed development. This assessment will then be used, in conjunction with a description of the extent and magnitude of the predicted impacts of the scheme, to carry out the detailed ecological impact assessment presented in **Chapter 7**.

1.6.2. To comply with both the CIEEM Guidelines for Ecological Impact Assessment (Ref 1.5) and with the standard EIA methodology used elsewhere within the ES, both methodologies have been used to assess the habitats and species within the ZoI of the site.

1.6.3. Under the CIEEM guidelines (Ref 1.5), the first stage is to identify IEFs, to include habitats, species and ecosystems, including ecosystem function and processes, with reference to the geographical context in which they are considered important. An assessment is then made of whether these IEFs will likely be subject to impacts and, if so, these are taken forward into the EcIA as a material consideration in the planning decision. Where protected species are present and there is the potential for a breach of the legislation, those species are also considered to be IEFs to be included in the EcIA.

1.6.4. Those IEFs that qualify purely on the basis of legislative considerations (such as badgers) rather than as a result of their conservation status, are addressed separately in the EcIA from those that are of material concern, with the latter being assessed in greater detail. For both, the ES will outline what measures are required to prevent any contravention of the legislation.

1.6.5. In line with the CIEEM guidelines, the importance of an ecological feature, as determined with reference to legal, policy and/or nature conservation considerations, has been assessed within the following geographical context:

- International and European importance;
- National importance (i.e. UK or England);
- Regional importance (i.e. the East of England);
- County importance (i.e. Suffolk); and

- Local importance (within ZoI of the scheme).

1.6.6. The following table has also been used in order to assess the ecological features in accordance with the wider EIA methodology (**Table 1.7**).

Table 1.7: Criteria for assessment of ecological importance.*

Importance	Criteria	
High	International; UK; National (England)	Very high importance and rarity. Feature/resource possesses key characteristics which contribute significantly to the distinctiveness, rarity and character of the site (for example designated features of international/national importance, such as SACs, SPAs, Ramsar sites and SSSIs.
Medium	Regional (East Anglia); County (Suffolk)	Medium importance and rarity, regional scale. Feature/resource possesses key characteristics which contribute significantly to the distinctiveness and character of the site/receptor (for example designated features of regional or county importance, such as CWSs, County BAP habitats, etc.).
Low	Local - district/ borough (Suffolk Coastal)	Low or medium importance and rarity, local scale. Feature/resource possesses characteristics which are only locally significant. Feature/resource not designated or only designated at a district or local level (for example local nature reserve).
Very low	Within the ZoI	Feature/resource characteristics do not make a significant contribution to local character or distinctiveness. Feature/resource not designated.

*As part of the assessment process, the sensitivity of the ecological features should also be assessed. Sensitivity has not been addressed within the ecological baseline. Sensitivity and a detailed rationale explaining how a particular sensitivity rating has been arrived at for each ecological feature will be dealt with in the Environment Statement. [Note that Importance and Sensitivity should be assessed separately, as they are to an extent independent of each other (e.g. a feature of high value could be of low sensitivity, and vice versa)].

b) Description and assessment of ecological features

1.6.7. This section sets out the relevant ecological features and their importance and discusses each in turn. For each feature, its importance is described by:

- Description and distribution: the habitat or species are described in terms of its distribution and abundance locally, regionally and nationally.

- Assessment: the habitat or species is described by its protected/nature conservation status, and other measures of value, to determine its relative importance both in terms of the CIEEM guidelines and the wider EIA assessment methodology.

1.6.8. As outlined in **section 2,** the legislative and policy framework for each ecological receptor is considered in full and, together with professional judgement, is used to assign a value to each ecological receptor. This technical appendix gives a detailed rationale for the value assigned to each ecological receptor and the conclusions reached.

i. Feature: Designated sites

Description and distribution

1.6.9. No statutory designated sites were identified within a 5km radius of the site boundary.

1.6.10. Seven non-statutory CWS were identified within a 2km radius of the site boundary; these sites are detailed in **Table 1.2**.

Assessment

1.6.11. Given that:

- CWSs and their cited interest features within 2km of the site are designated on the basis of habitats, plant, reptile and/or bird assemblages of county importance; however
- the distance of these sites and the site, along with the implementation of primary and tertiary mitigation measures, ensures there are no direct or indirect impacts on these desginated sites;

then these sites within the ZoI would:

- be an IEF at the county level under the CIEEM guidelines (Ref 1.5);
- be of medium importance, following the EIA-specific assessment methodology; but
- scoped out of the detailed assessment as there would be no direct or indirect impacts.

ii. Feature: Plants and habitats

Description and distribution

1.6.12. Arable habitat is widespread is Suffolk and no botanically rich arable margins were identified within the site boundary. A small section of species-rich hedgerow (H5) (approximately 40m) would be lost to allow for the access

road. Hedgerows are on Suffolk's Priority Species and Habitats list (Ref 1.14), on Section 41 of the NERC Act (Ref 1.13), and have been targeted for action in the Suffolk BAP (Ref 1.24). At the last assessment (2004), here were an estimated 12,500 to 15,000km of species-rich hedgerow in the county (Ref 1.24). Two species-rich hedgerows were identified within the site boundary, the remainder being species-poor.

1.6.13. Whin Belt and Wonder Grove were identified as broadleaved woodland approximately 2ha in extent and this habitat is on Suffolk's Priority Species and Habitats list (Ref 1.14) and Section 41 of the NERC Act (Ref 1.13). Neither woodland has been recorded on the ancient woodland inventory and are therefore likely to be relatively recent in origin. At the last assessment (2007), the Suffolk broadleaved woodland BAP estimated there were 15,466ha of deciduous woodland within Suffolk (Ref 1.25).

1.6.14. Ponds are a habitat on Suffolk's Priority Species and Habitats list (Ref 1.14) and Section 41 of the NERC Act (Ref 1.13). There is one pond (Pond 59) located within the site boundary while two other ponds are outside of the site boundary (Pond 60 and 61). Pond 59 was dry at the time of survey and will be retained as part of the proposed development and is not considered a significant contributor to the wider pond assemblage.

Assessment

1.6.15. Given that:

- arable habitat is widespread in Suffolk and no botanically rich margins were identified;
- while a small section of species-rich hedgerow would be lost to allow for an access road, hedgerows are widespread in Suffolk;
- the pond on site will be retained within the development and is not considered a significant contributor to the wider assemblage of ponds. In addition, there will be a 10m buffer and 3m high soil storage bund screening this pond from the proposed development; and
- both Whin Belt and Wonder Grove are limited in extent, not of high value and would be retained.

then the habitats present within the ZoI would:

- not be an IEF under the CIEEM guidelines (Ref 1.5); and

- be of very low importance, following the EIA-specific assessment methodology.

iii. Feature: Invertebrates

Description and distribution

1.6.16. No desk-study records of scarce or invertebrate were identified within the site boundary, except for two aquatic beetles (*Nebrioporus* (*Nebrioporus*) *elegans* and *Gyrinus aerates*) which could potentially be present in Ponds 60 and 61. Both ponds are outside the site boundary and will not be affected by the proposed development. Overall, the habitats within the site boundary consist primarily of intensively managed arable fields and no habitats of particular value to invertebrate species have been identified.

Assessment

1.6.17. Given that:

- arable habitat is widespread in Suffolk and no botanically rich margins or other habitat features of value to invertebrate species were identified; and

- both ponds where the aquatic beetles may be present would be retained and not affected by the proposed development.

then the invertebrate assemblage within the ZoI would:

- not be an IEF under the CIEEM guidelines (Ref 1.5); and

- be of very low importance, following the EIA-specific assessment methodology.

iv. Feature: Amphibians

Description and distribution

1.6.18. Surveys of water bodies within the site and wider study area were carried out in 2014, and desk-study records were also obtained for amphibians within 2km of the site boundary. Two ponds (Ponds 60 and 61) both had HSI scores of 'Below Average' suitability for great crested newts and no great crested newts were recorded during surveys. The site comprised large arable fields, with good field margins and small areas of woodland. Although there was suitable terrestrial habitat for great crested newts, the ponds had poor water quality, excessive shading and heavy algal cover. Surveys revealed no great

crested newts in either ponds, although small numbers of smooth newt, palmate newt and common frogs were found. The nearest pond containing desk-study records of great crested newts was 1.6km to the north.

1.6.19. A review of the Suffolk BAP identified great crested newts as a priority species for conservation action in the county (Ref 1.14). Great crested newts are protected under Schedule 5 of the Wildlife and Countryside Act (Ref 1.3), and Schedule 2 of the Conservation of Habitats and Species Regulations (Ref 1.11), and are included within Section 41 of the NERC Act (Ref 1.13), which identifies them as species of principal importance for the purpose of conserving biodiversity in England.

1.6.20. Other amphibians recorded within the ZoI included smooth newt (*Lissotriton vulgaris*) which is not on Suffolk's Priority Species and Habitats list (Ref 1.14).

Assessment

1.6.21. Given that the great crested newt:

- no great crested newts were found within 500m of the site boundary; and
- only small numbers of smooth newts were found within ponds on the site, and the habitat is considered sub-optimal.

then the amphibian assemblage within the ZoI would:

- not be an IEF under the CIEEM guidelines (Ref 1.5); and
- be of very low importance, following the EIA-specific assessment methodology.

v. Feature: Reptiles

Description and distribution

1.6.22. On the basis of the extended Phase 1 habitat survey/protected species walkover, there is only a small area of suitable habitat for reptiles within the site boundary, as most of the site is arable fields. There are no desk-study results of reptiles nearer than 600m. The available habitat to support reptile species is considered to be extremely limited and the site considered to be of little value to reptile species. If present, reptiles are only likely to occur in small numbers.

1.6.23. A review of Suffolk's Priority Species and Habitats list identified adders, grass snakes, common lizards and slow-worms as a priority species (Ref 1.14). In addition, adders, grass snakes, common lizards and slow-worms are included within Section 41 of the NERC Act (Ref 1.13).

Assessment

1.6.24. Given that:

- no desk-study records were found for the presence of reptiles within 500m of the site, and the habitat is considered sub-optimal;

then the reptile assemblage within the ZoI would:

- not be an IEF under the CIEEM guidelines (Ref 1.5); and
- be of very low importance, following the EIA-specific assessment methodology.

vi. Feature: Birds

Description and distribution

1.6.25. Only two Schedule 1 species of the Wildlife and Countryside Act (Ref 1.3) redwing and fieldfare, were recorded during the Winter bird surveys. None were recorded during the breeding season surveys. Redwing and fieldfare are widespread Winter visitors that utilise hedgerow and woodland for foraging and are included on Schedule 1 due to the rarity of breeding occurring within the UK, breeding in Scotland only.

1.6.26. A total of 15 species listed on either Section 41 of the NERC Act (Ref 1.13) and/or included on the Red List or Amber List of BoCC (Ref 1.4) were observed during the breeding and the wintering bird surveys. The majority of these species are considered likely to be breeding and to be present during the Winter months too.

1.6.27. Arable farmland is extensive within Suffolk and the distribution of farmland bird species such as the red listed species discussed above will to a large extent be dependent on the diversity of the arable habitat. Fields with large diverse margins or crops sown to benefit as wild birds are likely to support a greater number and diversity of bird species than intensively managed arable farmland.

Assessment

1.6.28. Given that:

- no Schedule 1 breeding bird species of the Wildlife and Countryside Act (Ref 1.3) were recorded; and
- the intensively managed arable habitat, and the breeding and wintering bird assemblage it supports is widespread in Suffolk and that the arable habitat is not being managed specifically to benefit breeding birds.

notwithstanding the legal protection afforded to breeding bird species, then the breeding and wintering bird assemblage within the ZoI would:

- not be an IEF under the CIEEM guidelines (Ref 1.5); and
- be of low importance, following the EIA-specific assessment methodology.

vii. Feature: Bats

Description and distribution

1.6.29. At least eight species of bats were reported within the desk-study; however, no records were identified within the site boundary. The closest records were a roost 620m north-east and recorded activity 850m east of the site.

1.6.30. Assessments of tree roost potential identified a number of features with the potential to support roosting bats; however, these were largely located outside of the site boundary and no signs of current occupation by bats were identified.

1.6.31. Habitat within the site boundary primarily consists of open arable land of limited value for bats, though hedgerows would be of value to foraging bats. Activity and static detector surveys identified, with the exception of common and soprano pipistrelle activity, primarily low levels of bat activity, although this activity did include the nationally rare barbastelle.

Assessment

1.6.32. Given that:

- Barbastelle are active within the site boundary (at only a low level), are nationally rare with a restricted distribution, and that the species are listed on Suffolk's Priority Species and Habitats list (Ref 1.14), Section 41 of the NERC Act (Ref 1.13) and on Annex II of the Habitats Directive (Ref 1.7) It is considered that barbastelle are likely to be using the ZoI of the proposed development (defined as 10km for barbastelle) for foraging and roosting (all types).

- Natterer's bat roosts (maternity and hibernation) are known to be present within the ZoI (defined as 4km for Natterer's bat), and this species is common and widespread in the UK and within Suffolk. However, this species was recorded in only very low numbers on site and habitats within site boundary and immediately adjacent habitats are unlikely to be relied on by Natterer's bat for foraging or roosting (all types).

- Noctule may roost (all types) and forage within the ZoI (defined as 4km for noctule). Noctule are widespread in Suffolk and were recorded in only low to moderate numbers on the site. The species are unlikely to be reliant on habitat within the site boundary or habitat immediately adjacent, and roosting (all types) is unlikely within the site.

- Common and soprano pipistrelle may roost (all types) and forage within the ZoI (defined as 2km and 3km for common and soprano pipistrelle respectively), however habitat within the site is largely unsuitable for both foraging and roosting (all types).

- Nathusius' pipistrelle may roost (all types) and forage within the ZoI (defined as 3km for Nathusius' pipistrelle). However, the species is scarce in Suffolk, having only recently been classified as a resident rather than a migrant winter visitor. Nathusius' pipistrelle was recorded in only very low numbers on the site and habitat within the site boundary is unlikely to support roosting (all types) or foraging.

- Serotine roosts of unknown type(s) are present within the ZoI (defined as 4km for serotine) and Serotine are widespread in Suffolk. The species was recorded in only very low numbers on the site however, and habitats within the site boundary and immediately adjacent habitats are unlikely to be relied on by serotine for foraging or roosting (all types).

- Brown long-eared bats are often under-recorded, and the species is common and widespread in the UK and within Suffolk. Although maternity roosts are known to be present within the ZoI (defined as 3km for brown long-eared bat), the species was recorded in only very low numbers within the site boundary. Habitat within the site is unlikely to support roosting (all types) or foraging.

then the bat assemblage within the ZoI would be:

- an IEF at a county level under CIEEM guidelines (Ref 1.5); and

- of low importance, following the EIA-specific assessment methodology.

1.6.33. Full details of the criteria considered during the assessment of bats at the site are provided in **Table 1.8** to **Table 1.10**.

Table 1.8: Criteria for assessing the importance of the bat species within the ZoI of the Project. Note that ZoI differs between species

Source of data	**Published data**		**Information derived from project data (inc local desk-study information) supported by professional judgement based on known species ecological traits**			
KEY to SCORE	Conservation status	Status UK/Suffolk	Status within the site	Breeding roosts (maternity) within the ZoI	Hibernation within the ZoI	Use of habitats within the ZoI for foraging/ commuting
Red [score 3]	+ Habs. Dir. Annex II [additional importance applied if species is qualifying feature of a SAC]	Nationally rare	Population apparently centred on the site (for at least part of the year); 50+ individuals rarest/rarer species	Maternity colony of rarest/rarer species within the site	Majority of individuals likely to hibernate within the site and adjacent areas.	High reliance on habitats present within the site (inside or outside the construction site boundary).
Amber [score 2]	+ NERC Act	Nationally uncommon /less common	Fewer than 50 rarest/rarer species; 50+ more common species. *Note these are very broad estimates.*	Maternity colony of more common species within the site; rarer species outside the site but within ZoI	Hibernation within ZoI very likely; within the site probable	Moderate reliance on habitats present within the site (based on data and species preferences); higher reliance on habitats outside of the site
Green [score 1]	EPS only	Common/ widespread	Present in lower numbers than above (in low or very low numbers).	No evidence of maternity roost within the site; more common species outside the site but within ZoI	Majority of individuals are likely to hibernate outside the site (or outside the ZoI)	Low reliance on habitats present within the site; species considered to be generalist and adaptable.

Table 1.9: Summary of geographical importance boundaries

Geographic importance: Local	Geographic importance: County	Geographic importance: Regional	Geographic importance: National
A score of 6-10 This matrix does not allow for finer definitions of 'Local' importance (district, borough, ZoI, site) for which professional judgement is required.	A score of 11 to 13	A score of 14 to 16	A score of 17+ International if species is qualifying feature of a SAC
	The boundaries between these are subjective based on an even distribution of possible scores between the three categories.		

Table 1.10: Summary of the elements considered in determining the geographical context (Ref 1.5) of each species' importance.*

Species**	Conservation Status	Status UK/Suffolk (Ref 1.26)	Recorded Activity within the site	Breeding Roosts (maternity)	Hibernation	Use of habitats for foraging/commuting	Geographic context of importance
Barbastelle	Habs. Dir. Annex II EPS NERC Act	Nationally rare	Recorded in only very low numbers within Site. Never exceeding 2% (or 0.2 B/h) of total bat activity on static detectors.	No evidence within the site and largely unsuitable. Adjacent woodland blocks have a limited number of trees with features preferred by barbastelle. Woodland blocks in ZoI may support breeding roost(s).	No evidence within the site and largely unsuitable. Adjacent woodland blocks have a limited number of trees with features preferred by barbastelle. Habitats in ZoI may support hibernation roost(s).	Habitats within the site unsuitable. Habitat mosaic in ZoI offers reasonable connectivity and foraging opportunities.	County (score of 10)
Natterer's bat	EPS	Nationally common, widespread in the UK/Suffolk	Very low numbers recorded within the site identified	No evidence within the site and activity suggests unlikely	No evidence within the site and hibernation preferences strongly	Known to use a wide range of habitats.	Local (score of 6)

Species**	Conservation Status	Status UK/Suffolk (Ref 1.26)	Recorded Activity within the site	Breeding Roosts (maternity)	Hibernation	Use of habitats for foraging/commuting	Geographic context of importance
			specifically to Natterer's bat[9].	within the site or adjacent habitat. Maternity roost identified within the ZoI with a variety of potential roost resources also present.	indicate unlikely within the site or immediately adjacent habitats. Hibernation roost identified within the ZoI (approximately 1.7km north)	Proposed development site open and sub-optimal. May use adjacent woodland blocks but unlikely to be large enough for reliance. The ZoI may provide habitat on which Natterer's bat rely.	
Noctule	EPS NERC Act	Common and widespread in UK and Suffolk	Recorded in low to moderate numbers within the site[10].	Woodland blocks with some roost potential adjacent to the site. Woodland blocks within ZoI may support breeding roost(s).	Woodland blocks with some roost potential adjacent to the site. Woodland blocks with ZoI may support hibernation roost(s).	Use almost all landscape types and less reliant on linear features. Unlikely to be heavily reliant on the Site or immediately adjacent habitats but ZoI may provide habitats on which noctule rely.	Local (score of 8)
Common pipistrelle	EPS	Common and widespread in the UK and Suffolk	Common and widespread across site.	Habitat within the site largely unsuitable.	Few winter roosts are known; these tend to be solitary individuals.	Generalist, widespread and common.	Local (score of 6)

[9] Note. Moderate numbers of *Myotis* spp. calls were recorded but most could not be identified to a specific species.
[10] Note 'big bat' may contain additional noctule passes that cannot be identified to a specific species.

Species**	Conservation Status	Status UK/Suffolk (Ref 1.26)	Recorded Activity within the site	Breeding Roosts (maternity)	Hibernation	Use of habitats for foraging/commuting	Geographic context of importance
				Adjacent woodland blocks have some features potentially suitable. Zol contains a variety of potential roost resources	Hibernation within tree roosts within adjacent woodland blocks and/or Zol possible.		
Soprano pipistrelle	EPS NERC Act	Common and widespread in UK and Suffolk	Common and widespread across site.	Habitat within the site largely unsuitable. Adjacent woodland blocks have some features potentially suitable. Maternity roost identified in the Zol with a variety of potential roost resources also present.	Few winter roosts are known; these tend to be solitary individuals. Hibernation within tree roosts within adjacent woodland blocks and/or Zol possible.	Generalist, through with a bias towards riparian habitats	Local (score of 7)
Nathusius' pipistrelle	EPS	Uncommon, sparse in Suffolk, under-recorded	Recorded in only low numbers	No evidence within the site and largely unsuitable. Woodland blocks immediately adjacent have some features potentially suitable.	No evidence within Site. No evidence within the site and largely unsuitable. Woodland blocks immediately adjacent have some features potentially suitable.	Generalists, though with a bias towards riparian habitats.	Local (score of 7)

Species**	Conservation Status	Status UK/Suffolk (Ref 1.26)	Recorded Activity within the site	Breeding Roosts (maternity)	Hibernation	Use of habitats for foraging/commuting	Geographic context of importance
				The Zol contains a variety of potential roost resources.	The Zol contains a variety of potential roost resources.		
Serotine	EPS	Uncommon up widespread in Suffolk	Recorded in very low numbers (approximately 1% of total bat activity) [11].	No evidence within the Site and roosting preference for buildings strongly indicate unlikely within the site. Roosts of unknown type present within the Zol with a variety of potential roost resources also present.	No evidence within the Site and roosting preference for buildings strongly indicate unlikely within the site. Roosts of unknown type present within the Zol and a variety of potential roost resources also present.	Proposed development site open and sub-optimal. Adjacent woodland blocks unlikely to be large enough for reliance. Zol may provide habitat on which serotine rely.	Local (score of 7)
Brown long-eared bat	EPS NERC Act	Common and widespread in UK and Suffolk	Recorded in very low numbers[12].	No evidence within the site and largely unsuitable. Woodland blocks immediately adjacent have some features potentially suitable. Two maternity colonies identified within the Zol	No evidence within the site and largely unsuitable. Use a range of habitats for hibernation so may hibernate within Zol.	Often under-recorded generalist.	Local (score of 7)

[11] Note. 'big bat' calls may contain serotine passes that cannot be identified to the species level.
[12] Note that this species is often under-recorded due to the nature of its echolocation calls.

Species**	Conservation Status	Status UK/Suffolk (Ref 1.26)	Recorded Activity within the site	Breeding Roosts (maternity)	Hibernation	Use of habitats for foraging/commuting	Geographic context of importance
				with a variety of potential roost resources also present.			

*The different elements that make up the assigned 'importance' have been broadly categorised and colour-coded to show how each element contributes to the assessment (key provided in Table 1.8 above: Red scores 3; Amber scores 2; Green scores 1).

**Only those species for which calls were identified to the species level are considered in this table. Species groups are not considered here due to the variation in the considered parameters (in each column) between species within a species group. For example, no calls were assigned by the auto-ID software to Daubenton's bat within *Myotis* spp. group (this is not unusual, as Myotis calls are rarely possible to identify to a species). However, those calls identified as Myotis are more likely to be Natterer's bat (and therefore are included within the Natterer's bat assessment above) because of the lack of suitable habitat for Daubenton's bat.

viii. Feature: Terrestrial mammals

Description and distribution

1.6.34. There are badger setts within 130 to 400m of the site (from desk-study and survey records), but no evidence of badger setts within the site boundary. The arable fields of the site are considered as sub-optimal habitat for badgers, although the field margins, and an area of tall ruderal herbs at the west corner of Whin Belt, the track to, and margins of the small patch of woodland to the north of Whin Belt, and the disused pit area to the south of Whin Belt provide potential foraging habitat. Surveys of badger setts across England and Wales between 2011 and 2013, concluded there had been a 103% increase in social groups over the last 25 years (Ref 1.27) (Ref 1.28). There has also been an increase in Suffolk's badger population since the 1980s (Ref 1.29). Therefore, badgers are not a species of conservation concern.

1.6.35. No desk-study records for either otter or water vole were found within the site and no habitat suitable for otters or water voles was identified within the site boundary during the survey, these species have therefore been scoped out of further assessment.

1.6.36. In Britain, brown hares are usually associated with lowland pasture and arable farmland, feeding mainly on grasses and herbs as well as agricultural crops. Woods and hedgerows also provide day-time shelter, particularly in Winter (Ref 1.30). Although there were no desk-study records of brown hare within the site, the habitat is potentially suitable for brown hares and two to three individuals were recorded on a number of occasions. Brown hare is widespread in Suffolk (Ref 1.31); however, recent reports in the east of England in 2018 suggest brown hare are suffering from a disease epidemic with records of sick or dead animals (Ref 1.22). The two to three individuals recorded on site would not comprise a significant contribution to the wider population of this highly mobile species.

1.6.37. Desk-study records demonstrated records for hedgehog within the ZoI. Hedgehogs occur in a wide variety of habitat types including grasslands, forests and suburban areas (Ref 1.32). However, the majority of the site is arable fields, and so unsuitable for hedgehogs, and there were no records of hedgehogs during surveys.

Assessment

1.6.38. Given that:

- there was an absence of current survey records for badgers within the site boundary;

then the badgers within the ZoI would:

- not be an IEF under the CIEEM guidelines (Ref 1.5); and
- be of very low importance, following the EIA-specific assessment methodology.

1.6.39. Given that:

- the brown hare is on Suffolk's Priority Species and Habitats list (Ref 1.14) and is listed on the NERC Act (Ref 1.13);
- exist within the site and has suitable habitat both within the site and the wider area; and
- the population on site (two to three individuals) would not be a significant contribution to the wider population of this highly mobile species.

then the brown hares within the ZoI would:

- not be an IEF under the CIEEM guidelines (Ref 1.5); and
- be of low importance, following the EIA-specific assessment methodology.

1.6.40. Given that:

- there was an absence of desk-study and survey records for hedgehogs within the site boundary, and an absence of suitable habitat for them

then the hedgehogs within the ZoI would:

- not be an IEF under the CIEEM guidelines (Ref 1.5); and
- be of very low importance, following the EIA-specific assessment methodology.

c) Summary of ecological features/receptors

1.6.41. Following a review of the known baseline within the ZoI, **Table 1.11** lists the ecological features/receptors and details which will be carried forward into the detailed assessment. Those carried forward are IEFs of sufficient

conservation value that will be sufficiently affected by the proposed development to require material consideration within the assessment.

1.6.42. There are a number of ecological receptors that, while not of significant nature conservation value within the Zol, do require some consideration because of the legislative protection afforded to them. While not taken forward for detailed assessment, these are considered further in the ES, where appropriate secondary mitigation is prescribed to ensure legislative compliance.

Table 1.11: Determination of IEFs to be taken forward for detailed assessment

Feature/Receptor	Importance (CIEEM/ EIA Methodology)	Justification	Scope in/Out
Non-statutory designated sites within 2km of the site boundary	County/Medium	CWSs support a range of habitats types that are listed on Section 41 of the NERC Act (Ref 1.13) and which are targeted for action in the Suffolk BAP (Ref 1.16). Given the distance of these designated sites from the site (the closest of which is 430m away) and the implementation of the primary and tertiary mitigation measures detailed in **section 7.5** of **Chapter 7,** no direct or indirect impacts are anticipated on the statutory and non-statutory designated sites. All seven CWSs (Catt's Wood, Great Wood Glevering Hall, Lower Hacheston Meadow, The Oaks, Copperas Wood, Ashe Abby Decoy Pond, and River Deben) have therefore been scoped out of the detailed assessment.	Scoped out
Hedgerows	Local/Low	Hedgerows are a habitat listed on Suffolk's Priority Species and Habitats list (Ref 1.14). A short section of hedgerow (approximately 40m), qualifying as 'important' under the Hedgerows Regulations (Ref 1.2) would be lost during the construction of the proposed development. Remaining hedgerows would be retained as part of the primary mitigation measures as detailed in **section 7.5** of **Chapter 7**. Hedgerows are widespread in Suffolk and it is not considered that the loss of a small section of hedgerow qualifying as 'important' at this location would result in a significant impact. In addition, landscape planting described under primary mitigation in **section 7.5** of **Chapter 7** would offset the loss of hedgerow. Hedgerows are therefore scoped out of the detailed assessment.	Scoped out
Pond	Local/Low	Ponds are a habitat listed on Suffolk's Priority Species and Habitats list (Ref 1.14). Pond 59 located within the site is to be retained and a buffer of over 10m maintained between the pond, the construction work, and the proposed perimeter fence, as part of the primary mitigation measures detailed in **section 7.5** of **Chapter 7**. This pond was found to be dry at the time of the surveys and therefore not likely to support great crested newt. Therefore, with the inclusion of the primary and tertiary mitigation measures detailed in **section 7.5** of **Chapter 7,** it is considered that there would not be any significant effects on this receptor as a result of the proposed development. Ponds are therefore scoped out of the detailed assessment.	Scoped out

Feature/Receptor	Importance (CIEEM/ EIA Methodology)	Justification	Scope in/Out
Arable fields	Local/Very Low	Arable habitat is widespread in Suffolk and generally of limited ecological value. In addition, no botanically rich margins were identified during surveys. This habitat type has therefore been scoped out of the detailed assessment	Scoped out
Broadleaved woodland	Local/Very Low	All identified woodland blocks are external to the site boundary and will be retained in their entirety. A buffer of 10m between the woodland and the proposed perimeter fence would be maintained as part of the primary mitigation measures detailed in **section 7.5** of **Chapter 7**. Therefore, it is considered that there would not be any significant effects on this receptor as a result of the proposed development. Broadleaved woodland has therefore been scoped out of the detailed assessment.	Scoped out.
Amphibians	Local/Very Low	No great crested newts were recorded within 500m of the site, and only small numbers of other amphibians (common frog, smooth and palmate newts) were found within ponds within the study area. These species are not on Suffolk's Priority Species and Habitats list (Ref 1.14). Amphibians have therefore been scoped out of the detailed assessment.	Scoped out
Reptile assemblage	Local/Low	All four common, native reptile species (adder, common lizard, grass snake and slow-worm) are protected under Schedule 5 of the Wildlife and Countryside Act (Ref 1.3) and are included on Section 41 of the NERC Act (Ref 1.13) and on Suffolk's Priority Species and Habitats list (Ref 1.14). While a limited amount of habitat with the potential to support reptiles would be lost, habitats within the site were largely sub-optimal for reptiles and therefore it is not considered that any significant effects would occur on this receptor as a result of the proposed development. Tertiary mitigation measures have described in **section 7.5** of **Chapter 7** to adequately protect this ecological feature. The reptile assemblage is therefore scoped out of the detailed assessment.	Scoped out
Breeding and wintering bird assemblage	Local/Low	The potential breeding and wintering bird assemblage identified within the site is considered to be representative of the habitats present and the populations observed on site are likely comparable to the populations within the wider area. The intensively managed arable habitat, and the breeding and wintering bird assemblage it supports, is widespread in Suffolk and the arable habitat is not being managed specifically to benefit birds. It is therefore not considered that any significant impacts would occur on this receptor as a result of the proposed development.	Scoped out

Feature/Receptor	Importance (CIEEM/ EIA Methodology)	Justification	Scope in/Out
		Breeding and wintering birds are therefore scoped out of the detailed assessment. However, breeding birds are protected under the Wildlife and Countryside Act (Ref 1.3), As such, there may be the potential for impacts on breeding birds, should works be undertaken during the breeding bird period (end of February to end of August inclusive). Details of the mitigation measures that should be employed to safeguard this ecological receptor have been detailed within **section 7.5** of **Chapter 7**.	
Bat assemblage	County/Low	At least eight bat species have been recorded within the site or the relevant ZoI during the desk-study and surveys undertaken. Activity levels were largely low, with the exception of common and soprano pipistrelle, but included the presence of the nationally rare barbastelle, a species with a restricted distribution and receiving additional protection under Annex II of the Habitats Directive (Ref 1.7). While the habitats present are largely sub-optimal, a number of trees along the site boundary and within woodland blocks immediately adjacent were identified as having the potential to support roosting bats. The degree of sensitivity bats display varies between species; however, it is recognised that all bat species can be negatively impacted by anthropogenic activities. All bat species in the UK are protected under Annex IV of the Habitats Directive (Ref 1.7), transposed to English law under the Conservation of Habitats and Species Regulations (Ref 1.11). Additional relevant legislation includes the Wildlife and Countryside Act (Ref 1.3), and the NERC Act (Ref 1.13). The bat assemblage is therefore scoped into the detailed assessment.	**IEF** **Scoped in**
Badger	Local/Low	No evidence of badgers was identified within the site; due to the distance of the nearest 'potential main' sett from the proposed works, it is not anticipated that there would be any significant effects on this receptor. Badger are therefore scoped out of the detailed assessment. Badger are protected under Schedule 6 of the Wildlife and Countryside Act (Ref 1.3) and by the Protection of Badgers Act (Ref 1.12); therefore, tertiary mitigation measures to ensure no impacts occur are described in **section 7.5** of **Chapter 7**.	Scoped out

Feature/Receptor	Importance (CIEEM/ EIA Methodology)	Justification	Scope in/Out
Brown hares	Local/Low	A population of two or three individuals were recorded on site during surveys. While a limited number of brown hare are likely to be found within or adjacent to the site, there is sufficient adjacent habitat to support this species. The number of individuals within the site boundary of this highly mobile species is unlikely to be significant for the wider population and have therefore been scoped out of the detailed assessment. The brown hare is on Suffolk's Priority Species and Habitats list (Ref 1.14) and Section 41 of the NERC Act (Ref 1.13). Details of the mitigation measures that should be employed to safeguard brown hare are detailed within **section 7.5** of **Chapter 7**.	Scoped out
Hedgehog	Local/Very Low	The habitats within the site boundary are generally unsuitable for hedgehogs and there were no records of hedgehogs during surveys. Hedgehog has therefore been scoped out of the detailed assessment. However, hedgehog is listed on Suffolk's Priority Species and Habitats list (Ref 1.14) and listed on Section 41 of the NERC Act (Ref 1.13). Details of tertiary mitigation measures that would be employed to safeguard hedgehogs are detailed in **section 7.5** of **Chapter 7**.	Scoped out

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VOLUME 4, CHAPTER 7, APPENDIX 7A: ANNEX 7A.2: DESK STUDY

Contents

Tables

Plates

None provided.

Figures

None provided.

1 Desk Study

1.1 Methodology

1.1.1. Desk study records of protected or otherwise notable species of conservation interest within 2km (unless otherwise stated) of the southern park and ride at Wickham Market site (hereafter referred to as the site) red line boundary were obtained from Suffolk Biodiversity Information Service (SBIS) in December 2014. A second data request was made in March 2016 for records of bats within 10km of the proposed development.

1.2 Plants

1.2.1. **Table 1.1** below summarises the desk study results for plants within the 2km Zone of Influence (Zol) of site.

Table 1.1: Desk study results for plants

Species	Location	Site Detail	Grid Reference	Year	Approximate distance from the site*
Frogbit (*Hydrocharis morsus-ranae*)	Parham	Parham Pond	TM3090059100	2004	1.5km north
Meadow Saffron (*Colchicum autumnale*)	Marlesford	Marlesford Estate	TM35J	1996	N/A*
Green-winged Orchid (*Orchis morio*)	Hacheston		TM31125837	2013	800m north
Field Garlic (*Allium oleraceum*)	Marlesford	R. Ore & banks between concrete bridge and old rail track	TM3258	1997	N/A*
Lesser Tussock-sedge (*Carex diandra*)	Campsey Ashe		TM35C	2012	N/A*
Dwarf Spurge (*Euphorbia exigua*)	Easton		TM25Z	1998	N/A*
	Letheringham	Hacheston	TM25Y	1998	N/A*
Black Poplar (*Populus nigra* subsp. *betulifolia*)	Campsey Ashe		TM31575589	2012	1.2km south
	River Deben (sections)	Glevering	TM29575678	2004	1.8km west
	Marlesford	Marlesford Estate	TM35J	1996	N/A*
	Marlesford	River Ore ford	TM322581	1993	470m east

Species	Location	Site Detail	Grid Reference	Year	Approximate distance from the site*
Heath Dog-violet (*Viola canina*)	Great Wood (Little Glemham)		TM35J	2004	N/A*
Wild Pansy (*Viola tricolor*)	Hacheston	Hacheston, Fairfield Green	TM3159	2005	N/A*
	Marlesford	ex rail track -TM313588	TM318584	1997	540m north
Marsh Stitchwort (*Stellaria palustris*)	Easton		TM25Z	1998	N/A*
Nottingham Catchfly (*Silene nutans*)	Campsey Ashe	Railway Station	TM326557	1993	1.7km south
Good-King-Henry (*Chenopodium bonus-henricus*)	Campsey Ashe	Railway Station	TM328559	2006	1.6km south
	Marlesford		TM316586	1997	780m north
Blue Pimpernel (*Anagallis arvensis subsp. foemina*)	Marlesford	fp -TM335581	TM329583	1997	1.1km east
Henbane (*Hyoscyamus niger*)	Hacheston	Hacheston, Fairfield Green	TM3159	2005	N/A*
Smooth Cat's-ear (*Hypochaeris glabra*)	Marlesford Churchyard		TM35J	2003	N/A*
	Easton		TM25Z	1998	N/A*
Common Cudweed (*Filago vulgaris*)	Campsey Ashe		TM35C	2012	N/A*
	Campsey Ashe		TM35I	2006	N/A*
	Marlesford	Marlesford	TM35J	2004	N/A*

Species	Location	Site Detail	Grid Reference	Year	Approximate distance from the site*
	Marlesford	Crisp's Hill from boundary to Rug's Wood beside River Ore	TM3158	1998	N/A*
	Easton		TM25Z	1998	N/A*
	Letheringham	Hacheston	TM25Y	1998	N/A*
	Marlesford	R.Ore -TM318583	TM313588	1997	1km north
	Marlesford	Ford Lane -TM324583	TM321580	1997	340m east
	Marlesford	ex rail track -TM313588	TM318584	1997	540m north-east
Corn Chamomile (*Anthemis arvensis*)	Marlesford		TM321581	1997	400m east
Stinking Chamomile (*Anthemis cotula*)	Easton		TM25Z	1998	N/A*
Corn Marigold (*Glebionis segetum*)	Hacheston	Hacheston, Fairfield Green	TM3159	2005	N/A*
Field Gromwell (*Lithospermum arvense*)	Marlesford		TM316586	1997	770m north
Hound's-tongue (*Cynoglossum officinale*)	Letheringham	Hacheston	TM25Y	1998	N/A*
	Marlesford	Ford Lane -TM324583	TM321580	1997	320m east

*Distance from the red line boundary can only be calculated where the grid reference has been received in full.

1.3 Invertebrates

1.3.1. **Table 1.2** below summarises the desk study results for invertebrates recorded within 2km ZoI of the site.

Table 1.2: Desk study results for invertebrates

Species	Location	Site Detail	Grid Reference	Year	Abundance	Approximate distance from the site*
Nebrioporus (Nebrioporus) elegans	Wickham Market	Glevering Bridge	TM295566	2009		1.8km west
Nebrioporus (Nebrioporus) elegans	Campsey Ashe	Quill Farm side channel	TM314552	2001		1.7km south
Gyrinus aeratus	Wickham Market	Glevering Bridge	TM295566	2009		1.8km west
Small heath (*Coenonympha pamphilus*)	Campsey Ashe		TM3054	2011	3 Count	N/A*
Grayling (*Hipparchia semele*)	East Suffolk		TM3256	1999	1 Count	N/A*
	Marlesford		TM324579	1995		520m east
	Marlesford		TM322586	1995		890m east
	Wickham Market		TM326558	1995		1.6km south
	East Suffolk		TM3258	1995	1 Count	N/A*
	Campsey Ashe		TM333562	1995		1.8km south-east
Wall (*Lasiommata megera*)	Campsey Ashe		TM3155	2009	2 Count	N/A*
	East Suffolk		TM3054	2000	1 Count	N/A*
	East Suffolk		TM3256	1998	1 Count	N/A*

Species	Location	Site Detail	Grid Reference	Year	Abundance	Approximate distance from the site*
	East Suffolk		TM3058	1995	1 Count	N/A*
White admiral (*Limenitis camilla*)	East Suffolk		TM3256	1998	1 Count	N/A*
	Campsey Ashe		TM332562	1997	1 Count of present	1.7km south-east
Swallowtail (*Papilio machaon*)	Marlesford		TM3258	2006	1 Count	N/A*
	Campsey Ashe		TM3356	1996	1 Count	N/A*
	Campsey Ashe		TM332562	1996		1.7km south-east

* Insufficient information provided in grid reference to enable the specific location of this record within the 2km ZoI to be determined.

1.4 Amphibians

1.4.1. **Table 1.3** below summarises the desk study results for amphibians recorded within 2km ZoI of the site.

Table 1.3: Desk study results for amphibians

Species	Location	Site Detail	Grid Reference	Year	Abundance	Approximate distance from the site*
Common toad (*Bufo bufo*)	Campsey Ashe		TM323555	2010	-	1.7km south
	Hacheston	Glevering, Easton Road B1116, Hacheston	TM299567	2008	-	1.4km west
	Hacheston	Tank Road, Nr Glevering Hall & River	TM295576	2010	-	1.9km north-west
	Marlesford	Marlesford Hall Reservoir	TM325591	2003	-	1.4km north-east
	Wickham Market		TM307558	2000	28 Count of dead; 70 Count of adult	1.3km south-west
	Wickham Market	Fowls Watering	TM309553	1999	1 Count of adult; 1 Count of dead	1.7km south-west
Great crested newt (*Triturus cristatus*)	Marlesford	Marlesford	TM32725962	2008	-	1.9km north-east
	Parham		TM311598	2011	-	2km north
	Marlesford		TM327594	2010	-	1.8km north
	Marlesford		TM327593	2010	-	2km north
	Marlesford		TM3305058969	2010	-	2km north-east
	Marlesford		TM319595	2010	-	1.6km north
	Marlesford		TM324594	2010	-	1.6km north

1.5 Reptiles

1.5.1. **Table 1.4** below summarises the desk study results for reptiles recorded within 2km ZoI of the site.

Table 1.4: Desk study results for reptiles

Species	Location	Site Detail	Grid Reference	Year	Abundance	Approximate distance from the site*
Slow-worm (*Anguis fragilis*)	Campsey Ashe		TM323555	2010	-	1.9km south
	Campsey Ashe	Abandoned sidings	TM326558	2005	-	1.8km south
Grass snake (*Natrix helvetica helvetica*)	Hacheston	Hacheston, Avocet House	TM308593	2007	-	1.5km north
	Campsey Ashe	Abandoned sidings	TM326558	2005	-	1.8km south
	Campsey Ashe		TM323555	2010	-	1.9km south
	Wickham Market	Wickham Market - Outside entrance to Glevering Hall	TM297572	2005	-	1.5km west
	Hacheston	Hacheston, Garden	TM308594	2006	-	1.4km north
Common lizard (*Zootoca vivipara*)	Campsey Ashe		TM323555	2010	-	1.9km south
	Campsey Ashe	Abandoned sidings	TM326558	2005	-	1.8km south
Adder (*Vipera berus*)	Marlesford	Near old railway track, Marlesford	TM321583	2003	-	600m north

1.6 Birds

1.6.1. **Table 1.5** below summarises the desk study results for birds within the 2km ZoI of the site.

Table 1.5: Desk study results for birds

Species	Location	Site Detail	Grid Reference	Year	Abundance	Approximate distance from the site*
Greylag goose (*Anser anser*)	Parham		TM3160	2010	1 Count	N/A*
Shelduck (*Tadorna tadorna*)	Campsey Ashe		TM3355	2010	2 Count	N/A*
Swift (*Apus apus*)	Hacheston		TM3158	2011	2 Count	N/A*
	Wickham Market	High Street, Wickham Market, IP13 0RF	TM304564	2010		1km west
Lapwing (*Vanellus vanellus*)	Parham		TM3160	2011	4 Count	N/A*
Herring gull (*Larus argentatus*)	Hacheston		TM3158	2011	1 Count	N/A*
	Parham		TM3160	2011	1 Count	N/A*
Green sandpiper (*Tringa ochropus*)	Wickham Market		TM305566	2008	1 Count	900m west
Little egret (*Egretta garzetta*)	Hacheston		TM3158	2011	3 Count	N/A*
	Wickham Market	River Deben, Wickham Market	TM306565	2007	1 Count	850m west
Turtle dove (*Streptopelia turtur*)	Hacheston		TM3158	2011	1 Count	N/A*
	Campsey Ashe		TM3155	2011	1 Count	N/A*
	Hacheston		TM3059	2001		N/A*

Species	Location	Site Detail	Grid Reference	Year	Abundance	Approximate distance from the site*
Kingfisher (*Alcedo atthis*)	Marlesford		TM3358	2010	1 Count	N/A*
	Wickham Market	River Deben	TM3056	1993	1 Count of present	N/A*
Cuckoo (*Cuculus canorus*)	Hacheston		TM3158	2011	1 Count	N/A*
	Hacheston		TM3059	1993	1 Count of present	N/A*
Hen harrier (*Circus cyaneus*)	Little Glemham		TM336583	1994	1 Count of male	1.7km east
Osprey (*Pandion haliaetus*)	Marlesford	A12	TM3258	1994	1 Count of Flying North	N/A*
Honey-buzzard (*Pernis apivorus*)	Wickham Market		TM3055	2008		N/A*
Hobby (*Falco Subbuteo*)	Campsey Ashe		TM3155	2011	1 Count	N/A*
	Wickham Market		TM296575	1997		1.9km north-west
Kestrel (*Falco tinunculus*)	Marlesford		TM3358	2011	1 Count	N/A*
	Hacheston		TM3158	2011	1 Count	N/A*
	Campsey Ashe		TM3155	2011	1 Count	N/A*
	Parham		TM3160	2011	1 Count	N/A*
	Wickham Market		TM296576	1997		1.9km north-west
	Hacheston	Whin Belt	TM315574	1995		1.9km south-west
	Little Glemham	Moat farm, Lt. Glemham	TM334585	1995		1.7km east
	Wickham Market	Gleveling Park	TM304574	1995		1.1km north-west

Species	Location	Site Detail	Grid Reference	Year	Abundance	Approximate distance from the site*
	Hacheston	Easton Road	TM305572	1995		1km west
	Hacheston		TM312568	1993	1 Count of present	210m west
Grey partridge (*Perdix perdix*)	Little Glemham		TM333586	1994	5 Count of adult	1.6km east
Skylark (*Alauda arvensis*)	Parham		TM3160	2011	15 Count	N/A*
	Campsey Ashe		TM3155	2011	1 Count	N/A*
	Campsey Ashe		TM3355	2010	6 Count	N/A*
	Hacheston		TM3158	2011	4 Count	N/A*
	Marlesford		TM3358	2011	1 Count	N/A*
	Marlesford		TM3258	2001	23 Count	N/A*
Eurasian treecreeper (*Certhia familiaris*)	Marlesford		TM3358	2010	1 Count	N/A*
	Parham		TM3160	2010	1 Count	N/A*
Yellowhammer (*Emberiza citronella*)	Marlesford		TM3358	2011	9 Count	N/A*
	Parham		TM3160	2011	1 Count	N/A*
	Hacheston		TM3158	2011	1 Count	N/A*
Reed bunting (*Emberiza schoeniclus*)	Hacheston		TM3158	2010	2 Count	N/A*
Linnet (*Carduelis cannabina*)	Hacheston		TM3158	2011	2 Count	N/A*
	Marlesford		TM3358	2011	2 Count	N/A*
	Parham		TM3160	2011	3 Count	N/A*

Species	Location	Site Detail	Grid Reference	Year	Abundance	Approximate distance from the site*
	Campsey Ashe		TM3355	2010	2 Count	N/A*
European goldfinch (*Carduelis carduelis*)	Parham		TM3160	2011	1 Count	N/A*
	Hacheston		TM3158	2011	10 Count	N/A*
	Wickham Market	High Street, Wickham Market, IP13 0RF	TM304564	2010		1km west
	Campsey Ashe		TM3355	2010	2 Count	N/A*
	Marlesford		TM3358	2010	2 Count	N/A*
	Wickham Market	Wickham Bridge - Wickham Market	TM3056	2011	1 Count	N/A*
	Wickham Market	High Street, Wickham Market, IP13 0RF	TM304564	2010		1km west
	Campsey Ashe		TM3355	2010	5 Count	N/A*
	Hacheston		TM3158	2011	3 Count	N/A*
	Parham		TM3160	2011	2 Count	N/A*
	Marlesford		TM3358	2011	3 Count	N/A*
Common redpoll (*Carduelis flammea*)	Campsey Ashe	Loudham	TM315550	2009	12 Count	2km south-west
Eurasian siskin (*Carduelis spinus*)	Parham		TM3160	2010	2 Count	N/A*
	Marlesford		TM3358	2010	4 Count	N/A*
	Hacheston		TM3158	2010	2 Count	N/A*

Species	Location	Site Detail	Grid Reference	Year	Abundance	Approximate distance from the site*
Brambling (*Fringilla montifringilla*)	Marlesford		TM3358	2011	132 Count	N/A*
	Parham		TM3160	2011	2 Count	N/A*
	Hacheston		TM3158	2011	1 Count	N/A*
	Little Glemham		TM337584	1994	1 Count of female	1.9km east
Bullfinch (*Pyrrhula pyrrhula*)	Parham		TM3160	2011	1 Count	N/A*
	Marlesford		TM3358	2011	2 Count	N/A*
	Hacheston		TM3158	2010	2 Count	N/A*
House martin (*Delichon urbica*)	Parham		TM3160	2011	4 Count	N/A*
	Hacheston		TM3158	2011	6 Count	N/A*
	Marlesford		TM3358	2010	8 Count	N/A*
Barn swallow (*Hirundo rustica*)	Marlesford		TM3358	2010	4 Count	N/A*
	Hacheston		TM3158	2010	3 Count	N/A*
	Campsey Ashe		TM3355	2010	2 Count	N/A*
	Parham		TM3160	2010	2 Count	N/A*
	Campsey Ashe		TM3155	2011	1 Count	N/A*
Sand martin (*Riparia riparia*)	Marlesford	Sandpit beside A12	TM3258	1993		N/A*
Great grey shrike (*Lanius excubitor*)	Marlesford		TM3358	2011	1 Count	N/A*
Meadow pipit (*Anthus pratensis*)	Marlesford		TM3358	2011	6 Count	N/A*

Species	Location	Site Detail	Grid Reference	Year	Abundance	Approximate distance from the site*
	Hacheston		TM3158	2010	1 Count	N/A*
Pied wagtail (*Motacilla alba*)	Marlesford		TM3358	2011	2 Count	N/A*
	Hacheston		TM3158	2011	1 Count	N/A*
Grey wagtail (*Motacilla cinerea*)	Wickham Market		TM3056	1995		N/A*
Spotted flycatcher (*Muscicapa striata*)	Wickham Market		TM302555	2007	2 Count of Pair	1.8km south-west
	Wickham Market		TM3056	2008	2 Count	N/A*
	Campsey Ashe	Loudham	TM315550	2010	1 Count	1.9km south
	Campsey Ashe		TM3355	2010	1 Count	N/A*
	Wickham Market		TM304563	2007	2 Count	1.1km west
	Hacheston		TM3158	2007	2 Count	N/A*
	Marlesford		TM3359	2007	2 Count	N/A*
	Campsey Ashe		TM3356	2000	2 Count	N/A*
Blue tit (*Cyanistes caeruleus*)	Wickham Market	Wickham Bridge	TM3056	2011	1 Count	N/A*
	Campsey Ashe		TM3155	2011	1 Count	N/A*
	Hacheston		TM3158	2011	2 Count	N/A*
	Parham		TM3160	2011	4 Count	N/A*
	Marlesford		TM3358	2011	1 Count	N/A*
	Wickham Market	High Street, Wickham Market, IP13 0RF	TM304564	2010		1km south-west

Species	Location	Site Detail	Grid Reference	Year	Abundance	Approximate distance from the site*
	Campsey Ashe		TM3355	2010	2 Count	N/A*
Great tit (*Parus major*)	Campsey Ashe		TM3155	2011	1 Count	N/A*
	Marlesford		TM3358	2011	1 Count	N/A*
	Hacheston		TM3158	2011	2 Count	N/A*
	Parham		TM3160	2011	1 Count	N/A*
	Campsey Ashe		TM3355	2010	5 Count	N/A*
	Campsey Ashe		TM323555	2010		1.7km south
	Wickham Market	High Street, Wickham Market, IP13 0RF	TM304564	2010		1km south-west
Coal tit (*Periparus ater*)	Hacheston		TM3158	2011	1 Count	N/A*
	Marlesford		TM3358	2011	2 Count	N/A*
	Parham		TM3160	2011	1 Count	N/A*
Marsh tit (*Poecile palustris*)	Campsey Ashe		TM3356	2008	3 Count	N/A*
	Parham		TM3160	2011	2 Count	N/A*
	Campsey Ashe	Loudham	TM315550	2010	1 Count	1.9km south
House sparrow (*Passer domesticus*)	Parham		TM3160	2011	4 Count	N/A*
	Hacheston		TM3158	2011	3 Count	N/A*
	Marlesford		TM3358	2011	2 Count	N/A*
	Campsey Ashe		TM323555	2010		1.7km south

Species	Location	Site Detail	Grid Reference	Year	Abundance	Approximate distance from the site*
	Campsey Ashe		TM3355	2010	2 Count	N/A*
Hedge accentor (*Prunella modularis*)	Marlesford		TM3358	2011	1 Count	N/A*
	Hacheston		TM3158	2011	1 Count	N/A*
	Parham		TM3160	2011	1 Count	N/A*
	Campsey Ashe		TM3355	2010	2 Count	N/A*
	Campsey Ashe		TM323555	2010		1.7km south
Goldcrest (*Regulus regulus*)	Hacheston		TM3158	2010	1 Count	N/A*
	Marlesford		TM3358	2011	1 Count	N/A*
Robin (*Erithacus rubecula*)	Campsey Ashe		TM3355	2010	2 Count	N/A*
	Campsey Ashe		TM323555	2010		1.7km south
	Campsey Ashe		TM3155	2011	1 Count	N/A*
	Marlesford		TM3358	2011	6 Count	N/A*
	Parham		TM3160	2011	2 Count	N/A*
	Hacheston		TM3158	2011	6 Count	N/A*
Common nightingale (*Luscinia megarhynchos*)	Hacheston		TM3158	2010	1 Count	N/A*
	Campsey Ashe		TM3355	2010	2 Count	N/A*
	Hacheston		TM3059	1993	1 Count of present	N/A*
Black redstart (*Phoenicurus ochruros*)	Wickham Market		TM3055	2008		N/A*

Species	Location	Site Detail	Grid Reference	Year	Abundance	Approximate distance from the site*
Starling (*Sturnus vulgaris*)	Hacheston		TM3158	2011	14 Count	N/A*
	Parham		TM3160	2011	24 Count	N/A*
	Marlesford		TM3358	2011	53 Count	N/A*
	Campsey Ashe		TM323555	2010		1.7km south
Grasshopper warbler (*Locustella naevia*)	Wickham Market	River Deben	TM3056	1993	1 Count of present	N/A*
Winter wren (*Troglodytes hiemalis*)	Parham		TM3160	2011	1 Count	N/A*
	Campsey Ashe		TM3155	2011	1 Count	N/A*
	Hacheston		TM3158	2011	1 Count	N/A*
	Marlesford		TM3358	2011	2 Count	N/A*
	Campsey Ashe		TM3355	2010	3 Count	N/A*
Redwing (*Turdus iliacus*)	Wickham Market	A12 by-pass	TM3056	1993	30 Count of Flying North	N/A*
	Hacheston		TM3158	2011	9 Count	N/A*
	Parham		TM3160	2010	1 Count	N/A*
	Marlesford		TM3358	2010	1 Count	N/A*
Song thrush (*Turdus Philomena*)	Parham		TM3160	2011	1 Count	N/A*
	Marlesford		TM3358	2010	1 Count	N/A*
	Hacheston		TM3158	2010	3 Count	N/A*
	Hacheston		TM3059	2001	2 Count	N/A*

Species	Location	Site Detail	Grid Reference	Year	Abundance	Approximate distance from the site*
Fieldfare (*Turdus pilaris*)	Marlesford		TM3358	2011	12 Count	N/A*
	Hacheston		TM3158	2011	42 Count	N/A*
	Parham		TM3160	2011	1 Count	N/A*
	Marlesford	A12	TM3258	1993	20 Count of present	N/A*
Great spotted woodpecker (*Dendrocopos major*)	Hacheston		TM3158	2011	1 Count	N/A*
	Parham		TM3160	2011	1 Count	N/A*
	Marlesford		TM3358	2010	1 Count	N/A*
	Campsey Ashe	Loudham	TM315550	2010	2 Count	1.9km south
Lesser spotted woodpecker (*Dendrocopos minor*)	Little Glemham		TM333586	1994	1 Count of male	1.6km east
Green woodpecker (*Picus viridis*)	Campsey Ashe		TM3155	2011	1 Count	N/A*
	Hacheston		TM3158	2011	1 Count	N/A*
	Marlesford		TM3358	2011	1 Count	N/A*
	Parham		TM3160	2011	3 Count	N/A*
Little owl (*Athene noctua*)	Hacheston		TM3158	2010	1 Count	N/A*
	Little Glemham	Moat Farm, Lt. Glemham	TM337585	1995		1.9km east
	Hacheston		TM3059	1993	1 Count of present	N/A*

Species	Location	Site Detail	Grid Reference	Year	Abundance	Approximate distance from the site*
	Wickham Market	Fowl's Watering	TM3056	1993	1 Count of present	N/A*
	Little Glemham		TM337584	1994		1.9km east
	Campsey Ashe		TM3356	1994	2 Count of adult	N/A*
Tawny owl (*Strix aluco*)	Marlesford		TM3358	2011	1 Count	N/A*
	Hacheston		TM3158	2010	2 Count	N/A*
	Little Glemham	Moat Farm, Lt. Glemham	TM322587	1995		940m north-east
	Campsey Ashe		TM3356	2008	2 Count	N/A*
	Wickham Market	Gleversing Hall	TM296568	1997		1.7km west
	East Suffolk	Great Wood	TM299579	1997		1.6km north-west
	Hacheston		TM3059	1997		N/A*
	East Suffolk		TM35C	1995		N/A*
	Hacheston	Coltfoot Wood	TM308576	1995		700m north-west
	Wickham Market	A12	TM3056	1993	1 Count of dead	N/A*
Barn owl (*Tyto alba*)	Hacheston		TM3158	2011	1 Count	N/A*
	Campsey Ashe		TM323555	2010		1.7km south
	Parham		TM3160	2010	4 Count	N/A*
	Marlesford		TM3358	2010	1 Count	N/A*
	Campsey Ashe		TM3355	2010	1 Count	N/A*

Species	Location	Site Detail	Grid Reference	Year	Abundance	Approximate distance from the site*
	Campsey Ashe	Chantry Farm, Campsey Ashe	TM327555	1996		1.9km south
	Hacheston		TM3059	2000	1 Count	N/A*
	Wickham Market		TM3056	1997		N/A*
	East Suffolk		TM317556	1995		1.4km south
	Marlesford	Lime Tree Barn	TM324579	1995		500m east
	Marlesford		TM3258	1995		N/A*
	East Suffolk		TM35C	1995		N/A*

* Insufficient information provided in grid reference to enable the specific location of this record within the 2km ZoI to be determined.

1.7 Bats

1.7.1. **Table 1.6** below summarises the desk study results for bats.

1.7.2. As detailed in Section 4 of Appendix 7A the ZoI for individual bat species has been identified based on the recommended Core Sustenance Zones (CSZ) identified by the Bat Conservation Trust (BCT)1. The sole exception to this is for barbastelle (*Barbastella barbastellus*) for which the ZoI has been extended to 10km based on radio-tracking information gathered across the EDF Energy estate as part of survey work relating to the Sizewell C Project.

Table 1.6: Desk study results for bats

Species (ZoI (km))	Location	Site Detail	Grid Reference	Year	Abundance	Record Details	Approximate distance from the site*
Barbastelle (10km)	Great Glemham		TM35236172	2013		Bat detector	5.1km north-east
	Great Glemham		TM35306191	2013		Bat detector	5.3km north-east
	Great Glemham		TM34346187	2013		Bat detector	4.6km north-east
	Great Glemham		TM35206152	2013		Bat detector	5km north-east
	Great Glemham		TM34456203	2013		Bat detector	4.9km north-east
	Little Glemham Churchyard		TM3466258734	2013			2.8km east
	Great Glemham		TM34776185	2013		Bat detector	4.8km north-east
	Great Glemham		TM34576164	2013		Bat detector	4.6km north-east

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

Species (ZoI (km))	Location	Site Detail	Grid Reference	Year	Abundance	Record Details	Approximate distance from the site*
	Otley	Hall Road, Otley	TM2156	2012		Dead found on road	N/A*
	Monewden	Monewden Hall Farm Barns	TM245595	2012			7.2km north-west
	Little Glemham	Sink Farm Little Glemham	TM354583	2011	5 Count	Bat detector record	3.5km east
	Campsey Ashe		TM323555	2010			1.7km south
	Letheringham	Office Farm barn, Letheringham	TM273576	2005	1 Count of hibernating	English Nature survey	4.2km north-west
	Staverton Park and The Thicks		TM360505	2001			7.9km south
Brown long-eared bat (*Plecotus auritus*) (3km)	Wickham Market	Coach House, 184 High St, Wickham Market	TM3035056340	2014		Feeding roost - very few droppings	1.2km west
	Hacheston Churchyard	All Saints Church Hacheston	TM31255850	2013		Breeding colony	860m north
	Campsey Ashe		TM331562	2009		Roost	1.6km south
	Campsey Ashe Churchyard	St John the Baptist Church Campsea Ashe	TM330559	2009		Breeding colony	1.7km south
	Marlesford Churchyard	St Andrews Church Marlesford	TM324584	2008		Breeding colony	850m east

Species (ZoI (km))	Location	Site Detail	Grid Reference	Year	Abundance	Record Details	Approximate distance from the site*
	Marlesford		TM323582	2008		Roost	620m east
	Easton		TM287584	2014			2.9km north-west
	Little Glemham Churchyard		TM3466258734	2013			2.8km east
	Campsey Ashe		TM323555	2010			1.7km south
	Parham		TM315605	1996		Listed barn survey	2.6km north
	Marlesford Churchyard		TM323583	1996			680m east
	Campsea Ashe Ice House	H13 Garden Cottage Ice house, Campsey Ashe	TM338551	2001			2.9km south
	Campsey Ashe	Upper Barn, Loudham	TM3154	2007		Breeding Colony	N/A*
	Pettistree	Pettistree Lodge, Pettistree	TM296549	2002			2.7km south-west
Common pipistrelle (*Pipistrellus pipistrellus*) (2km)	Campsey Ashe		TM323555	2010			1.7km south
	Wickham Market	Glevering Mill, Wickham Market	TM296567	2002			1.7km west
Myotis spp. (4km)	Great Glemham		TM35206152	2013		Bat detector	5km north-east
	Great Glemham		TM35236172	2013		Bat detector	5.1km north-east
	Great Glemham		TM35306191	2013		Bat detector	5.3km north-east

Species (ZoI (km))	Location	Site Detail	Grid Reference	Year	Abundance	Record Details	Approximate distance from the site*
	Great Glemham		TM34186169	2013		Bat detector	4.4km north-east
	Great Glemham		TM34346187	2013		Bat detector	4.6km north-east
	Great Glemham		TM34776185	2013		Bat detector	4.8km north-east
Nathusius' pipistrelle (*Pipistrellus nathusii*) (3km)	Campsey Ashe		TM323555	2010			1.7km south
Natterer's bat (*Myotis nattereri*) (4km)	Parham	Moat Farm, Parham	TM314594	2010		Hibernating	1.5km north
	Parham	High House, Parham, Suffolk	TM294609	2004		Roost	3.8km north
	Parham Churchyard	St Mary the Virgin, Parham, Woodbridge, IP13 9AA	TM309606	2004	50 Count	Breeding roost	2.9km north
	Blaxhall		TM355575	2014	1 Count	Killed by cat, breeding female	3.5km south-east
	Campsea Ashe Ice House		TM338553	2006	3 Count		2.8km south
	Campsea Ashe Ice House	H13 Garden Cottage Ice house, Campsey Ashe	TM338551	2001			2.9km south
	Little Glemham	Sink Farm, Little Glemham	TM353583	1996			3.4km south-east

Species (ZoI (km))	Location	Site Detail	Grid Reference	Year	Abundance	Record Details	Approximate distance from the site*
Noctule (*Nyctalus noctula*) (4km)	Campsey Ashe		TM323555	2010			1.7km south
	Campsea Ashe Park		TM339554	1996	1 Count of in flight		2.8km south-east
Pipistrellus spp.	Hacheston Churchyard	All Saints Church Hacheston	TM31255850	2013		Breeding colony	880m north
	Campsey Ashe		TM331562	2009		Roost	1.6km south-east
	Campsey Ashe Churchyard	St John the Baptist Church Campsey Ashe	TM330559	2009		Breeding colony	1.7km south
Serotine (*Eptesicus serotinus*) (4km)	Campsey Ashe		TM331562	2009	1 Count	Roost	1.6km south-east
	Marlesford		TM323582	2008		Roost	620m east
	Campsey Ashe		TM323555	2010			1.7km south
	Letheringham	Letheringham Hall Barn	TM280580	1996			3.5km north-west
	Easton Churchyard		TM283588	1996			3.4km north-west
	Campsea Ashe Park		TM339554	1996			2.8km south-east
	Easton Churchyard		TM284588	1996			3.3km north-west
	Letheringham		TM276570	1996			3.7km north-west
	Marlesford Churchyard	St Andrew	TM3232958311	2013		DNA analysis of bat dropping	700m north-east

Species (ZoI (km))	Location	Site Detail	Grid Reference	Year	Abundance	Record Details	Approximate distance from the site*
Soprano pipistrelle (*Pipistrellus pygmaeus*) (3km)						collected from inside the church	
	Hacheston	1, Glevering Hall Cottages, Hacheston	TM299568	2006	80+ Count	375 counted in June 06 Breeding colony	1.4km west
	Easton		TM287584	2014			2.9km north-west
	Little Glemham Churchyard		TM3466258734	2013			2.8km east
	Campsey Ashe		TM323555	2010			1.7km south
	Marlesford Churchyard		TM324584	2003			830m north-east

* Insufficient information provided in grid reference to enable the specific location of this record within the 2km ZoI to be determined

1.8 Terrestrial mammals

1.8.1. **Table 1.7** below summarises the desk study results for terrestrial mammals recorded within 2km ZoI of the site.

Table 1.7: Desk study results for terrestrial mammals

Species	Location	Site Detail	Grid Reference	Year	Abundance	Approximate distance from the site*
European otter (*Lutra lutra*)	Wickham Market		TM306565	2012	1 Count of dead	800m south-west
	Hacheston	Alde - Ore	TM3095859214	2008		1.8km north-west
	Wickham Market	Deben	TM295565	2008		1.9km west
	Marlesford	Alde - Ore	TM327577	2008		800m east
	Campsey Ashe	Deben	TM3153055530	2008		1.4km south
	Marlesford	Ore Limetree Fm Marlesford	TM3187158381	2007		600m north
	Hacheston	Ore Moat Fm Hacheston	TM3089059340	2007		1.8km north-west
	Blaxhall	Ore Redhse Fm Blaxhall	TM3380857302	2007		1.9km south-east
	Campsey Ashe	Low Farm, Campsea Ashe	TM31515525	2004		1.7km south
	Marlesford	River Ore, Marlesford	TM323580	2004		500m east
	Marlesford	River Ore, Marlesford	TM32715773	2004		800m east
	Wickham Market	River Deben, Wickham Market	TM30985553	2004		1.3km south
	Wickham Market	Wickham Mkt A12 Bridge	TM309558	2004		1.2km south
	Wickham Market		TM295566	2000		1.9km west

Species	Location	Site Detail	Grid Reference	Year	Abundance	Approximate distance from the site*
	Wickham Market	Deben, Glevering Mill House on the River Deben	TM296566	2000		1.9km west
	Deben Mill House	Mill pool	TM306566	1996		800m south-west
	Campsey Ashe	Deben	TM330561	1993		1.9km south-east
Eurasian badger (*Meles meles*)	Campsey Ashe	Blackstock Wood	TM3385056967	2013		2.0km south-east
	Hacheston		TM30875762	2004	1 Count of Burrow	400m west
	Hacheston		TM30775738	2004	1 Count of Burrow	280m west
	Hacheston		TM30955742	2004	1 Count of Burrow	180m west
	Hacheston		TM30875742	2004	1 Count of Burrow	220m west
	Campsey Ashe	Wood	TM33855698	2002		1.9km east
Western European hedgehog (*Erinaceus europaeus*)	Wickham Market		TM308566	1996	1 Count of dead	490m south-west
	Easton		TM297572	1996	1 Count of dead	1.3km west
	Hacheston		TM2958	1995		N/A*
	Wickham Market		TM302563	1994		1.1km south-west
	Wickham Market		TM298565	1993		1.4km south-west
Brown hare (*Lepus europaeus*)	Campsey Ashe		TM327563	2010	2 Count	1.2km to the south-east
	Marlesford		TM3257	2008		N/A*

Species	Location	Site Detail	Grid Reference	Year	Abundance	Approximate distance from the site*
	Wickham Market		TM3256	2004		N/A*
	Wickham Market	Near Valley Farm	TM293563	1996	1 Count of dead	2.0km south-west
	Marlesford		TM322584	1996		730m north-east
Water vole (*Arvicola amphibius*)	Wickham Market	Glevering Hall Farm, Wickham Market.	TM30035655	2004		1.1km west
	Wickham Market		TM308566	2000		470m west
	Hacheston		TM30885935	1997		1.7km north-west
	Wickham Market		TM31515525	1997		1.5km south
	Letheringham	Glevering House Letheringham	TM29435724	1997		1.6km west
	Marlesford	River Ore	TM323581	1997		600m north-east
	Marlesford	River Ore	TM328578	1996		900m east
	Hacheston	River Ore	TM309592	1996		1.6km north-west
	Wickham Market		TM3155	1993		N/A*

* Insufficient information provided in grid reference to enable the specific location of this record within the 2km ZoI to be determined

VOLUME 4, CHAPTER 7, APPENDIX 7A: ANNEX 7A.2: DESK-STUDY, ANNEX 7A.2A DESIGNATED SITES CITATIONS

County Wildlife Site Citations

County Wildlife Site Citations

CWS Number	Suffolk Coastal 26
Site Name	RIVER DEBEN(Sections)
Parish	WICKHAM MARKET
District	Suffolk Coastal
NGR	TM246600
Description	Water quality is particularly good in these stretches of the River Deben and fish, dragonflies and damselflies are present in large numbers. A wide range of both aquatic and emergent species have been recorded, including unusual riverine plants for example river water-dropwort (a scarce plant in the region), white water lily, flowering rush and mare's-tail. A wide poached shelf along some sections of the river bank supports many marshland plants including gypsywort, lesser water parsnip and purple loosestrife.
RNR Number	0
Area	1.74

County Wildlife Site Citations

CWS Number	Suffolk Coastal 40
Site Name	THE OAKS
Parish	CAMPSEY ASH
District	Suffolk Coastal
NGR	TM318553
Description	This ancient woodland sits on the side of the Deben valley and is linked to grazing marshes; it has a wide range of ground flora reflecting the varied soils of the valley side with a gradient from wet to dry. In the boggier areas, rushes and yellow iris are found with alder as the dominant tree species. In drier parts the flora includes ancient woodland indicators such as orpine, bluebells and remote sedge. The canopy includes native and introduced broadleaves and there is a very varied understorey including hawthorn, elder, hazel, spindle, crab apple, and some field maple coppice. There is a good ditch and bank with an old mixed hedge running along the western boundary and the southern margin contains some very old oak coppice. There are no rides but there is a footpath and several open grassy clearings.
RNR Number	0
Area	5.02

County Wildlife Site Citations

CWS Number	Suffolk Coastal 39
Site Name	DECOY POND, ASHE ABBEY
Parish	CAMPSEY ASH
District	Suffolk Coastal
NGR	TM317546
Description	The woodland surrounds a large, originally man-made lake fed by the River Deben. To the north is a larch and conifer woodland. The remaining woodland consists of alder and hazel coppice, oak, beech, horse-chestnut, ash, willow, Turkey oak and rhododendron. The ground flora is varied with patches of rank fen vegetation including reed and hairy willowherb. This is interspersed with a more interesting flora which includes hemp agrimony, yellow iris and angelica. Bracken dominates the drier areas in the wood. The lake supports a good population of both yellow and white water lily. The latter species is an indicator of unpolluted water. A kingfisher was observed on a number of occasions on the edge of the lake.
RNR Number	0
Area	7.27

County Wildlife Site Citations

CWS Number	Suffolk Coastal 81
Site Name	GREAT WOOD, GLEVERING HALL
Parish	HACHESTON
District	Suffolk Coastal
NGR	TM299581
Description	This is a large ancient woodland with mixed broadleaved trees and a large herb-rich glade cleared sometime around 1900. As with many Suffolk ancient woods, a few softwood trees such as larch have been planted but this has not greatly affected the wood. The woodland structure is one of neglected hazel, field maple and hornbeam coppice with sparse ash standards. Oak, birch, willows and a variety of other tree and shrub species are present, including the rare wild service tree on the southern edge of the wood. There are stretches of remnant ditch and bank around the perimeter with a hawthorn/blackthorn hedge. The ground flora is extremely diverse with 103 species recorded including moschatel, common spotted orchid, hairy St John's-wort, twayblade and adder's-tongue fern. Additional habitat is provided by a number of ponds and a good deal of fallen dead wood.
RNR Number	0
Area	24.25

County Wildlife Site Citations

CWS Number	Suffolk Coastal 82
Site Name	CATTS WOOD
Parish	HACHESTON
District	Suffolk Coastal
NGR	TM305576
Description	Catt's Wood is a good example of an ancient Suffolk wood of coppice with standards. The canopy trees are oak, ash, and Corsican pine while the coppiced species include ash, field maple, hazel and horse chestnut. The shrub layer also includes elm, elder, dog-rose, redcurrant and spindle (which has an affinity for ancient woodlands). The ground flora is well distributed and varied, especially on the open well managed rides. It too, reflects the ancient nature of the wood with a number of ancient woodland indicator plants, for example, remote sedge and primrose. There are both internal and boundary earthworks, the latter marking the perimeter with a ditch and bank system where there is also an old mixed hedge. Additional habitat is provided by a pond.
RNR Number	0
Area	9.32

County Wildlife Site Citations

CWS Number	Suffolk Coastal 83
Site Name	LOWER HACHESTON MEADOW
Parish	HACHESTON
District	Suffolk Coastal
NGR	TM318567
Description	One of the improved pastures which is situated adjacent to the Campsey Ash/Wickham Market road contains a remnant, species diverse wetland habitat which has not been affected by agricultural chemicals. This corner of the meadow, which is only 0.1 hectare in area, supports a good population of plants which are becoming increasingly rare in Suffolk for example ragged robin, marsh marigold and square-stalked St John's-wort.
RNR Number	0
Area	0.61

County Wildlife Site Citations

CWS Number	Suffolk Coastal 41
Site Name	COPPERAS WOOD
Parish	CAMPSEY ASH
District	Suffolk Coastal
NGR	TM325547
Description	Copperas Wood can be divided into two parts, to the south-west and to the north-east, separated by an area of unimproved meadow. The south-west portion was a pine/sweet chestnut plantation which has recently been felled to be replaced by pure hardwoods. However its ancient history is indicated by a broad ditch and bank running around the perimeter. Old hazel and field maple coppice with oak and ash standards survives in some parts, and ground flora here includes bluebell and primrose. The north-east part of the wood has a double ditch and bank boundary and complex internal earthworks. Here there is hazel and ash coppice with oak standards. There are also some very old horse chestnut coppice stools. Elm, holly, field maple, redcurrant and elder appear in the understorey. The ground flora in this part of the wood includes primrose and remote sedge. The structure of both parts of the wood is very interesting but the north-east section is of great antiquity and therefore of high nature conservation value.
RNR Number	0
Area	11.36

VOLUME 4 CHAPTER 7, APPENDIX 7A:

ANNEX 7A.3: SECONDARY DATA

GREAT CRESTED NEWT SURVEY 2012

NNB Generation Company

Sizewell Associated Development Sites

Great Crested Newt Survey Report

April 2012

AMEC Environment & Infrastructure UK Limited

NNB Generation Company

Sizewell Associated Development Sites

Great Crested Newt Survey Report

April 2012

AMEC Environment & Infrastructure UK Limited

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Certificate No. FS 13881 Certificate No. EMS 69090

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This report has been prepared in a working draft form and has not been finalised or formally reviewed. As such it should be taken as an indication only of the material and conclusions that will form the final report. Any calculations or findings presented here may be changed or altered and should not be taken to reflect AMEC's opinions or conclusions.

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Document Revisions

No.	Details	Date
1	Draft	April 2012

Contents

1. Introduction

1.1 Background

An area of land directly north of Sizewell B Nuclear Power Station, which is located near Leiston in Suffolk, has been identified as having the potential to accommodate the proposed development of one or more new nuclear reactors. This proposed development is known as Sizewell C. The site of the proposed development has an approximate central National Grid Reference (NGR) of TM473640. NNB Generation Company (EDF) has identified a number of additional sites for a variety of developments associated with the new build proposals at Sizewell that will be located beyond the current EDF landholding. AMEC Environment & Infrastructure UK Ltd ('AMEC') has been commissioned to provide ecological services in relation to these sites, in order to inform the site selection process and support any future planning submissions.

1.2 Purpose of this Report

The focus of the survey work was to establish presence/likely absence of great crested newt (*Triturus cristatus*) within water bodies on and within 500m of the sites. This report summarises the findings of great crested newt surveys carried out in 2011 and provides a summary of the great crested newt (GCN) interest of the Associated Development sites.

1.3 Legislation

Details of the legislation that relates to great crested newt are provided in Appendix A.

2. Methods

2.1 Desk Study

In 2007 and 2010 AMEC conducted survey work to establish the presence / likely absence of great crested newt within water bodies on and within 500m of the proposed development area for Sizewell C[1,2]. The results from this study were used to inform the current survey.

The Suffolk Biological Records Centre (SBRC) was contacted for GCN records to a distance of 1km from the site boundaries of all associated development sites and water bodies within 500m of each site were identified using satellite imagery, and the relevant OS base maps.

2.2 Screening

2.2.1 Desk Study

During the desk study 61 water bodies were identified within 500m of all associated development sites (sites 1-19 inclusive). These were screened prior to conducting field surveys. The screening process used satellite imagery and OS base maps to identify which ponds were separated from associated development sites by barriers preventing great crested newt movement between water bodies and the site. Such barriers include major roads and large rivers. Ponds which were regarded as separated by barriers were 'screened out' from the need for further survey.

2.2.2 Field Study

29 water bodies identified during the desk study were visited in March 2011 during Extended Phase 1 Habitat Surveys[1], to determine their suitability to support great crested newt. Each water body was assessed using the Great Crested Newt Habitat Suitability Index (HSI). The HSI is a numerical index, derived by scoring a range of habitat variables, according to available guidance[3],[4], where: <0.5= poor, 0.5-0.59=below average, 0.6-0.69=average, 0.7-0.79=good, and >0.8-1=excellent. The results from this exercise helped to inform which ponds had habitats suitable to support GCN and would therefore require a presence/absence survey, and which ponds were unsuitable to support GCN and could be screened out from further survey.

[1] Entec UK Ltd (2007) *Great Crested Newt Report: Sizewell*, Entec, Gosforth

[2] Entec UK Ltd (2010) *Great Crested Newt Report: Sizewell*, Entec, Gosforth

[3] Oldham, R. S., Keeble, J., Swan, M. J. S., and Jeffcote, M. (2000). Evaluating the suitability of habitat for the great crested newt (*Triturus cristatus*). *Herpetological Journal*. **10**: 143-155.

[4] Updated guidelines available from: http://www.narrs.org.uk/naspack.htm

2.3 Presence/Absence Surveys

Presence/absence surveys were carried out at 3 water bodies that were considered suitable for breeding great crested newt following the screening exercise. Each water body was surveyed four times in suitable weather conditions between mid-March and mid-June, (with two visits between mid-April and mid-May), during which at least three of the following methods were employed on each survey visit, according to best practice guidelines[5].

- Bottle-trapping – bottle traps made from two-litre plastic bottles were secured to the substrate using a bamboo cane. The traps were set at a density of approximately one per two metres around accessible sections of the water body margins. The traps were set each evening between 1930 and 2130 hours and retrieved between 0600 and 0800 hours the following morning, with any amphibians captured recorded and released.
- Torch-light survey – accessible sections of water body margins were slowly walked, whilst shining the light of a 500,000-1,000,000 candle power torch into the water and recording any amphibians observed. This method was employed during the period between dusk and midnight.
- Egg search - marginal submerged macrophytes were inspected for the presence of great crested newt eggs.
- Netting survey – the perimeter of the water body was walked at dusk using a long-handled dip-net to sample the edge. The sampling effort aimed to involve a minimum of 15 minutes of netting per 50m of shoreline.

Suitable weather conditions for amphibian surveys occur under night-time air temperatures of more than 5°C. Torch surveys also require little/no wind and rain, and bottle trapping was avoided under high temperatures where oxygen levels in the water are reduced, therefore increasing the potential for causing harm to trapped animals.

2.4 Personnel

All surveys were led by AMEC Ecologists Katheryn Leggat (Natural England Licence No. 20113863) and Alastair Miller (Natural England Licence No. 20111647).

2.5 Constraints

It was not possible to gain access to survey every water body identified and screened in during the desktop study, owing to difficulty in obtaining landowner permission where ponds were located on private land. In total, 20 ponds which were screened in as potentially suitable to support GCN at the desk study stage could not be accessed in the field for a further assessment of the habitats. Also 12 ponds which were assessed at a distance from public rights of way during the field screening exercise as being suitable to support GCN could not be accessed for presence/absence surveys. All water bodies which could not be accessed for initial habitat

[5] English Nature (2001). *Great crested newt mitigation guidelines.* Peterborough, English Nature.

assessments or further presence/absence surveys are detailed in Table B1 (Appendix B) and illustrated in Figures 3.1-3.7 (Appendix C).

3. Results

3.1 Desk Study

The Sizewell Great Crested Newt Surveys 2007 and 2010 found no evidence of great crested newt within the study area or in the immediate surrounding area.

The mapping exercise identified a total of 61 discrete water bodies within 500m of the associated development sites.

SBRC returned five records of great crested newt from within 1km of the AD sites as outlined in Table 3.1.

Table 3.1 Records of Great Crested Newt within 1km of AD Sites

AD Site reference	Number of records	Date (most recent)	Distance (m), direction of nearest record from site
Site 1	2	1998	400, E
Site 3	1	1998	1000, N
Site 10	2	2006	580m, N

3.2 Screening

3.2.1 Desk Sudy

12 water bodies were screened out from further survey; these water bodies were separated from the development sites by major rivers, roads or areas of development, these water bodies are detailed in Table B2 (Appendix B) and illustrated in Figures 3.1-3.7 (Appendix C).

3.2.2 Field Study

Table 3.2 presents the habitat descriptions and HSI scores for the 29 ponds that were assessed in the field during the screening process. Pond locations are illustrated on Figures 3.1-3.7. All figures are provided in Appendix C.

Table 3.2 Habitat Descriptions, HSI Scores and further Survey Requirements of Accessible Water Bodies

Pond ID6	Description	HSI Score	Presence/ absence survey required
WB1	Still, supporting a range of aquatic plant life with 90% of the water surface being covered by pond weed (*Potamogeton sp*). Shaded on 75% of its margins with adjacent habitat consisting of woodland and drainage ditches.	0.80 Excellent	Yes
WB2	A swimming pool.	-	-
WB3	Assessed visually from 20m as access was not possible. Situated in a wooded garden the pond consisted of an open water body with well established aquatic vegetation.	0.74 Good	Yes
WB4	Pond not present.	-	-
WB5	Pond not present.	-	-
WB6	Still, supporting a range of aquatic plant life with 75% of the water surface being covered by pond weed. Shaded on 80% of its margins with adjacent habitat consisting of a small woodland copse and hedgerows and field boundaries. Signs of wildfowl.	0.68 Average	Yes
WB8	A large farmyard pond with slurry running off into the water body. Waterfowl were present while macrophyte cover was limited to 5%. The pond was shaded around 15% of its margin by scrub.	0.44 Poor	No
WB9	A large pond situated centrally within a large arable field and surrounded by a broadleaf copse. 65 % of the water body has macrophyte cover with 50% of the pond margin shaded.	0.83 Excellent	Yes
WB10	Pond not present.	-	-
WB11	Pond not present.	-	-
WB12	Assessed visually from 10m as access was not possible. Situated in a garden the pond consisted of an open water body with well established aquatic vegetation, with adjacent hedges.	0.77 Good	Yes
WB13	The pond was heavily shaded by oak and willow trees with scrub under storey around 90% of its margins, with macrophyte cover dominating 70% of the water body. The surrounding vegetation consisted of arable land with boundary hedgerows.	0.79 Good	Yes
WB14	The pond was shaded by oak and willow trees with scrub understorey around 80% of its margins, with macrophyte cover present around 25% of the water body. The surrounding vegetation consisted of arable land with boundary hedgerows.	0.74 Good	Yes
WB15	Located adjacent to Brick Kiln Farm this was a fishing pond stocked with fish with a number of wildfowl present. Minimal aquatic vegetation was present while the pond possessed a combination of sheer sides and deep water with a covering of dense bramble and common reed mace (*Typha latifolia).*	0.35 Poor	No
WB16	Pond not present.	-	-
WB17 *	Shallow field pond with limited aquatic or emergent vegetation, prone to drying up during the summer.	0.44 Poor	Yes

[6] Water body references correspond to those in Associated Development site Phase 1 Reports (AMEC, 2011).

Pond ID6	Description	HSI Score	Presence/ absence survey required
WB17a	Pond not present.	-	-
Wb17b	Pond not present.	-	-
WB18	A small pond located in a broadleaf copse in the centre of an arable field. The pond is shaded by mature oak trees and dominated by pond weed.	0.41 Poor	No
WB19	The pond is located in a private garden directly adjacent to the site boundary. The pond is shaded around 70% of its margin by mature trees and is littered with dead plant material. Surrounding habitat includes scrub, with nearby hedgerows and ditches.	Good 0.72	Yes
WB20	Assessed visually from 20m away as access was not possible. Situated in a wooded garden, the pond consisted of an open water body with well established aquatic vegetation.	Excellent 0.81	Yes
WB21	Assessed visually from 20m away as access was not possible. Small garden pond, with 60% shaded margins and 20% of the pond covered with aquatic vegetation. The surrounding habitat consists of hedgerows and amenity lawn.	Good 0.71	Yes
WB23	Located within broadleaf woodland along the western site boundary The pond is thought to be permanent and contains 25% cover of aquatic vegetation and is shaded around 75% of its margin by surrounding trees and scrub.	Average 0.63	Yes
WB24	A large still pond with shading over 50% of the margins and a 40% cover of aquatic vegetation. Terrestrial habitat consists of a surrounding woodland copse and arable fields with field margins and hedgerows.	Excellent 0.89	Yes
WB29	Pond situated in an arable field, Limited aquatic vegetation, multiple mallard ducks present; some fringing common reed mace*).*	Average 0.54	Yes
WB43	Pond not present.	-	-
WB44	Pond not present.	-	-
WB49	Scoped out - large reservoir, fish and waterfowl present	-	-
WB52	Large, fenced off urban water body, with steep sides and dominated by aquatic vegetation with surrounding amenity grassland. The surrounding landscape consists of busy roads and industrial parks.	Poor 0.49	No

* WB 17 received a poor HSI score, however was assessed as potentially suitable to support GCN.

Of the 29 ponds assessed during field surveys, 14 had terrestrial and aquatic habitats considered suitable to support great crested newt and were scoped in for further presence/absence surveys. 15 ponds were screened out as unsuitable, due to a lack of suitable aquatic and/or terrestrial habitat.

Only three water bodies which had habitats assessed as suitable to support great crested newt could be accessed for presence/absence surveys. These ponds are described in Table 3.2 and illustrated in Figures 3.1-3.4.

Table 3.2 Water Bodies Surveyed for Great Crested Newt Presence/Absence

Water body reference number (see Figures 3.1 and 3.2)	Description	AD Site within 500m	Grid reference	Distance (m), direction from site
3	Situated in a wooded garden the pond consists of an open water body with well established aquatic vegetation.	1	TM435637	51, SW
17	Shallow field pond with virtually no aquatic or emergent vegetation, prone to drying up during the summer.	4, 5, 9	TM461626	425, E
23	Located within broadleaf woodland along the western boundary of AD site 10. The pond is thought to be permanent and contains 25% cover of aquatic vegetation and is shaded around 75% of its margin by surrounding trees and scrub.	10	TM405703	0 (within site boundary)

3.3 Presence/Absence Surveys

The results of the presence/absence surveys conducted on water bodies 3, 17 and 23 and the conditions during the surveys are detailed in Tables 3.3-3.5.

Table 3.3 Water Body 3 Survey Results

	Survey conditions				Survey results			
Date	**Precipitation**	**Turbidity**	**Air temp. (^{0}C)**	**Water temp. (^{0}C)**	**Torching**	**Trapping**	**Egg search***	**Netting**
11/5/2011	None	2.0	13	14	1PN	1F, 1PN	GCN and SM eggs	N/A
12/5/2011	None	2.5	12	13	0	0	N/A	N/A
1/6/2011	None	0	13	14	N/A	0	N/A	N/A
2/6/2011	None	0	15	15	0	0	N/A	N/A

Turbidity is measured on a scale of 1-3.

M = male great crested newt, F = female great crested newt, J = juvenile great crested newt, PN = palmate newt, SN = smooth newt, SM = small newt (palmate or smooth)

* = Once presence of great crested newt eggs had been confirmed egg searches were not continued to avoid unnecessary damage to eggs.

N/A = denotes survey method was not used.

Table 3.4 Water Body 17 Survey Results

	Survey conditions				Survey results			
Date	**Precipitation**	**Turbidity**	**Air temp (^{0}C)**	**Water temp (^{0}C)**	**Torching**	**Trapping**	**Egg search***	**Netting**
12/5/2011	None	2.5	12	11	0	0	0	N/A
1/6/2011	None	1.0	13	15.7	0	Water levels too low	0	N/A
2/6/2011	None	1.5	14	17.7	0	Water levels too low	N/A	N/A

Pond dried up, further survey was not possible.

Footnotes: see Table 3.3.

Table 3.5 Water Body 23 Survey Results

	Survey conditions				Survey results			
Date	**Precipitation**	**Turbidity**	**Air temp. (^{0}C)**	**Water temp. (^{0}C)**	**Torching**	**Trapping**	**Egg search***	**Netting**
14/4/2011	None	3.0	10	11	0	0	0	N/A
11/5/2011	None	3.0	13	14	0	0	0	N/A
12/5/2011	None	2.5	12	13	0	0	0	N/A
8/6/2011	None	2.5	14	15	0	0	0	N/A

Footnotes: see Table 3.3.

One adult female great crested newt was recorded in water body 3 on one occasion along with two records of female palmate newt (*Lissotriton helveticus*) in the same water body. An egg search of this pond revealed the presence of great crested newt and small newt eggs[7]. No other newts or signs indicating their presence were recorded at any other water body.

[7] References to 'small newts' may refer to either smooth newts (*Lissotriton vulgaris*) or palmate newts, the females of which are difficult to tell apart from a torch survey; both the egg and the larval forms are also difficult to distinguish.

4. Conclusions

A total of 29 ponds within 500m of AD Sites 1, 3, 9, 10, 11, 16 and 18 were assessed in the field for their suitability to support great crested newts. It is considered that 14 of these ponds had habitats suitable to support this species. During the desk study an additional 20 ponds were identified as potentially suitable to support great crested newts; however, their habitats could not be assessed in the field due to their location on private property.

Owing to difficulties with obtaining permission to access private land, only three ponds were subject to presence/absence surveys for great crested newt. Single records of great crested newt and palmate newt were recorded in water body 3 only. Water body 3 is located 51m to the southwest of AD Site 1, and is well connected to the site via a wooded garden and hedgerow. The habitats within Site 1 provide limited habitat suitability for great crested newt, with no water bodies offering breeding habitat, and the majority of the site comprising intensively farmed arable fields. Nevertheless, field margins provide ruderal vegetation, tussocky grassland and scrub suitable to support newts, while a small woodland copse and pile of earth covered rubble in the centre of the site may provide hibernation opportunities. Great crested newt may therefore be present on the site.

Appendix A
Legislation relating to Great Crested Newt

Great Crested Newt

Great crested newt is listed in Schedule 5 of *The Wildlife and Countryside Act 1981* (as amended). The Act transposes into UK law the Convention on the Conservation of European Wildlife and Natural Habitats (commonly referred to as the 'Bern Convention'). Great crested newt is listed on Schedule 5 of the Act in respect of Section 9, which makes it an offence, *inter alia*, to:

- intentionally or recklessly kill, injure, or take (handle) a great crested newt;
- intentionally or recklessly damage, destroy or obstruct access to any structure or place that a great crested newt uses for shelter or protection; or
- intentionally or recklessly disturb a great crested newt while it is occupying a structure or place that it uses for shelter or protection.

Great crested newt receives further protection under Regulation 41 of *The Conservation of Habitats and Species Regulations 2010*, which make provision for the purpose of implementing European Union Directive on the Conservation of Natural Habitats and of Wild Fauna and Flora 1992. Great crested newt is listed on Annex IV of the Directive, which means that member states are required to put in place a system of strict protection as outlined in Article 12, and this is done through inclusion on Schedule 2 of the Regulations, which makes it an offence, *inter alia*, to:

- deliberately capture, injure or kill any great crested newt;
- deliberately disturb a great crested newt, in particular any disturbance which is likely:

  (a) to impair their ability:

  (i) to survive, to breed or reproduce, or to rear or nurture their young; or

  (ii) to hibernate or migrate

  (b) to affect significantly the local distribution or abundance of great crested newt; or
- damage or destroy a breeding site or resting place of a great crested newt.

Appendix B
Water Bodies

Table B.1 Water Bodies Potentially Suitable to Support Great Crested Newts, which were Inaccessible for Preliminary Habitat Assessment or Presence/Absence Surveys

Water body reference Number*	Water body name	Surveys carried out	AD site within 500m	Distance (m), direction to nearest AD Site
WB1	Buckleswood Road Pond	HSI conducted; no access for presence/absence survey	1	276, SW
WB6	Hill Farm Copse Pond	HSI conducted; no access for presence/absence survey	1	451, N
WB7	Hill Farm Field Pond	No access for any field surveys.	1	400, N
WB9	Aldhurst Copse Pond 1	HSI conducted; no access for presence/absence survey	1,2,3	146, S
WB12	Abbey Farm Pond 1	HSI conducted; no access for presence/absence survey	1,2	386, N
WB13	Abbey Farm Pond 2	HSI conducted; no access for presence/absence survey	1,2	400, N
WB14	Abbey Farm Garden Pond	HSI conducted; no access for presence/absence survey	1,2	277, N
WB18	Field Copse Pond	HSI conducted; no access for presence/absence survey	10,11	120, SW
WB19	Moate Hall Pond	HSI conducted; no access for presence/absence survey	10,11	3, E
WB20	Moate Hall Garden Pond 1	HSI conducted no access for presence/absence survey	10,11	50, E
WB21	Moate Hall Garden Pond 2	HSI conducted; no access for presence/absence survey	10,11	50, E
WB22	White House Farm Pond	No access for any field surveys.	10,11	67 E
WB24	Sillett's Wood Pond	HSI conducted; no access for presence/absence survey	10	473, N
WB25	Willow Marsh Pond 1	No access for any field surveys.	10	413, N

Water body reference Number*	Water body name	Surveys carried out	AD site within 500m	Distance (m), direction to nearest AD Site
WB26	Willow Marsh Pond 2	No access for any field surveys.	10	365, N
WB27	Willow Marsh Pond 3	No access for any field surveys.	10	331, N
WB28a	Oak Spring Pond	No access for any field surveys.	10,11	250, E
WB29	Hall Farm Track Pond	HSI conducted; no access for presence/absence survey	11	40m, E
WB29a	Hall Farm Pond	No access for any field surveys.	10,11	220, SE
WB30	Darsham Old Hall Pond 1	No access for any field surveys.	10,11	125, SE
WB31	Darsham Old Hall Pond 2	No access for any field surveys.	10,11	122, SE
WB32	Darsham Old Hall Pond 3	No access for any field surveys.	10,11	118, SE
WB39	Oak Ground Pond	No access for any field surveys.	17	387, W
WB40	Carlton Hall Wood Pond 1	No access for any field surveys.	17	278, N
WB41	Carlton Hall Wood Pond 2	No access for any field surveys.	17	278, N
WB45	Palant's Grove Pond	No access for any field surveys.	13	350, SW
WB46	Friday Street Pond	No access for any field surveys.	13	175, SW
WB47a	Manor Farm Pond	No access for any field surveys.	13	275, E
WB48	Pettistree Pylons Pond	No access for any field surveys.	16	400, NE
WB50	Wonder Grove Pond 1	No access for any field surveys.	14	197, NE
WB51	Wonder Grove Pond 2	No access for any field surveys.	14	197, NE
WB51a	Borrow Pit Pond	No access for any field surveys.	14	50, E

Key: HSI: Habitat Suitability Index

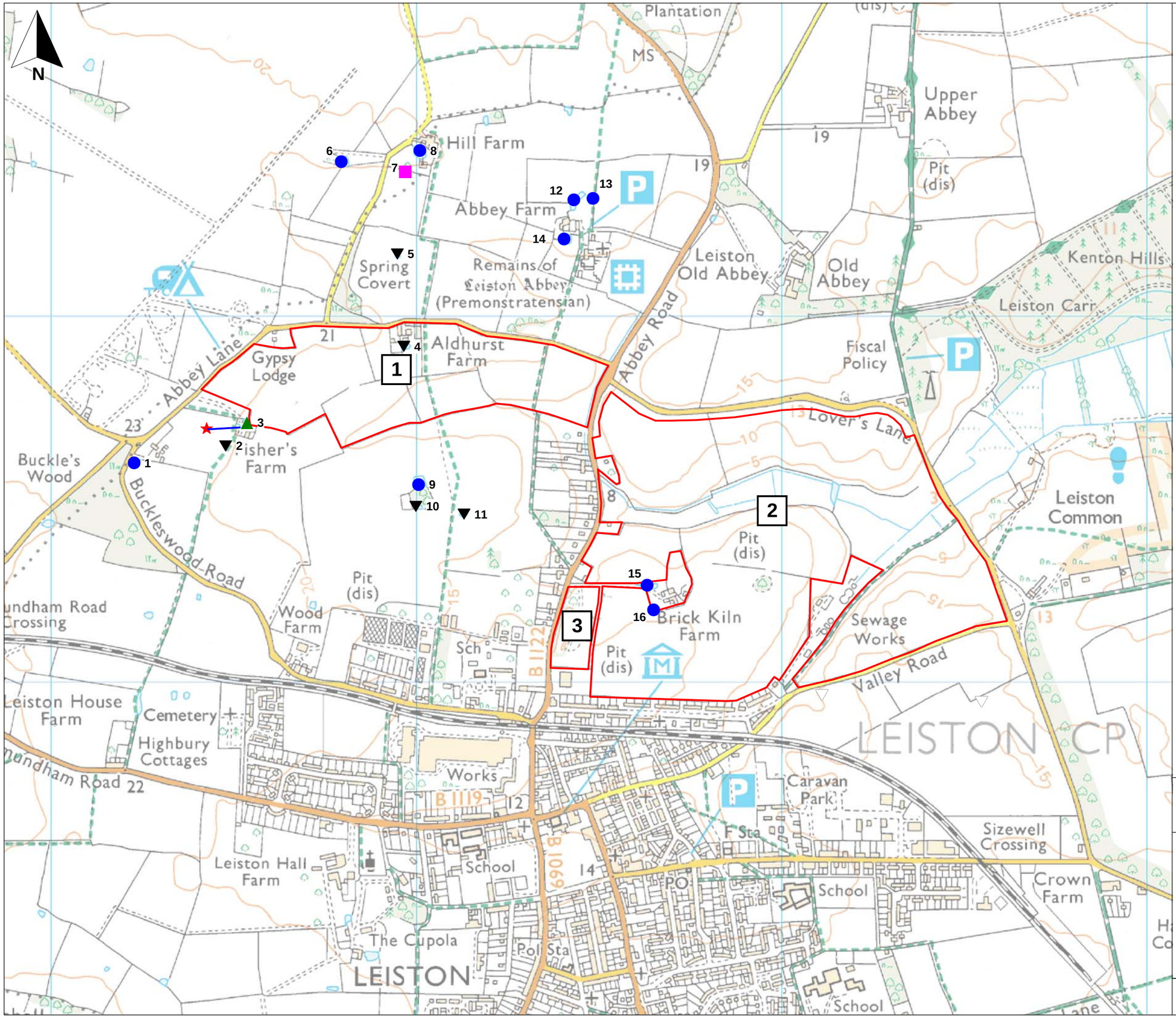
*: Water bodies are illustrated in Figures 3.1- 3.7

Table B.2 Water Bodies Scoped Out from Survey Due to Severance from Associated Development Sites

Water body reference Number	Water body name	AD site within 500m	Reason for scoping decision
WB28	The Street Pond	10	Pond severed from Site 10 due to main road, and beyond 500m from Site 11.
WB32a	Park Farm Field Pond	12	Severed from Site 12 due to main road.
WB33	Park Farm Covert Pond	12	Severed from Site 12 due to main road.
WB34	Hill House Farm Field Pond 1	12	Severed from Site 12 due to main road.
WB35	Hill House Farm Field Pond 2	12	Severed from Site 12 due to main road.
WB36	Hill House Farm Field Pond 3	12	Severed from Site 12 due to main road.
WB37	Burnt House Farm Field Pond 1	12	Severed from Site 12 due to main road.
WB38	Burnt House Farm Field	12	Severed from Site 12 due to main road.
WB42	Carlton Rookery Field Pond	17	Pond severed from Site 17 due to two roads and industrial estate.
WB47	Benhall Lodge Park Pond	13	Severed from Site 13 by A12.
WB53	Square Covert Pond	18,19	Pond severed from Sites 18 and 19 due to main road.
WB54	Square Covert Reservoir	18,19	Pond severed from Sites 18 and 19 due to main road.

*: Water bodies are illustrated in Figures 3.1- 3.7

Appendix C
Figures



Sizewell Associated Development Sites
Great Crested Newt Survey Report

Figure 3.1
Water bodies 1-16

April 2012
28130-A333.wor tugwc

N

Key

- 1 — Associated development site
- Site boundary
- 1 — Water body - HSI and presence/ absence survey conducted
- 1 — Water body - not present

0 m 500 m

Scale 1:10,000 @ A3

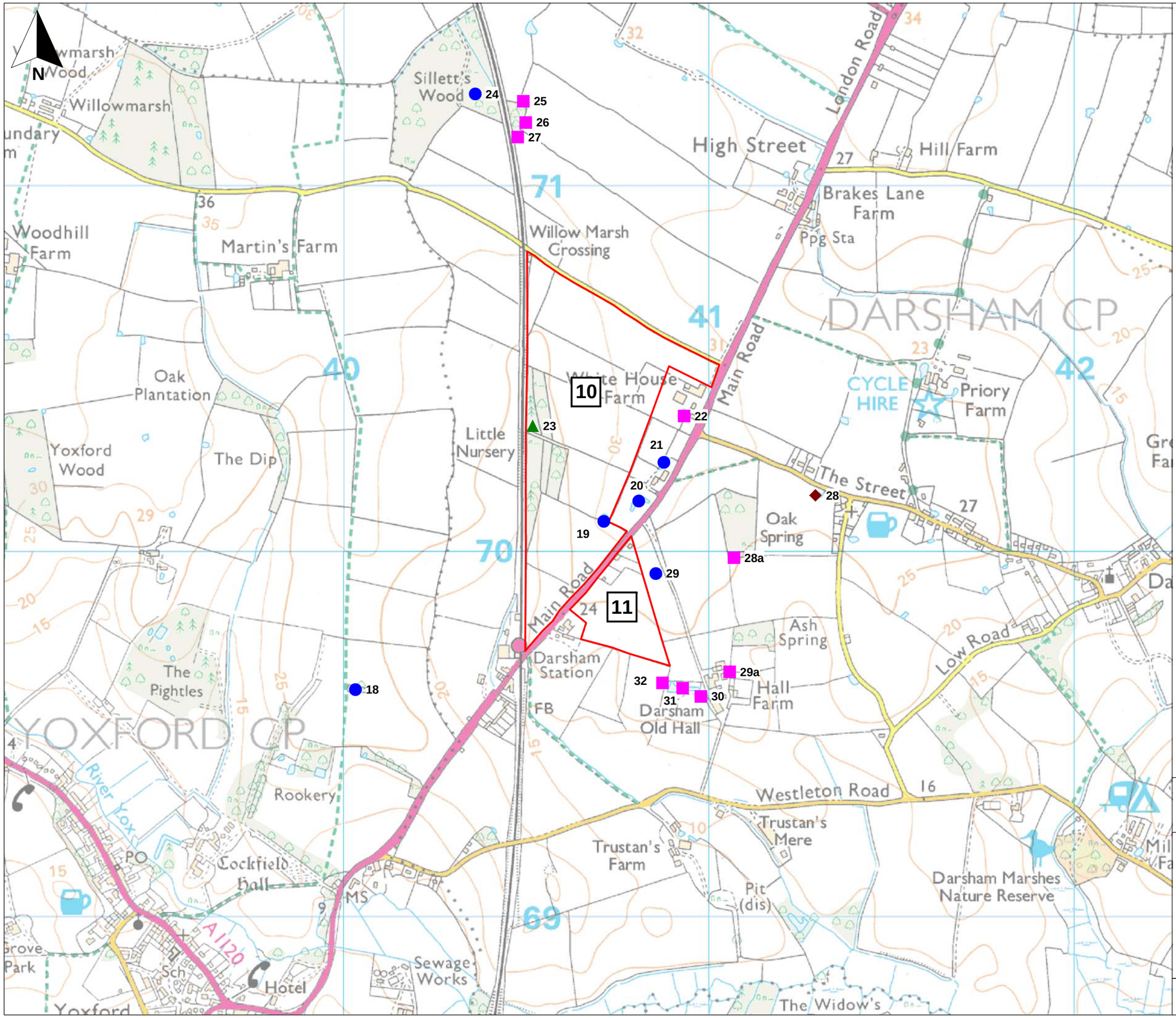
eDF

Sizewell Associated Development Sites
Great Crested Newt Survey Report

Figure 3.2
Water body 17-17b

April 2012
28130-A405.wor tugwc

amec



Key

- 1 — Associated development site
- Site boundary
- 1 — Water body - no access for HSI
- 1 — Water body - HSI conducted
- 1 — Water body - HSI and presence/ absence survey conducted
- 1 — Water body - severed from site

0 m — 500 m

Scale 1:10,000 @ A3

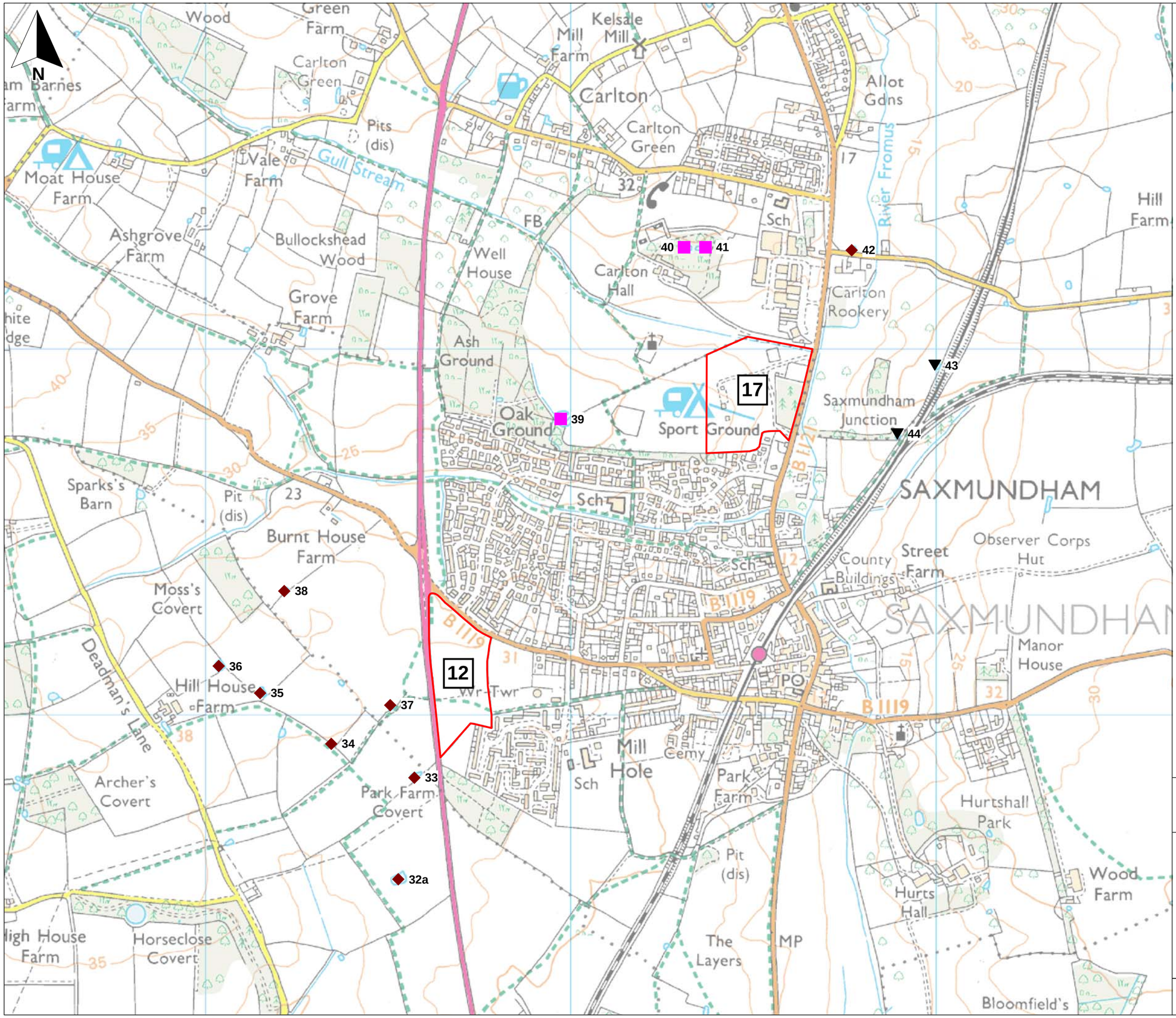
EDF

Sizewell Associated Development Sites
Great Crested Newt Survey Report

Figure 3.3
Water bodies 18-32

April 2012
28130-A334.wor tugwc

amec



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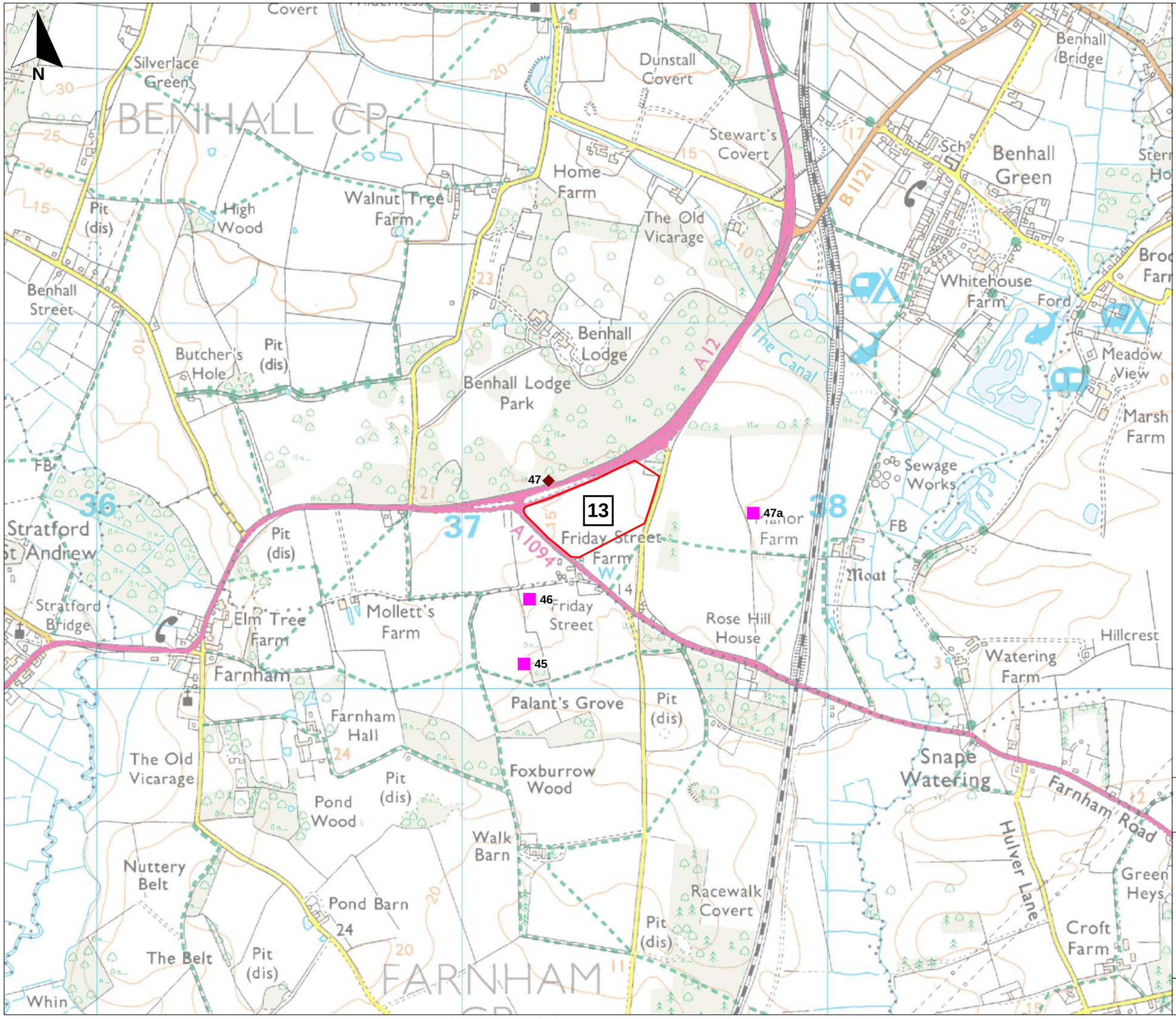
EDF

Sizewell Associated Development Sites
Great Crested Newt Survey Report

Figure 3.4
Water bodies 32a - 44

April 2012
28130-A335.wor tugwc

amec



Key

- 1 — Associated development site
- Site boundary
- 1 — Water body - no access for HSI
- 1 — Water body - severed from site

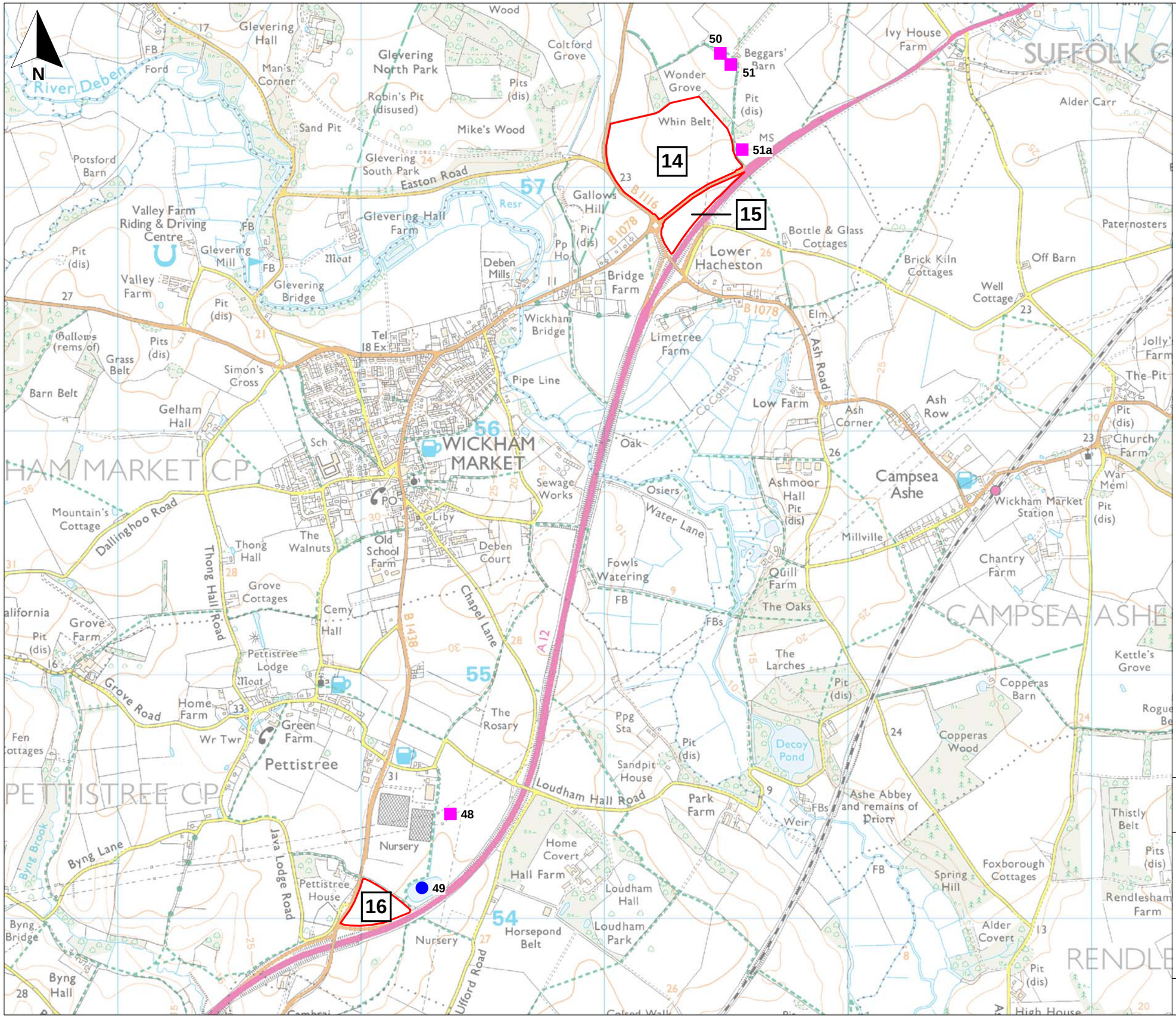
0 m — 500 m

Scale 1:10,000 @ A3

Sizewell Associated Development Sites
Great Crested Newt Survey Report

Figure 3.5
Water bodies 45 - 47a

April 2012
28130-A407.wor tugwc



Key

- 1 — Associated development site
- Site boundary
- 1 — Water body - no access for HSI
- 1 — Water body - HSI conducted

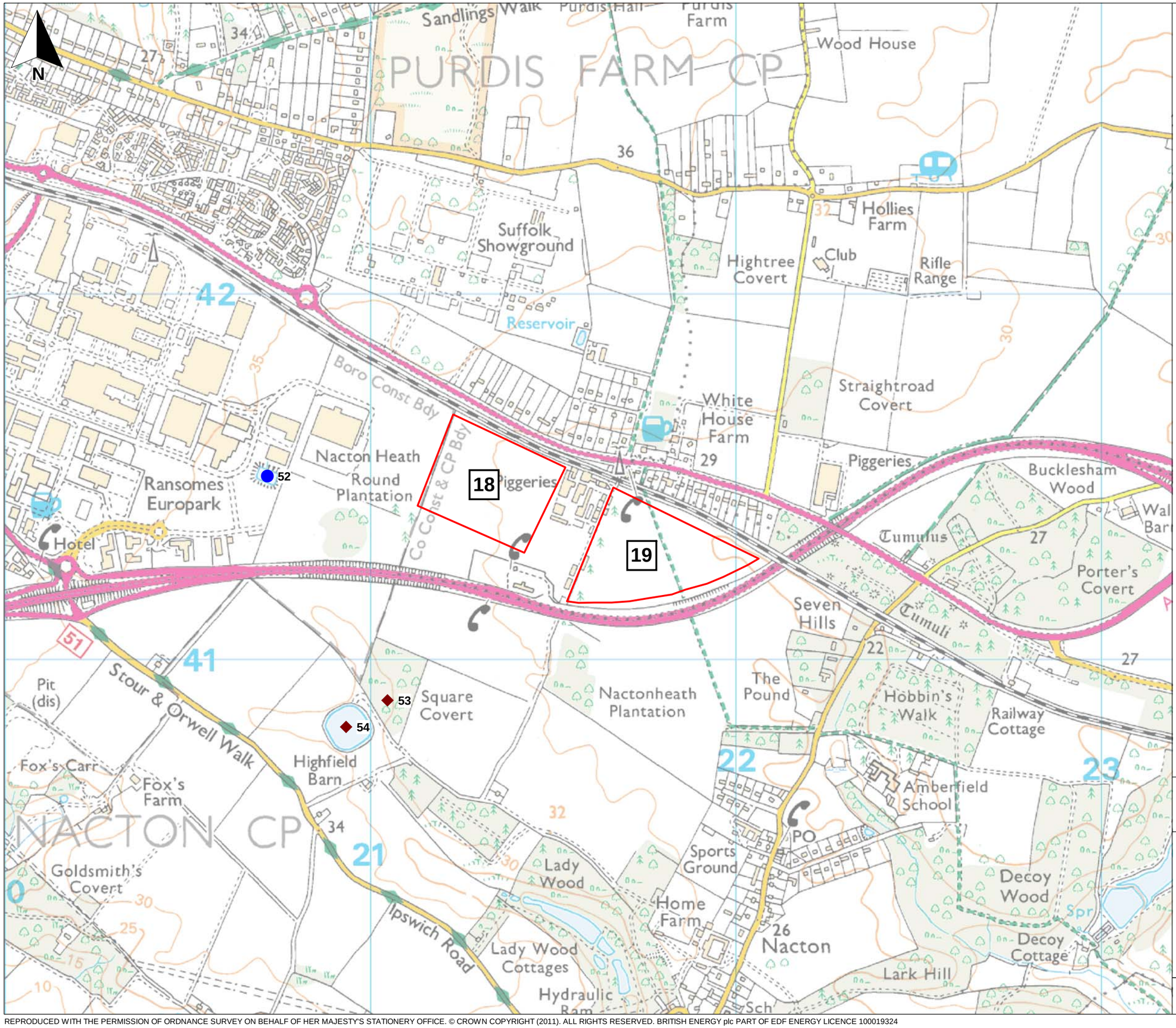
EDF

Sizewell Associated Development Sites
Great Crested Newt Survey Report

Figure 3.6
Water bodies 48 - 51a

April 2012
28130-A408.wor tugwc

amec



Key

- 1 — Associated development site
- Site boundary
- 1 — Water body - HSI conducted
- 1 — Water body - severed from site

eDF

Sizewell Associated Development Sites
Great Crested Newt Survey Report

Figure 3.7
Water bodies 52 - 54

April 2012
28130-A409.wor tugwc

amec

Appendix D
References

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Entec UK Ltd (2007). *Great Crested Newt Report: Sizewell*. Entec, Gosforth.

Entec UK Ltd (2010). *Great Crested Newt Report: Sizewell*. Entec, Gosforth.

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VOLUME 4, CHAPTER 7, APPENDIX 7A: ANNEX 7A.4: PRIMARY DATA

Contents

Tables

Plates

None provided.

Figures

All figures are found within Annex 7A.1 of Appendix 7A: Ecological Baseline for the Southern Park and Ride at Wickham Market. Note only those figures referenced in this Annex have been listed below.

Figure 7.1: Location of Non-statutory Designated Sites within 2km of the southern park and ride at Wickham Market

Figure 7.2: Phase 1 Habitat Plan

Figure 7.3: Southern park and ride at Wickham Market Great Crested Newt Surveys

Figure 7.7: Southern park and ride at Wickham Market Bat Tree Assessment Results 2015

Figure 7.8: Southern park and ride at Wickham Market Activity Transect Routes and SM2 Locations 2014

Figure 7.9: Location of common pipistrelle passes recorded during at southern park and ride at Wickham Market activity transect routes 1 and 2 May to October 2014

Figure 7.10: Location of soprano pipistrelle passes recorded during at southern park and ride at Wickham Market activity transect routes 1 and 2 May to October 2014

1 Introduction

1.1.1 This Annex provides details of the primary data collected for the southern park and ride at Wickham Market (hereafter referred to as the proposed development). For the purpose of this Annex, the southern park and ride at Wickham Market site is referred to as the "site".

1.1.2 No targeted surveys were undertaken for invertebrates, reptiles and terrestrial mammals because, from the Extended Phase 1 habitat survey/protected species walkover, no evidence for the potential presence of these taxa of conservation interest was identified. These taxa are therefore not considered within this Annex.

1.2 Plants and Habitats

a) Methodology

i. Extended Phase 1 habitat and protected species walkover survey

1.2.1 An extended Phase 1 habitat and protected species walkover survey was undertaken by Arcadis Consulting (UK) Limited (Arcadis) on 10 April 2014. The survey area consisted of the site and adjacent habitats (see **Figure 7.1** in **Annex 7A.1**).

1.2.2 The survey involved identifying and mapping the dominant habitat types following the Phase 1 habitat survey methodology recommended by Natural England (Ref. 1.1). Dominant plant species were noted, as were any uncommon species or species indicative of particular habitat types. Botanical names follow 'New Flora of the British Isles' (Ref. 1.2). Any non-native invasive species present within and adjacent to the site (for example Japanese Knotweed (*Fallopia japonica*)) were recorded.

1.2.3 Particular attention was paid to the hedgerows and trees, and the status of each hedge with regard to the Hedgerows Regulations (Ref. 1.3) was also assessed using the Wildlife and Landscape Criteria. Further detail of the assessment of hedgerows is detailed in **Section 1.2a)ii**.

1.2.4 The survey was extended to involve a critical assessment of the value of the habitats present for their use by protected species or species of conservation interest, as outlined below:

- The value of the site for invertebrates was assessed and any habitats or features of particular value were identified.

- The value of the site for reptiles was assessed and any habitats or features of particular value for reptiles were identified.
- The value of the site for breeding birds was assessed.
- An external inspection of all trees on site was carried out to assess their suitability for occupancy by roosting and/or hibernating bats. The likely value of the various habitat features for foraging and commuting bats was also critically assessed.
- The site was investigated for its use by badgers (*Meles meles*) by searching for the characteristic signs of badger activity including setts, latrines, paths, footprints, hairs, and feeding signs. The survey area was extended where necessary in order to search adjacent areas for badger setts.
- The site was assessed for its potential to be used by dormice (*Muscardinus avellanarius*) and the connectivity of the site to areas of woodland habitat in the surrounding area.

1.2.5 In 2018, a review of aerial photographs and a site visit was conducted to check site conditions since the original 2014 extended Phase 1 habitat survey/protected species walkover.

ii. Hedgerow regulations

1.2.6 These Hedgerows Regulations only apply to hedgerows adjacent to land in agricultural/horticultural use. A hedgerow may be classified as 'important' for archaeological/historical reasons, or according to the Wildlife and Landscape criteria. To be classified as 'important' under the Wildlife and Landscape criteria, the hedgerow must be over 30 years old and should comprise one of the following:

- at least seven woody species/30m[1];
- at least six woody species/30m and at least three features[1];

[1] If the hedgerow is situated wholly or partly in one of the counties listed in Criteria 7 sub-paragraph (2) of the Hedgerows Regulations, the number of woody species should be reduced by one. Note that Suffolk is not one of the counties listed in Criteria 7 sub-paragraph (2) of the Hedgerow Regulations and therefore is not subject to this reduction.

- at least six woody spp/30m including any one of Pn/Sot/Tic/Tip (see **Table 1.1**)[1];
- *at least five woody species and at least four features; and
- or if adjacent to a bridleway/footpath, at least four woody species and at least two features.

1.2.7 Note that a hedgerow may also be classified as 'important' due to the presence/recorded presence of particular animal and plant species (see Criteria 6 sub-paragraphs (1)-(4) of the Hedgerows Regulations for details (Ref. 1.3)).

1.2.8 The woody species 'recognised' by the Hedgerows Regulations are listed in **Table 1.1** below, along with the species codes to be used on the record sheet:

Table 1.1: Woody species recognised by Hedgerows Regulations

Spp code	Latin name	English name	Spp code	Latin name	English name
Ac	*Acer campestre*	Field Maple	**Pa**	*Prunus avium*	Wild Cherry
Ag	*Alnus glutinosa*	Alder	**Pp**	*Prunus padus*	Bird Cherry
Bpe	*Betula pendula*	Silver Birch	**Ps**	*Prunus spinosa*	Blackthorn
Bpu	*Betula pubescens*	Downy Birch	**Pyc**	*Pyrus communis*	Pear
Bxs	*Buxus sempervirens*	Box	**Qp**	*Quercus petraea*	Sessile Oak
Cb	*Carpinus betulus*	Hornbeam	**Qr**	*Quercus robur*	Pedunculate Oak
Cos	*Cornus sanguinea*	Dogwood	**Rc**	*Rhamnus cathartica*	Buckthorn
Ca	*Corylus avellana*	Hazel	**Ruv**	*Ribes uva-crispa*	Gooseberry
Cla	*Crataegus laevigata*	Midland Hawthorn	**Ros**	*Rosa* sp(p)	Rose
Cm	*Crataegus monogyna*	Hawthorn	**Rac**	*Ruscus aculeatus*	Butcher's-broom
Cys	*Cytisus scoparius*	Broom	**Sx**	*Salix* sp(p)	Willow
Dl	*Daphne laureola*	Spurge-laurel	**Sxv**	*Salix viminalis*	Osier
Ee	*Euonymus europaeus*	Spindle	**Sn**	*Sambucus nigra*	Elder
Fs	*Fagus sylvatica*	Beech	**Sac**	*Sorbus aucuparia*	Rowan
Fa	*Frangula alnus*	Alder Buckthorn	**Sor**	*Sorbus* sp(p)	Whitebeam

Spp code	Latin name	English name	Spp code	Latin name	English name
Fe	*Fraxinus excelsior*	Ash	**Sot**	*Sorbus torminalis*	Wild Service-tree
Hr	*Hippophae rhamnoides*	Sea-buckthorn	**Tb**	*Taxus baccata*	Yew
Ia	*Ilex aquilfolium*	Holly	**Tic**	*Tilia cordata*	Small-leaved Lime
Jr	*Juglans regia*	Walnut	**Tip**	*Tilia platyphyllos*	Large-leaved Lime
Jc	*Juniperus communis*	Common Juniper	**Ue**	*Ulex europaeus*	Gorse
Liv	*Ligustrum vulgare*	Wild Privet	**Ug**	*Ulex gallii*	Western Gorse
Ms	*Malus sylvestris*	Crab Apple	**Umi**	*Ulex minor*	Dwarf Gorse
Pal	*Populus alba*	White Poplar	**Um**	*Ulmus* sp(p)	Elm
Pn	*Populus nigra sub-species betulifolia*	Black-poplar	**Vl**	*Viburnum lantana*	Wayfaring-tree
Pot	*Populus tremula*	Aspen	**Vop**	*Viburnum opulus*	Guelder Rose
an	*Populus x canescens*	Grey Poplar			

1.2.9 The presence of several features along a hedgerow influences the classification under the Hedgerows Regulations. The terms used to describe these features, and other additional terms, on the record sheet are explained in **Table 1.2**, and their presence in the hedgerow is indicated by a '✓' on the record sheet.

Table 1.2: Explanation of terms used on the Hedgerows Regulations record sheet

Term	Description
Bank/wall	The hedgerow is supported along at least half of its length by a bank/wall.
Bridleway/path	The hedgerow runs parallel to a designated bridleway/footpath.
Connections ≥4 points	A hedgerow must score four or more 'connections points', where connections with an adjoining hedgerow(s) score one point each, and a connection with a pond or woodland (in which the majority of the trees are broad-leaved) scores two points each. A hedgerow is connected if it meets the feature, or if it has a point within 10m of it and would meet it if the line of the hedgerow continued.
Ditch	There is a ditch along at least half of the length of the hedgerow.
Ground flora spp.	A list of the dominant and any notable ground flora species recorded along the hedgerow.
Hedge No.	Hedgerow number (within survey area/site).

Term	Description
Important	Would the hedgerow be classified as 'important' under the Hedgerows Regulations?
Intact	The hedgerow contains less than 10% gaps along its length.
Parallel hedge	A parallel hedgerow is present within 15m.
Pn/Sot/Tic/Tip	The presence of these trees within the hedgerow influences the classification. An explanation of the species codes is given above.
Three flora spp.	The hedgerow supports at least three of the valuable ground flora species defined by the Hedgerows Regulations. The hedgerow is considered to support a plant if it is rooted within 1m (in any direction) of the hedgerow.
Trees	The hedgerow supports at least one standard tree per 50m length of hedgerow (standard trees are defined as those which when measured at 1.3m above ground level have a diameter of at least 20cm, or 15cm for multi-stemmed trees).
Woody species	A list of the woody species found along the hedgerow (this is likely to list more species than are present along 30m length(s)).

1.2.10 **Table 1.3** details valuable ground flora species with regard to the Hedgerows Regulations (Ref. 1.3), while **Table 1.4** details species codes for other species often found in hedgerows.

Table 1.3: Valuable ground flora species with regard to the Hedgerows Regulations (Ref. 1.3)

Spp code	Latin name	English name
Amos	*Adoxa mochatellina*	Moschatel
Ajr*	*Ajuga reptans*	Bugle
Alu*	*Allium ursinum*	Ramsons
An*	*Anemone nemorosa*	Wood Anemone
Amac	*Arum maculatum*	Lord's-and-Ladies
Aff*	*Athyrium filix-femina*	Lady-fern
Bsp*	*Blechnum spicant*	Hard-fern
Bs*	*Brachypodium sylvaticum*	False Brome
Bram	*Bromopsis ramosa*	Hairy Brome
Clat	*Campanula latifolia*	Giant Bellflower
Ctra	*Campanula trachelium*	Nettle-leaved Bellflower
Cxsy	*Carex sylvatica*	Wood Sedge
Cl*	*Circaea lutetiana*	Enchanter's Nightshade
Cmaj	*Conopodium majus*	Pignut
Daff	*Dryopteris affinis*	Scaly Male-fern
Dcar	*Dryopteris carthusiana*	Narrow Buckler-fern

Spp code	Latin name	English name
Dfm	*Dryopteris filix-mas*	Male-fern
Ehel	*Epipactis helleborine*	Broad-leaved Helleborine
Esyl	*Equisetum sylvaticum*	Wood Horsetail
Eamy	*Euphorbia amygdaloides*	Wood Spurge
Fgig	*Festuca gigantea*	Giant Fescue
Fv*	*Fragaria vesca*	Wild Strawberry
Godo	*Galium odoratum*	Woodruff
Gsx*	*Galium saxatile*	Heath Bedstraw
Gro*	*Geranium robertianum*	Herb-Robert
Gu*	*Geum urbanum*	Wood Avens
Hn*	*Hyacinthoides non-scripta*	Bluebell
Lgal	*Lamiastrum galeobdolon*	Yellow Archangel
Lsqu	*Lathraea squamaria*	Toothwort
Ls*	*Luzula sylvatica*	Great Wood-rush
Lnem	*Lysimachia nemorum*	Yellow Pimpernel
Mpra	*Melampyrum pratense*	Common Cow-wheat
Msyl	*Melampyrum sylvaticum*	Small Cow-wheat
Muni	*Melica uniflora*	Wood Melick
Mp*	*Mercurialis perennis*	Dog's Mercury
Meff	*Milium effusum*	Wood Millet
Omas	*Orchis mascula*	Early –purple Orchid
Oxa*	*Oxalis acetosella*	Wood Sorrel
Pqua	*Paris quadrifolia*	Herb Paris
Psco	*Asplenium scolopendrium*	Hart's-tongue
Pnem	*Poa nemoralis*	Wood Meadow-grass
Pvul	*Polypodium vulgare*	Polypody
Pacu	*Polystichum aculeatum*	Hard Shield-fern
Pset	*Polystichum setiferum*	Soft Shield-fern
Pere	*Potentilla erecta*	Tormentil
Pste	*Potentilla sterilis*	Barren Strawberry
Pela	*Primula elatior*	Oxlip
Pvul	*Primula vulgaris*	Primrose
Raur	*Ranunculus auricomus*	Goldilocks Buttercup
Sne*	*Sanicula europaea*	Sanicle
Tsn*	*Teucrium scorodonia*	Wood Sage

Spp code	Latin name	English name
Vmon	*Veronica montana*	Wood Speedwell
Vodo	*Viola odorata*	Sweet Violet
Vrei	*Viola reichenbachiana*	Early Dog-violet
Vriv	*Viola riviniana*	Common Dog-violet

*Denotes code taken from Phase 1 handbook.

Table 1.4: Species codes for other species often found in hedgerows

Spp code	Latin name	English name
Ae	*Arrhenatherum elatius*	False Oat-grass
Agt	*Agrostis stolonifera*	Creeping Bent
Apet	*Alliaria petiolata*	Garlic Mustard
Aste	*Anisantha sterilis*	Barren Brome
Asy*	*Anthriscus sylvestris*	Cow Parsley
At	*Agrostis capillaris*	Common Bent
Car*	*Cirsium arvense*	Creeping Thistle
Cha	*Chamanerion angustifolium*	Rosebay willowherb
Cop*	*Chrysosplenium oppositifolium*	Opposite-leaved Golden-saxifrage
Cxrm	*Carex remota*	Remote Sedge
Cyc	*Cynosurus cristatus*	Crested dog's-tail
Ddl*	*Dryopteris dilatata*	Broad Buckler-fern
Dp*	*Digitalis purpurea*	Foxglove
Ephir	*Epilobium hirsutum*	Greater Willowherb
Fu*	*Filipendula ulmaria*	Meadowsweet
Gap*	*Galium aparine*	Cleavers
Gh*	*Glechoma hederacea*	Ground-ivy
Gmol	*Galium mollugo*	Hedge Bedstraw
Gro	*Geranium robertianum*	Herb-Robert
Hh*	*Hedera helix*	Ivy
Hl*	*Holcus lanatus*	Yorkshire-fog
Hlup	*Humulus lupulus*	Hop
Ig*	*Impatiens glandulifera*	Indian Balsam
Lped	*Lotus pedunculatus*	Greater Bird's-foot-trefoil
Lpc*	*Lonicera periclymenum*	Honeysuckle
Ocro	*Oenanthe crocata*	Hemlock Water-dropwort

Spp code	Latin name	English name
Oreg	*Osmunda regalis*	Royal Fern
Pt*	*Pteridium aquilinum*	Bracken
Pver	*Primula veris*	Cowslip
Rf*	*Rubus fruticosus agg.*	Bramble
Sd	*Solanum dulcemara*	Bittersweet
Shol	*Stellaria holostea*	Greater Stitchwort
Ssyl	*Stachys sylvatica*	Hedge Woundwort
So	*Smyrnium olusatrum*	Alexanders
Hand	*Hypericum androsaemum*	Tutsan
Ud*	*Urtica dioica*	Common Nettle
Vio	*Viola sp*	Violet species
Vm	*Vaccinium myrtillus*	Bilberry
Vriv	*Viola riviniana*	Common Dog-violet

*Denotes code taken from Phase 1 handbook.

b) Results

i. Extended Phase 1 habitat and protected species survey walkover

1.2.11 **Table 1.5** details the Target Notes of the 2014 extended Phase 1 habitat and protected species walkover survey. The results of the extended Phase 1 habitat and protected species walkover survey and Target Notes are on **Figure 7.2, Annex 7A.1.**

Table 1.5: Extended Phase 1 Habitat Survey and Protected Species Target Notes from Arcadis surveys in 2014

Target Note number	Description
1	Broad-leaved plantation woodland. Tree species present included Field Maple, Sweet Chestnut (*Castanea sativa)* and English Elm (*Ulmus procera)*. The ground flora was dominated by Common Nettle) and Cow Parsley, with Lords-and-Ladies also present. Trees were all fairly small, approximately 10-20 years old, and had no obvious bat roost potential.
2	An area of improved grassland used as a bike/go-kart track. Raised banks with tall ruderal vegetation cover were adjacent to the track, with species present including Hemlock (*Conium maculatum*).
3	Badger sett on the bike track bank. At least five active entrances were present, and two disused entrances. This is a potential main sett, located approximately 130m from the proposed site boundary. A badger was disturbed during surveys,

Target Note number	Description
	and seen escaping into undergrowth along the bank, and badger hairs were found at two of the sett entrances.
4	An area of tall ruderal vegetation approximately 30m by 50m in size. The site had potential to support common reptile species. Common Nettle and Hemlock were the dominant species present.
5	Broad-leaved plantation woodland supporting some ornamental species. Species present included Horse-chestnut (*Aesculus hippocastanum*), Sycamore (*Acer pseudoplatanus*), Cherry Laurel (*Prunus laurocerasus*) and Scot's Pine (*Pinus sylvestris*). Ground flora was sparse, but included Cow Parsley, Lords-and-Ladies and Common Nettle. There were also three to four mature Oak trees (*Quercus* spp.) to the south-west of the plantation that exhibited features with potential to support roosting bats.
6	Two previously scoped ponds, with potential for supporting great crested newts (*Triturus cristatus*). The surrounding woodland also provided suitable foraging habitat and hibernacula for this species.
7	Broad-leaved plantation woodland containing a pheasant-rearing pen to the east. Some open areas within the plantation supported grass tussocks, wood piles and exposed tree roots, and had the potential to support reptiles. A mature Oak tree was present within the woodland, although no features with potential to support roosting bats were identified. The pond to the west of the plantation was dry at the time of the survey.
8	A mature Oak tree with features suitable for supporting roosting bats, including raised bark and split limbs. The adjacent track also provided good foraging and commuting opportunities for bats.
9	An area of broad-leaved semi-natural woodland comprising mostly semi-mature trees. Tree species present included Ash, Oak and Sycamore, with an understory of Hawthorn and Elder. The ground flora comprised Dog's Mercury, Cleavers, False Brome, Garlic Mustard and *Arum* spp.
10	Broad-leaved semi-natural woodland with tree species including Ash and Field Maple, with an understory of Hazel, Elder and Hawthorn. Ground flora included Cleavers, Red Campion (*Silene dioica*) and Dog's Mercury. Trees present were semi-mature, and may have potential to support roosting bats. Note: Access was not permitted to this area of woodland, but surveyed from the site boundary.
11	Badger latrine at base of hedgerow.
12	Mound of spoil with covering of Brambles, and Common Nettle, adjacent to a dry hollow.

1.2.12 A review of aerial photographs and a 2018 site visit to check site conditions, showed that there were no significant material changes to the habitats

present within the site since the Extended Phase 1 habitat survey in 2014. Therefore, the Extended Phase 1 habitat survey was not repeated by Arcadis.

ii. Hedgerow regulations record sheets

1.2.13 All hedgerows assessed under the Hedgerows Regulations are target-noted with green 'hedgerow numbers' on **Figure 7.2** (**Annex 7A.1**). Species abbreviations follow the 'Handbook for Phase 1 habitat survey' (Ref. 1.1). **Table 1.6** details the Hedgerow Regulations record sheets.

Table 1.6: Hedgerow Regulations record sheets

Hedge No.	H1	H2	H3	H4	H5	H6	H7	H9	H9	H10	H11
Important	×	×	×	×	✓	×	×	×	×	×	×
Bridleway/path	×	×	×	✓	✓	×	×	×	×	×	×
Pn/Sot/Tic/Tip	×	×	×	×	×	×	×	×	×	×	×
No. woody spp./30m	5	2	2	4	6	2	3	2	4	2	3
Bank/wall	×	×	×	×	×	×	×	×	×	×	×
Intact	✓	✓	✓	✓	✓	✓	×	×	×	✓	✓
Trees	×	×	✓	✓	✓	×	✓	×	×	×	✓
3 flora spp.	×	×	×	✓	✓	×	×	×	×	×	×
Ditch	×	×	×	×	✓	×	×	×	×	×	×
Connect >4 points	×	×	×	×	×	✓	×	×	×	×	×
Parallel hedge/Woody spp. present	×	×	×	✓	✓	×	×	×	×	×	×
	Cm	Cm	Cm	Cm	Cm	Cm	Cm	Cm	Cm	Cm	Cm
	Ps	Ps	Ps	Ps	Ps	Sn	Um	Um	Ps	Ps	Ps
	Sn			Sn	Ac		Ros	Liv	Um		Qr
	Ros			Ac	Pa				Ros		
	Um				Sn						
					Ca						
Ground flora (dominant)											
Ground flora (dominant)	Gap	Asy Ud	Asy Gap	Ud Gap Asy	Ud Gap Asy	Gap	Gap	Ud	Ud	Ud	Ud
Other ground flora (including notable species)	So	So			So		So	So	So	So	So

1.3 Amphibians

a) Methodology

1.3.1 A review of Ordnance Survey (OS) maps and aerial photos was carried out to identify any water bodies within 500m of the boundaries of the site (see **Figure 7.3, Annex 7A.1**).

1.3.2 A site visit to each pond was made by Arcadis ecologists between 31 March and 15 April 2014, for each pond where access was granted. During these visits, detailed site descriptions were taken for each water body, including photographs, measurements of the area and depth, descriptions of marginal, aquatic and surrounding vegetation, and a note was made of suitable survey methods for the water body.

1.3.3 Where appropriate, a Habitat Suitability Index for great crested newts (*Triturus cristatus*) (Ref. 1.4) was calculated for each water body. The Habitat Suitability Index scores a water body against ten habitat suitability indices, which include water quality and the likely presence/absence of fish and aquatic plant cover. From these ten suitability indices a geometric mean is calculated, which gives an overall numerical index ranging between zero and one. A score of near zero indicates highly sub-optimal habitat, whilst a score near one represents optimal habitat. Habitat Suitability Index scores are then used to define pond suitability for great crested newts on a categorical scale, from “Poor” to “Below Average”, “Average”, “Good”, and “Excellent”.

1.3.4 The Habitat Suitability Index for each pond was used to compare the general suitability of the ponds present for great crested newts. However, the Habitat Suitability Index is not a substitute for undertaking newt surveys and, if a water body is awarded a high Habitat Suitability Index score, this does not guarantee that great crested newts will be present, only that they are likely to be present.

1.3.5 Targeted great crested newt surveys were undertaken at ponds identified as being potentially suitable for breeding amphibians during the scoping surveys. Four survey visits to each pond were carried out in suitable weather conditions between 14 April and 2 June 2014. Where great crested newts were recorded, an additional two surveys were undertaken (making a total of six surveys) to allow an estimate of population size class to be made. The survey methods used depended on the different characteristics of each pond (such as turbidity, or abundance of aquatic vegetation), following Natural England’s 'Great Crested Newt Mitigation Guidelines' (Ref. 1.5).

1.3.6 The three standard survey methods (torchlight survey, bottle-trapping and egg search) were carried out on each visit to the ponds although, in some cases, fewer survey techniques (the most appropriate to the pond) could be used. Netting was used as a last resort on a single individual pond, and only once all other options had proved ineffective.

1.3.7 Each torchlight survey comprised a single walk around the pond at a measured pace, using a 500,000 candle-power torch to locate and identify amphibians. During the survey, all amphibians observed were counted, sexed and identified to species where possible (female smooth (*Lissotriton vulgaris*) and palmate (*L. helveticus*) newts are not always distinguishable by torch surveys). Survey timings and weather conditions were also recorded.

1.3.8 Bottle-trapping surveys used ridged 1.5 litre mineral water bottles (with the top end cut off and inverted inside the main body of the bottle). These were submerged in the pond on canes wedged into the pond sediment. Traps were set in the evening and checked early the following morning. All amphibians captured overnight were identified to species and life stage, and sexed where possible. Suitable aquatic vegetation at the pond margins was also checked for the presence/absence of newt eggs.

1.3.9 For ponds found to contain great crested newts, populations were classified as 'small' for maximum counts up to ten, 'medium' for maximum counts between 11 and 100, and 'large' for maximum counts over 100 (Ref. 1.5).

1.3.10 Appropriate biosecurity measures were adopted whilst undertaking the surveys, to avoid the inadvertent spreading of chytridiomycosis. This is a fungal disease which can have a devastating effect on amphibian populations. Measures implemented included the thorough drying of traps between surveys, and the application of Virkon antiseptic solution to survey equipment, wading poles and surveyor's waders between visits, where ponds are separated by a distance of over 1km.

1.3.11 The water bodies occasionally exhibited conditions rendering certain survey methods impractical or unsafe. For example, a pond with heavy duckweed cover may not be effectively torched, and certain ponds had banks too steep to safely allow the deployment of bottle traps. For this reason, although effort was made to use three survey methods for each pond, occasionally this was not possible. Occasionally bank vegetation and conditions restricted access to sections of the water body, rendering surveying the entire perimeter of a pond impossible. In the event of accidental trapping of water shrew (*Neomys fodiens*), no further bottle trapping surveys were undertaken.

b) Results

1.3.12 Nine water bodies were identified within 500m of the site, see **Table 1.7**.

Table 1.7: Wickham Market ponds identified by Arcadis in 2015

Pond ID	Amec ID	Scoped In/out		Access	Surveyed
		In	Out		
59	WB51a		Yes - Dry	Yes	No
60	WB51	Yes		Yes	Yes
61	WB50	Yes		Yes	Yes
62		Yes		No	No
63		Yes		No	No
64			Yes - Dry	Yes	No
65		Yes		No	No
66			Yes – South of A12	-	No
6		Yes		No	No

1.3.13 **Figure 7.3** (**Annex 7A.1**) shows the locations of ponds which were classified as follows: ponds which were scoped out as requiring further surveys (e.g. because of location, no longer extant or dry at the time of survey), ponds where access was not granted for scoping or survey, ponds where access was granted for scoping but not for subsequent surveying, ponds where great crested newt surveys were carried out, and ponds that were found to contain great crested newt populations.

1.3.14 Access was not granted to Ponds 62, 63, 65 and 67 for either a scoping visit or subsequent survey. A further pond (Pond 66) was scoped out as it was east of the A12 trunk road and the busy B1078 slip roads onto the A12. These roads act as a barrier to the dispersal of great crested newts; in addition, the habitat between Pond 66 and the site boundary is unsuitable for newts comprising an intensive arable field, with more optimal newt habitat including scrub found to the south of Pond 66. Therefore, any newts using Pond 66 would be unlikely to access the site. Of the remaining four ponds (Ponds 59, 60, 61 and 64), Ponds 59 and 64 were both found to be dry upon visiting, and so were scoped out of future survey work. The remaining two ponds (Ponds 60 and 61) were both found to have potential for supporting great crested newts.

1.3.15 **Table 1.8** presents the results of the Habitat Suitability Index assessment carried out for each pond. Ponds 60 and 61 were adjacent to each other. Both ponds were scored as 'Below Average' suitability for great crested newts. Factors limiting the suitability of these ponds were poor water quality, excessive shading and heavy algal cover.

Table 1.8: Habitat Suitability Index for ponds surveyed by Arcadis in 2014

Feature	Pond ID	
	60	61
Location	1	1
Pond area	0.45	1
Pond drying	0.9	0.9
Water quality	0.33	0.33
Shade	0.3	0.3
Fowl	0.67	0.67
Fish	1	0.67
Ponds	0.65	0.65
Terrestrial habitat	0.67	0.67
Macrophytes	0.3	0.3
Habitat Suitability Index Score	0.57	0.59
Suitability for Great Crested Newt	Below average	Below average

1.3.16 **Table 1.9** gives full pond descriptions of all the ponds scoped and surveyed in 2014. **Table 1.10** gives full survey results for the ponds surveyed in 2014. No great crested newts were found in either Pond 60 or 61.

Table 1.9: Pond descriptions for ponds surveyed by Arcadis in 2014

Pond 60	
	
Grid reference	TM315575
Description	Pond 60 comprises two water bodies which are likely to be connected during the winter. Situated within a small copse, bounded by arable fields. Heavily shaded and devoid of emergent and marginal aquatic vegetation, although developed a heavy algal cover through the summer. Occasionally visited by water fowl, indicated by visible droppings along the banks. Good foraging and hibernacula opportunities within the copse, and connectivity via grass strips to other nearby areas of woodland. Located within three metres of Pond 61.
Area	250m^2
Depth	1.0m
Perimeter	88m
Scoped in/out	In

Pond 61	
	
Grid reference	TM314575
Description	A large pond situated immediately adjacent to Pond 60, and situated within a small area of broad-leaved woodland with arable fields bordering to the east and west. Quite heavily shaded with very little emergent or marginal aquatic vegetation. The pond had heavy algal growth during the summer. Water fowl occasionally visit the pond, and there is minor fish presence. There are good foraging and hibernacula opportunities for great crested newts within the copse, and good connectivity via grass verges to other areas of woodland.
Area	550m^2
Depth	2.0m
Perimeter	145m
Scoped in/out	TM314575

Table 1.10: Amphibian survey results for ponds surveyed by Arcadis in 2014

Key to tables:
Wind speed: (1 = no wind; 2 = light wind; 3 = strong wind)
Rain: (heavy/light/none)
Turbidity score (0-5): (0 = completely clear, 5 = very turbid)
Vegetation cover score (0-5): (0 = no vegetation obscuring water, 5 = water completely obscured by vegetation)

Pond 60								
Visit 1	14/04/14							
Temperature:	6ºC			*Rain*		None		
Wind speed	Light			*Cloud cover*		None		
Turbidity score	0			*Vegetation cover*		1		
Survey constraints	Steep banks, heavy vegetation cover on banks							
% of perimeter surveyed	100%			*Other amphibians*		None		
Species	*Egg search*	*Torchlight survey*						
		Larvae	Eft	Immature	Adult			**Total**
					Male	Female	Unknown	
Great crested newt	None							**0**
Smooth newt	None				1	1		**2**
Palmate newt								**0**
Smooth/palmate newt								**0**
Species		*Trap*						
		Larvae	Eft	Immature	Adult			**Total**
					Male	Female	Unknown	
Great crested newt								**0**
Smooth newt								**0**
Palmate newt								**0**
Smooth/palmate newt								**0**

Pond 60								
Visit 2	28/04/14							
Temperature:	12ºC			*Rain*	None			
Wind speed	No wind			*Cloud cover*	Overcast			
Turbidity score	4			*Vegetation cover*	4			
Survey constraints	None							
% of perimeter surveyed	100%			*Other amphibians*	Common frog			
Species	*Egg search*	*Torchlight survey*						
		Larvae	Eft	Immature	Adult			**Total**
					Male	Female	Unknown	
Great crested newt	None							**0**
Smooth newt	None							**0**
Palmate newt								**0**
Smooth/palmate newt						1		**1**
Species	*Egg search*	*Trap*						
		Larvae	Eft	Immature	Adult			**Total**
					Male	Female	Unknown	
Great crested newt	None							**0**
Smooth newt	None							**0**
Palmate newt								**0**
Smooth/palmate newt								**0**

Pond 60								
Visit 3	12/05/14							
Temperature:	9ºC			*Rain*		None		
Wind speed	Light			*Cloud cover*		Overcast		
Turbidity score	0			*Vegetation cover*		0		
Survey constraints	None							
% of perimeter surveyed	100%			*Other amphibians*		None		
Species	*Egg search*	*Torchlight survey*						
		Larvae	Eft	Immature	Adult			**Total**
					Male	Female	Unknown	
Great crested newt	None							**0**
Smooth newt	None							**0**
Palmate newt								**0**
Smooth/palmate newt								**0**
Species		*Trap*						
		Larvae	Eft	Immature	Adult			**Total**
					Male	Female	Unknown	
Great crested newt								**0**
Smooth newt								**0**
Palmate newt								**0**
Smooth/palmate newt								**0**

Pond 60								
Visit 4	15/05/14							
Temperature:	10ºC			*Rain*		None		
Wind speed	No wind			*Cloud cover*		None		
Turbidity score	4			*Vegetation cover*		1		
Survey constraints	None							
% of perimeter surveyed	80%			*Other amphibians*		None		
Species	*Egg search*	*Torchlight survey*						
		Larvae	Eft	Immature	Adult			**Total**
					Male	Female	Unknown	
Great crested newt	None							**0**
Smooth newt	None							**0**
Palmate newt								**0**
Smooth/palmate newt								**0**
Species		*Trap*						
		Larvae	Eft	Immature	Adult			**Total**
					Male	Female	Unknown	
Great crested newt								**0**
Smooth newt								**0**
Palmate newt								**0**
Smooth/palmate newt								**0**

Pond 61								
Visit 1	14/04/14							
Temperature:	5ºC			*Rain*		None		
Wind speed	No wind			*Cloud cover*		None		
Turbidity score	4			*Vegetation cover*		4		
Survey constraints	Heavy algal cover, silt and deep water rendered torching difficult, western bank could not be accessed.							
% of perimeter surveyed	60%			*Other amphibians*		None		
Species	*Egg search*	*Torchlight survey*						
		Larvae	Eft	Immature	Adult			**Total**
					Male	Female	Unknown	
Great crested newt	None							**0**
Smooth newt	None							**0**
Palmate newt								**0**
Smooth/palmate newt								**0**
Species		*Trap*						
		Larvae	Eft	Immature	Adult			**Total**
					Male	Female	Unknown	
Great crested newt								**0**
Smooth newt								**0**
Palmate newt								**0**
Smooth/palmate newt								**0**

Pond 61								
Visit 2	28/04/14							
Temperature:	12ºC			*Rain*		None		
Wind speed	Light			*Cloud cover*		Overcast		
Turbidity score	3			*Vegetation cover*		1		
Survey constraints	Torching difficult – turbid water when deep							
% of perimeter surveyed	60%			*Other amphibians*		None		
Species	*Egg search*	*Torchlight survey*						
		Larvae	Eft	Immature	Adult			**Total**
					Male	Female	Unknown	
Great crested newt	None							**0**
Smooth newt	None							**0**
Palmate newt								**0**
Smooth/palmate newt								**0**
Species		*Trap*						
		Larvae	Eft	Immature	Adult			**Total**
					Male	Female	Unknown	
Great crested newt								**0**
Smooth newt								**0**
Palmate newt								**0**
Smooth/palmate newt								**0**

Pond 61								
Visit 3	12/05/14							
Temperature:	9ºC			*Rain*		None		
Wind speed	Light			*Cloud cover*		Overcast		
Turbidity score	4			*Vegetation cover*		0		
Survey constraints	Torching difficult – turbid water when deep							
% of perimeter surveyed	60%			*Other amphibians*		None		
Species	*Egg search*	*Torchlight survey*						
		Larvae	Eft	Immature	Adult			**Total**
					Male	Female	Unknown	
Great crested newt	None							**0**
Smooth newt	None							**0**
Palmate newt								**0**
Smooth/palmate newt								**0**
Species		*Trap*						
		Larvae	Eft	Immature	Adult			**Total**
					Male	Female	Unknown	
Great crested newt								**0**
Smooth newt								**0**
Palmate newt								**0**
Smooth/palmate newt								**0**

Pond 61								
Visit 4	15/05/14							
Temperature:	10ºC			*Rain*		None		
Wind speed	No wind			*Cloud cover*		None		
Turbidity score	4			*Vegetation cover*		1		
Survey constraints	None							
% of perimeter surveyed	60%			*Other amphibians*		Common frog		
Species	*Egg search*	*Torchlight survey*						
		Larvae	Eft	Immature	Adult			**Total**
					Male	Female	Unknown	
Great crested newt	None							**0**
Smooth newt	None							**0**
Palmate newt								**0**
Smooth/palmate newt								**0**
Species		*Trap*						
		Larvae	Eft	Immature	Adult			**Total**
					Male	Female	Unknown	
Great crested newt								**0**
Smooth newt								**0**
Palmate newt								**0**
Smooth/palmate newt								**0**

1.4 Ornithology

a) Methodology

1.4.1 During the extended Phase 1 habitat and protected species walkover survey, the value of the site for breeding birds was assessed. The habitats present were considered to provide suitable habitat for both breeding and wintering bird species; in particular, bird species characteristic of farmland habitats.

1.4.2 Bird surveys were undertaken monthly during the breeding season between April and June 2014 (inclusive), and for the wintering season monthly between November 2014 and March 2015 (inclusive). The surveys aimed to identify any important breeding/wintering birds of nature conservation interest within the site and its surroundings.

1.4.3 In accordance with best practice survey guidance (Ref. 1.6), a series of transect-based surveys was carried out. The same methodology (detailed below) was used for both the breeding and wintering bird surveys.

1.4.4 The surveys extended along field boundaries, tractor-tracks, woodland edges and woodland tracks within the site boundary (where land access was permitted). Focus was placed upon species of nature conservation importance (Schedule 1 species of the Wildlife and Countryside Act (Ref. 1.7), Red and Amber List species of Birds of Conservation Concern (BoCC) (Ref. 1.8) and National Environment and Rural Communities (NERC) Act (Ref. 1.9) listed species), with these species being mapped and recorded using standard British Trust for Ornithology (BTO) species and behaviour codes. All other species (Green List species on BoCC) were recorded and an inventory was produced, but these records were not mapped.

1.4.5 The surveys were timed to take place during the morning, commencing approximately one hour after sunrise, with each transect lasting for approximately two hours. The surveys were timed to avoid poor weather conditions (i.e. heavy rain, mist/fog and strong winds), wherever possible. Further details regarding the timing and frequency of transect surveys, as well as the associated weather conditions, are presented below.

b) Survey timings and weather conditions

1.4.6 **Table 1.11** and **Table 1.12** provide the survey timing and weather conditions for the breeding bird and wintering bird surveys respectively.

Table 1.11: Breeding bird survey visits timings and weather conditions

Date	Start	Finish	Duration of Survey (Hours)	Weather	Wind speed (beaufort)	Wind direction	Cloud cover (oktas)
15/04/2014	6:00	8:30	2:30	Fine	2	South	0
02/05/2014	7:00	8:00	1	Overcast, cold	4	North	8
03/06/2014	5:30	8:00	2:30	Overcast, sunny towards end.	0	n/a	5-8

Table 1.12: Wintering bird survey visits timings and weather conditions

Date	Start	Finish	Duration of Survey (Hours)	Weather	Wind speed (beaufort)	Wind direction	Cloud cover (oktas)
27/11/2014	08:40	10:00	1.5	Overcast	1	E	8/8
18/12/2014	9:55	11:30	1hr 35mins	Overcast	4	E	7/8
22/01/2015	8:00	9:40	1hr 40mins	Overcast	1-2	E	8/8
17/02/2015	8:00	9:30	1hr30mins	Sunny	4	W	1-4/8
16/03/2015	14:40	15:30	50mins	Sunny	1-3	E	4/8

c) Results

1.4.7 The results of both the breeding bird survey and the wintering bird surveys are detailed in **Table 1.13**.

Table 1.13: All bird species recorded, and peak counts recorded during the breeding and wintering bird surveys

Species	Schedule 1	Conservation status (BoCC)	NERC listed	Present in breeding season	Breeding season peak count	Present in wintering season	Wintering season peak count
Fieldfare	✓	Red List	✓			✓	1
Redwing	✓	Red List	✓			✓	31
Grey partridge		Red List	✓			✓	3
Herring gull		Red List	✓			✓	30
Lapwing		Red List	✓	✓	1		
Linnet		Red List	✓	✓	2	✓	1
Mistle thrush		Red List				✓	1
Skylark		Red List	✓	✓	11	✓	56
Song thrush		Red List	✓	✓	1	✓	18
Yellowhammer		Red List	✓	✓	4	✓	11
Bullfinch		Amber List	✓			✓	2
Dunnock		Amber List	✓	✓	6	✓	9
Black-headed gull		Amber List				✓	43
Greylag goose		Amber List				✓	1
Kestrel		Amber List				✓	1
Lesser black-backed gull		Amber List		✓	9		
Mallard		Amber List				✓	65

Species	Schedule 1	Conservation status (BoCC)	NERC listed	Present in breeding season	Breeding season peak count	Present in wintering season	Wintering season peak count
Meadow pipit		Amber List		✓	2	✓	8
Snipe		Amber List				✓	42
Stock dove		Amber List		✓	2	✓	27
Blackbird		Green List		✓	3	✓	18
Blackcap		Green List		✓	7		
Blue tit		Green List		✓	41	✓	33
Buzzard		Green List				✓	2
Carrion crow		Green List		✓	6	✓	31
Chaffinch		Green List		✓	10	✓	58
Chiffchaff		Green List		✓	2		
Goldfinch		Green List				✓	35
Great tit		Green List		✓	7	✓	26
Great spotted woodpecker		Green List				✓	1
Greenfinch		Green List				✓	3
Green woodpecker		Green List		✓	1		
Jackdaw		Green List				✓	1
Long-tailed tit		Green List		✓	2	✓	8
Magpie		Green List				✓	4
Moorhen		Green List				✓	1

Species	Schedule 1	Conservation status (BoCC)	NERC listed	Present in breeding season	Breeding season peak count	Present in wintering season	Wintering season peak count
Pheasant		Not listed		✓	2	✓	17
Pied wagtail		Green List				✓	1
Red-legged partridge		Not listed		✓	2	✓	8
Woodpigeon		Green List		✓	23	✓	90
Wren		Green List		✓	4	✓	7
Chiffchaff		Green List		✓	2		
Goldfinch		Green List				✓	35
Great tit		Green List		✓	7	✓	26
Great spotted woodpecker		Green List				✓	1
Greenfinch		Green List				✓	3
Green woodpecker		Green List		✓	1		
Jackdaw		Green List				✓	1
Long-tailed tit		Green List		✓	2	✓	8
Magpie		Green List				✓	4
Moorhen		Green List				✓	1
Pheasant		Not listed		✓	2	✓	17
Pied wagtail		Green List				✓	1
Red-legged partridge		Green List		✓	2	✓	8
Woodpigeon		Green List		✓	23	✓	90

Species	Schedule 1	Conservation status (BoCC)	NERC listed	Present in breeding season	Breeding season peak count	Present in wintering season	Wintering season peak count
Whitethroat		Green list		✓	6		
Wren		Green List		✓	4	✓	7

1.5 Bats

a) Methodology

1.5.1 During the 2014 extended Phase 1 habitat and protected species walkover survey, an external inspection of all trees on site was carried out to assess their suitability for occupancy by roosting and/or hibernating bats. Potential roost features were observed from the ground with binoculars and scrutinised for their suitability to be used by bats, alongside searching for any evidence of use, such as staining, feeding remains or droppings. The likely value of the various habitat features for foraging and commuting bats was also critically assessed.

1.5.2 A further detailed inspection of trees present within the site boundary and the adjacent woodland blocks was undertaken on 29 April 2015 to identify the presence of potential roost features. Inspections were undertaken from the ground using binoculars to identify the presence of potential roost features as well as identifying any evidence of use.

1.5.3 Two activity transects were undertaken at the site. One was located within the site boundary (Transect 2) and a second undertaken on adjoining land to the west (Transect 1). The location of transect routes at the site are illustrated on **Figure 7.8 (Annex 7A.1).**

1.5.4 Activity transect surveys were undertaken across the Site and the adjacent arable land monthly between May and October 2014. Each transect was undertaken simultaneously by two surveyors using Pettersson D240x time-expansion bat detectors, one listening at 35kHz and one at 50kHz thereby ensuring that bat species echolocating at low frequencies were not missed. Each transect was undertaken from dusk for one and a half to two hours after sunset except for the surveys undertaken in October 2014 which were undertaken from two hours before sunrise until sunrise. The transect routes undertaken are illustrated on **Figure 7.8** in **Annex 7A.1**. Data collected during activity transects was analysed in BatSound by experienced analysts, and a measure of relative bat activity in the form of the number of bat passes per hour (B/h)[2] calculated.

1.5.5 Four static detectors (Wildlife Acoustic Song Meter SM2BAT+), making full spectrum recordings, were deployed within areas of suitable habitat

[2] A measure of relative bat activity has been calculated in the form of the number of bat passes per hour. This measure has been calculated to reflect both the total number of calls experienced over a complete transect for all bat species on each survey visit, and the total number of calls by a given species over a complete transect for all survey visits undertaken in 2014, combined. It is important to note that not all areas of the transect are recorded throughout; that calculations have been based on survey effort rounded to the nearest quarter of an hour and that the passes per hour value has been provided to the nearest tenth. As such this measure of relative bat activity is an approximation.

(hereafter referred to as monitoring stations (MSs)). The location of these MSs are illustrated on **Figure 7.8** in **Annex 7A.1**. Static detectors were deployed on five occasions, monthly between June and October 2014 (see **Table 1.14** for details of survey periods). On each occasion, static detectors were deployed for a period of seven consecutive nights and were set to record between 20 minutes before sunset until 20 minutes after sunrise.

Table 1.14: Static detector survey periods

Survey visit	Survey Dates
1	9 June – 16 June
2	8 July – 16 July
3	27 August – 3 September
4	25 September – 30 September
5	1 October – 7 October

1.5.6 Data collected during static detector surveys was analysed using SonoChiro auto-identification software and the results grouped into six species groups (barbastelle; 'big bat'[3] spp., *Plecotus* spp. (assumed to be brown long-eared bat[4]), *Pipistrellus* spp[5]., *Myotis* spp., and Nathusius' pipistrelle) and the mean number of passes per night (mppn) calculated for further analysis.

1.5.7 Full details of the analysis process, as well as the trials undertaken to determine the suitability of SonoChiro as an analysis method and the manual verifications undertaken are provided in Arcadis (2016) (Ref. 1.10).

b) Results

i. Extended Phase 1 habitat protected species walkover survey

1.5.8 A single tree, a mature oak (Target Note 8) with features suitable for roosting bats, was identified within the site during the extended Phase 1 habitat survey/protected species walkover. Three woodland blocks (Target Note 1, Target Note 5 and Target Note 9) were identified directly adjacent to the Red line boundary, two of which (Target Note 5 and Target Note 9) were considered to contain trees with the potential to support roosting bats. A further woodland block (Target Note 10), approximately 300m to the west of the site boundary was also considered to have trees with the potential to

[3] The 'big bat' species group includes calls identified specifically to noctule or serotine as well as those identified to the 'big bat' group (noctule, Leisler's bat, and serotine).

4 All long-eared bat recordings are considered to relate to brown long-eared bat echolocation calls due to the absence of grey long-eared bat from Suffolk based on their current known distribution (Ref. 1.11)

[5] The *Pipistrellus* spp. group includes calls identified specifically to common or soprano pipistrelle as well as those identified to the common/soprano pipistrelle group. This group excludes calls identified as Nathusius' pipistrelle.

support roosting bats. The tree- and scrub-lined access track running along the western edge of the site boundary as far as Whin Belt was considered to offer good quality foraging and commuting habitat for bats. Target notes associated with these features (Target Note 1, Target Note 5, Target Note 8, Target Note 9 and Target Note 10) are detailed in **Table 1.5**.

ii. Activity transect surveys

1.5.9 At least seven species were recorded across both transects. Activity levels were noticeably more varied across survey visits on Transect 1 with a peak of 28B/h recorded in June 2014 and a low of 2B/h recorded in October 2014. In comparison, activity levels across Transect 2, with the exception of October 2014, were largely consistent between 6 and 10B/h. No passes were recorded across Transect 2 in October 2014. Results of surveys on Transects 1 and 2 are detailed, by species/species group, in **Table 1.9** and **Table 1.10**.

1.5.10 Common and soprano pipistrelles, and calls assigned to the *Pipistrellus* spp. group were found to be the most frequently encountered species across both transects. Common pipistrelles were recorded during all survey visits except for October 2014. Activity was recorded across both transects with groupings of passes noted along the access track, the woodland block at the northern extent of the access track and around Whin Belt, as illustrated on **Figure 7.9** in **Annex 7A.1**. Activity transect surveys suggest that this activity is most likely to have been generated by a small number of individuals making multiple passes (nine passes recorded within the site during any-one transect visit). In contrast, other species were recorded at very low levels of activity, with only five occasions in which static detectors recorded activity levels greater than 5mppn, including barbastelle on two occasions (8 and 10mppn on two static detectors during late August and early September).

1.5.11 Soprano pipistrelles were recorded during all survey visits, although were only recorded on Transect 1 during the October 2014 survey. As noted with common pipistrelle, passes were recorded across both transects and groupings of passes were noted along the access track, as illustrated on **Figure 7.10** in **Annex 7A.1**.

1.5.12 Only low levels of activity were recorded for remaining species. 'Big bat' passes comprised noctule or *Nyctalus* spp. with no serotine passes recorded. While only low levels of activity were recorded, these species were more frequently encountered on Transect 1. 'Big bat' passes were recorded during all survey visits except for October 2014. A single noctule pass was recorded eight minutes after sunset in July 2014 (suggesting nearby emergence) with a further noctule and *Nyctalus* spp. pass recorded in the hour after sunset in September and May 2014 respectively. Activity was scattered across the transects with no clearly discernible areas of higher activity.

1.5.13 Low numbers of *Myotis* spp. passes were also recorded across both transects, with all passes recorded in August and September 2014. Two passes were recorded in the hour following sunset.

1.5.14 Barbastelle were recorded on only three occasions, all occurring during the September visit. All recorded passes occurred more than an hour after sunset and were scattered across the Transects.

1.5.15 Two Nathusius' pipistrelle passes, both recorded in June 2014, were recorded. Both passes occurred more than an hour after sunset. A single brown long-eared bat pass was recorded more than an hour after sunset, in September. It is considered likely that brown long-eared bat passes were under-recorded due to the quiet nature of their echolocation calls.

Table 1.15: Summary of activity transect results from Transect 1

Species	Number of passes recorded and survey effort (hours)						Total	Bat passes per hour (B/h)**
	19.05.14 (2.25)	16.06.14 (2)	07.07.14 (2.25)	06.08.14 (2)	09.09.14 (1.75)	07.10.14 (1.50)		
Common pipistrelle	10	33	12	15	6	0	**76**	**6.5**
Soprano pipistrelle	2	16	3	9	1	3	**34**	**2.9**
Pipistrellus spp.	3	4	2	0	0	0	**9**	**0.8**
Noctule	0	2	3	2	0	0	**7**	**0.6**
Myotis spp.	0	0	0	1	4	0	**5**	**0.4**
Nyctalus spp.	0	0	0	3	0	0	**3**	**0.3**
Barbastelle	0	0	0	0	1	0	**1**	**0.1**
Big bat spp.	1	0	0	0	0	0	**1**	**0.1**
Brown long-eared bat*	0	0	0	0	1	0	**1**	**0.1**
Nathusius' pipistrelle	0	1	0	0	0	0	**1**	**0.1**
Total	**16**	**56**	**20**	**30**	**13**	**3**	**138**	
Bat passes per hour (B/h)	**7.1**	**28**	**8.8**	**15**	**7.4**	**2**		

*All long-eared bat recordings are considered to relate to brown long-eared bat echolocation calls due to the absence of grey long-eared bat from Suffolk based on their current known distribution. (Ref. 1.11, Ref. 1.12)

** This calculation of B/h has been calculated across survey visits and points along the Transect which may have experienced differences in a range of factors including weather conditions. As such this provides only a broad indication of the level of bat activity.

Table 1.16: Summary of activity transect results from Transect 2

Species	Number of passes recorded and survey effort (hours)						Total	Bat passes per hour (B/h)
	19.05.14 (2.25)	16.06.14 (2)	07.07.14 (2)	06.08.14 (2)	09.09.14 (1.75)	07.10.14 (1.50)		
Pipistrellus spp.	6	2	3	1	1	0	**13**	**11.3**
Common pipistrelle	4	3	8	9	9	0	**33**	**2.9**
Soprano pipistrelle	3	6	8	9	2	0	**28**	**2.4**
Barbastelle	0	0	0	0	2	0	**2**	**0.2**
Myotis spp.	0	0	0	1	1	0	**2**	**0.2**
Noctule	0	0	1	0	1	0	**2**	**0.2**
Nyctalus spp.	1	0	0	0	0	0	**1**	**0.1**
Nathusius pipistrelle	0	1	0	0	0	0	**1**	**0.1**
Total	**14**	**12**	**20**	**20**	**16**	**0**	**82**	
Bat passes per hour (B/h)	**6.2**	**6**	**10**	**10**	**9.1**	**0**		

iii. Static detector surveys

1.5.16 Full details of the results of static detector surveys in the form of the mean number of passes per night (mppn) across the site are provided in **Table 1.17**. Recorded data has been grouped into six species groups (barbastelle, *Myotis* spp., 'big bat' spp., long-eared bat spp., pipistrelle spp., and Nathusius pipistrelle).

1.5.17 Peak activity levels across all survey occasions for each species group are indicated in green.

iv. Tree assessment survey

1.5.18 Full details of the features identified during the tree assessment survey are provided in **Table 1.18**. Location of all trees is shown on **Figure 7.7** in **Annex 7A.1**.

Table 1.17: Summary of static detector survey results

Survey dates	Monitoring location	Mean passes per night					
		Barbastelle	*Myotis* spp.*	Big Bat spp.**	Nathusius' pipistrelle ***	Pipistrelle spp.****	Long-eared bat spp. *****
09.06.14 – 16.06.14	1	1.57	6.29	1.71	0.29	109.14	0.43
	2	0.43	1.14	0.71	0.43	330.43	0.00
	3	1.14	2.57	5.14	1.29	274.29	0.14
	4	0.00	1.29	1.71	0.29	82.71	0.14
08.07.14 – 16.07.14	1	1.25	1.25	0.25	0.13	120.00	0.00
	2	0.00	0.25	4.63	0.00	310.00	0.00
	3	4.13	1.38	4.38	0.00	137.75	0.00
	4	0.00	0.50	1.38	1.50	118.38	0.25
27.08.14 – 03.09.14	1	7.50	3.00	0.67	0.00	166.50	0.83
	2	10.17	2.50	0.17	0.00	788.50	0.33
	3	2.67	5.17	0.83	0.00	194.67	0.67
	4	0.50	2.17	0.17	0.00	462.83	0.33
25.09.14 – 30.09.14	1	4.33	3.50	1.33	0.17	114.83	1.00
	2	2.33	2.17	0.83	0.00	402.83	0.00
	3	2.50	2.33	1.83	0.00	16.83	0.33
	4	0.83	2.50	0.67	0.00	35.50	1.17

Survey dates	Monitoring location	Mean passes per night					
		Barbastelle	*Myotis* spp.*	Big Bat spp.**	Nathusius' pipistrelle ***	Pipistrelle spp.****	Long-eared bat spp. *****
01.10.14 – 07.10.14	1	4.17	1.50	0.17	0.00	58.17	0.17
	2	0.17	1.33	0.33	0.00	132.00	0.00
	3	0.50	1.00	0.17	0.17	6.17	0.17
	4	0.67	2.33	0.67	0.17	39.83	0.33

* *Myotis* spp. includes those calls identified by SonoChiro specifically as Natterer's and Bechstein's in addition to those identified to a group level as *Myotis* spp..

** Big Bat spp. includes those calls identified by SonoChiro specifically as noctule, serotine and northern bat in addition to those identified to a group level as *Eptesicus/Nyctalus*.

*** Nathusius' pipistrelle includes those calls identified by SonoChiro specifically as Nathusius' pipistrelle in addition to those identified as Nathusius'/Kuhl's/Savi's pipistrelle and those as Kuhl's pipistrelle but which manual checks showed to be Nathusius' pipistrelle.'

**** Pipistrelle spp. includes those calls identified by SonoChiro specifically as common and soprano pipistrelles in addition to those identified to these at a group level.

***** Long-eared bats include those calls identified by SonoChiro specifically as brown or grey long-eared bats in addition to those identified to a group level as long-eared bats.

Table 1.18: Summary of bat tree assessment results

Tree Number	Grid Reference	Tree Species and general tree description	Description of Feature	Potential of Feature
1	TM 31565 57107	Early Mature Pedunculate Oak Trunk 1050mm diameter	Old pruning wound from crown lifting on north side of main stem at 2.5m. Partially occluded wound 80mm wide by 180mm high extending a small distance (50mm) up and behind occlusion. Remnants of old 'mouse nest' (old leaves) in void, three droppings found adhering to face of dead wood inside.	High
			Split running along top of primary limb (350mm diameter) with dead wood, a complex cavity and delaminated wood on north-west site of stem at 4m with split extending about 1.5m Fungal fruiting body at end.	High
			Additional split and dead wood on limb at 4m approximately 2 to 6m out from trunk. Delaminated bark and dead wood along top edge of limb with extensive small splits (largely too tight) and hazard beam splits at the end of branch which could extend further.	High
			Hole wound facing south in dead spur on primary limb at 2m on west side of tree.	High
			Several small holes in small snapped off limbs at end of branch.	Medium/Low
			Two rot holes in pruning wounds (40x50mm diameter) on northern side of primary stem at 9 and 10m potentially extending into limb, facing west.	High
			Tear off feature on branch at 8m potentially extending horizontally into limb.	Medium
			Rot hole in pruning wound (35mm diameter) on east side of main stem facing trunk at 6m.	Medium
2	TM 31553 57146	Early Mature Blackthorn	Two holes formed in pruning wounds at 2.5m on northern side of north stem (one 50mm diameter, one at 50x100mm diameter). Both holes extend downwards only into single shared cavity approx. 120-150mm diameter and 400mm deep.	Low

Tree Number	Grid Reference	Tree Species and general tree description	Description of Feature	Potential of Feature
		Twin stem at 0m in 250mm diameter trunk within dense/cluttered canopy of blackthorn.	Bird's nest at base of hole, no evidence of bats. Inspected with endoscope.	
3	TM 31544 57150	Standing dead Oak 1100mm diameter trunk. Elsewhere largely obscured by icy, much of crown reduced, extensive cracks in visible dead wood.	Large partially occluded wound (approx. 400mm) with thick 'rams-horning' on north-east side of main stem from 0m to 4m+. Stem totally obscured by ivy above this point. Cavity approx. 15-20mm deep and 150-200mm wide behind bark on right hand side of wound extends up 900mm and clear inside.	High
4	TM 31546 57179	Early Mature Pedunculate Oak 1000mm diameter trunk	Covered in dense ivy with thick stems forming large covered cavities across tree above 2m up to canopy. Inspected with endoscope from floor – suitable and extensive features identified.	High
			Area of ruptured bark at 3.5m (800x100mm). Cavity extends up from rupture between main stem and bark up 900mm+.	High
5	TM 31530 57197	Semi-Mature Field Maple Twin stem at 15m.	Cavity in pruning wound in south stem (stem diameter 180mm). Cavity entrance 25mm wide by 80mm high extending up into stem. Inspected with endoscope but curve in cavity restricted full inspection. Bird feathers at base of cavity. Dense blackthorn foliage in front of cavity.	High
6	TM 31617 57238	Semi-Mature Ash (*Fraxinus spp*.)	Primary limb (120mm diameter) at 10m high south facing with two holes at 10m (25mm x 100mm rot hole in pruning wound) and 11m (20mm diameter rot hole in pruning wound). Both potentially extend into cavities in limb, may extend up or down.	Medium

Tree Number	Grid Reference	Tree Species and general tree description	Description of Feature	Potential of Feature
		Twin stemmed at 0m in 350mm diameter truck	Pruning wound (20mm x 80mm) on underside of smaller limb (100mm diameter) on western site, and unlikely to extend into cavity (branch green/young).	Low
7	TM 31573 57258	Mature Pedunculate Oak 1100mm diameter main stem multi-stemmed at 7.5m Minor deadwood throughout crown mostly obscured by ivy	Small hole in pruning wound on underside of primary limb (1200mm diameter) at 2.5m on east side. Hole 10x30mm widening to a 40x60mm clean cavity above.	High
			Large tear off wound on west side of central canopy at 4m to 6m; significant splits, cracks and fissures leading to potentially significant cavities behind although very congested with ivy.	Medium
8	TM 31547 57261	Semi-Mature Ash 320mm diameter main stem, twin stemmed at 5m	Damage wounds from 0 – 1.75m; partially occluded wound between 200-250mm wide, two holes lead into spire like cavity 900 and 1100mm above ground either side of central deadwood. Entrances (20x50mm and 40x40mm) lead into single cavity behind deadwood plate internally up to 130mm wide and extends 1m+ up stem. Inspected with endoscope – no signs of current occupation by bats.	High
9	TM 31554 57240	Mature Pedunculate Oak 950mm diameter main stem multi-stemmed at 6m.	Minor deadwood in upper crown with some loose wood and small splits at ends of limbs.	Low
			40mm diameter hole in partially occluded pruning wound at 3m on eastern side of main stem extending into cavity 70mm deep x 60mm wide. Bird droppings present and no signs of current occupation by bats.	High
10	TM 31564 57247	Mature Pedunculate Oak 800mm diameter single stem with significant crown dieback and deadwood in upper canopy	Significant amounts of dead/delaminated bark at 8-10m (large/thick plates) with cavities behind.	High
			Several tear off wounds, partially occluded. Partially occluded wound at base of small primary stem at 4m on northern side. Cavity 100x120mm, fairly open and shallow.	Low

Tree Number	Grid Reference	Tree Species and general tree description	Description of Feature	Potential of Feature
11	TM 314 573	Pheasant rearing covert. Semi-mature trees in wood primarily Ash and Oak	Some potentially suitable features seen from distance, including rot holes in pruning wounds, tear off wounds and dead wood.	Undetermined*
12	TM 319 577	Young plantation mixed broadleaf woodland	Viewed from distance; unlikely to support any potentially suitable roost features.	Low
13	TM 314 575	Mixed broadleaf woodland including Oak, Ash, Blackthorn, Scots Pine, Elder and Sycamore primarily semi-mature	Several large mature trees with potentially roosting bat features including deadwood, tear off wounds and pruning wounds.	Undetermined*

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VOLUME 4, CHAPTER 7, APPENDIX 7A:

ANNEX 7A.5 - NON-LICENSABLE METHOD STATEMENTS:

- ANNEX 7A.5A - BATS
- ANNEX 7A.5B - REPTILES

VOLUME 4, CHAPTER 7, APPENDIX 7A.5A: BAT METHOD STATEMENT

Contents

Tables

None provided.

Plates

Figures

None provided.

Appendices

1 Bats Non-licensable Method Statement

1.1 Introduction

a) Background and scheme overview

1.1.1 SZC Co is proposing to build a new nuclear power station at Sizewell in East Suffolk, known as Sizewell C. Located to the north of the existing Sizewell B power station, the Sizewell C site is located on the Suffolk coast, approximately halfway between Felixstowe and Lowestoft; to the north-east of the town of Leiston. The project is being submitted as a component Nationally Significant Infrastructure Project (NSIP) and will be approved through the Development Control Order Process (DCO).

1.1.2 The proposed Sizewell C nuclear power station would comprise two UK EPR™ units with an expected net electrical output of approximately 1,670 megawatts (MW) per unit, giving a total site capacity of approximately 3,340MW. The design of the UK EPR™ units is based on technology used successfully and safely around the world for many years, which has been enhanced by innovations to improve performance and safety. The UK EPR™ design has passed the Generic Design Assessment process undertaken by UK regulators (Office for Nuclear Regulation and Environment Agency), and has been licenced and permitted at Hinkley Point C. Once operational, Sizewell C would be able to generate enough electricity to supply approximately six million homes in the UK.

1.1.3 In addition to the key operational elements of the UK EPR™ units, the Sizewell C Project comprises other permanent and temporary development to support the construction and operation of the Sizewell C nuclear power station. The key elements are the main development site, comprising the Sizewell C nuclear power station itself, offshore works, land used temporarily to support construction and a series of off-site associated development sites in the local area including:

- two temporary park and ride sites; one to the north-west of Sizewell C at Darsham (the ‘northern park and ride’), and one to the south-west at Wickham Market (the ‘southern park and ride’) to reduce the amount of traffic generated by the construction workforce on local roads and through local villages;
- a permanent road to bypass Stratford St Andrew and Farnham (referred to as the ‘two village bypass’) to alleviate traffic on the A12 through the villages;

- a permanent road linking the A12 to the Sizewell C main development site (referred to as 'Sizewell link road') to alleviate traffic from the B1122 through Theberton and Middleton Moor;
- permanent highway improvements at the junction of the A12 and B1122 east of Yoxford (referred to as the 'Yoxford roundabout') and other road junctions to accommodate Sizewell C construction traffic;
- a temporary freight management facility at Seven Hills on land to the south-east of the A12/A14 junction to manage the flow of freight to the main development site; and
- a temporary extension of the existing Saxmundham to Leiston branch line into the main development site ('the green rail route') and other permanent rail improvements on the Saxmundham to Leiston branch line, to transport freight by rail in order to remove large numbers of HGVs from the regional and local road network.

1.1.4 The components listed above are referred to collectively as the 'Sizewell C Project'.

1.1.5 In order to enable the proposed development of Wickham Market, as detailed above, a number of facilitating works (including vegetation clearance works and ground-breaking works) are required. Given the opportunities afforded to bats by the habitats present within the site, the proposed facilitating works have the potential to cause injury / mortality and indirect disturbance of bats that may be present. Accordingly, the purpose of this document is to provide a reasonable avoidance measures method statement that can be used by the ecological consultant, SZC Co and any relevant subcontractors, to ensure the safeguarding of bats during the facilitation works to be undertaken within the site.

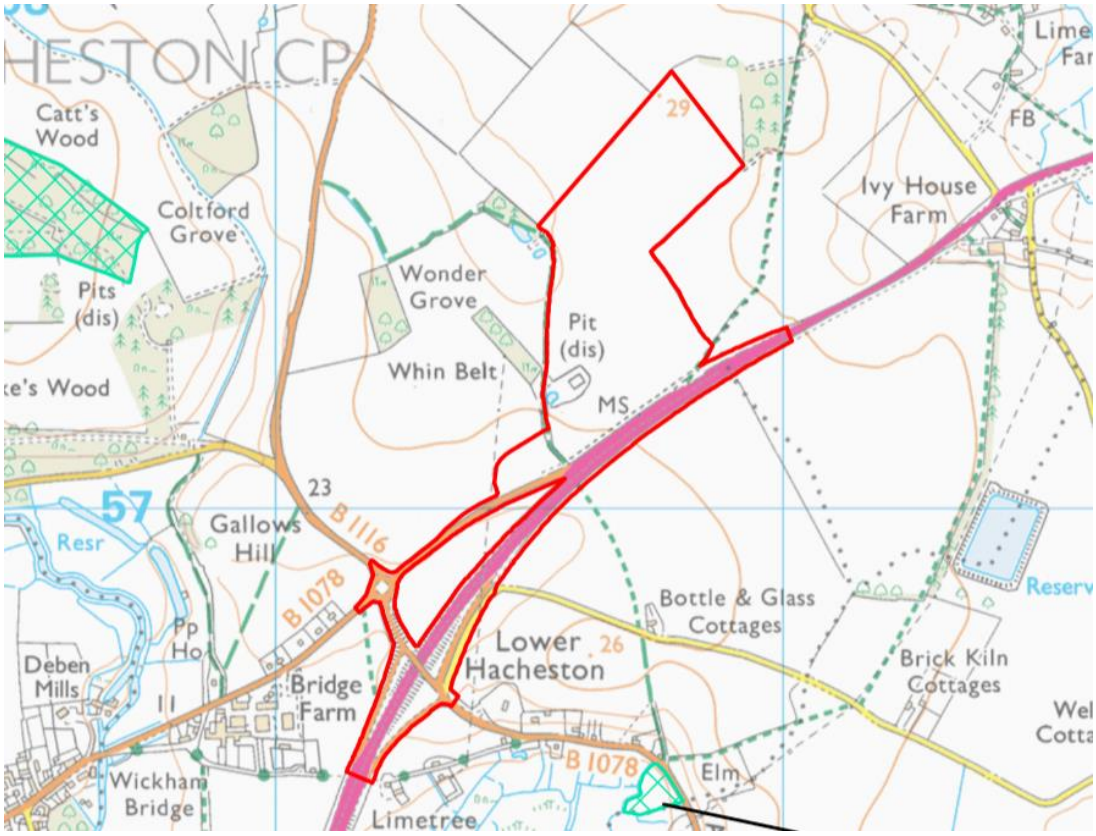
b) Site location and setting

1.1.6 The Site is located in Sizewell, East Suffolk (site centre grid reference OS Grid Reference TM 31649 57492). It is located to the north-east of Wickham Market. Access to the site would be off the slip road from the B1078 which leads to the northbound A12.

1.1.7 The site comprises large arable fields separated by a track. The crops are intensively managed and "clean" (i.e. the soil surface is essentially free of residue) and had, at the time of survey, been treated with herbicide, such that no scarce arable weeds or other notable plant species were identified. In the majority of instances, the crops had been planted up to the edges of the fields and no weedy margins were noted. The fields are bounded by fences and hedgerows. A number of blocks of woodland are present outside of the site boundary.

1.1.8 The area covered by this method statement is presented in **Plate 1.1** below.

Plate 1.1: Site location



c) Proposed works

1.1.1 The specific works covered by this method statement include vegetation clearance measures specifically in relation to the felling of trees, and the lighting arrangements for the site.

1.1.2 Perimeter and parking area lighting Lanterns will utilise LED based light fittings with zero-degree tilt, and lighting columns along the perimeter would be fitted with a demountable shield to reduce backward spill of light.

d) Key ecological constraints

1.1.3 Within this site at Wickham Market, the following are the predicted potential constraints:

- bats; and
- reptiles.

1.1.4 This method statement only covers bats, there is a second method statement for reptiles.

1.1.5 This document is presented as a first draft. SZC Co and its consultant ecologists are committed to working with Natural England and other stakeholders to develop the approaches outlined within this document to ensure a legally robust approach to protected species before the document is finalised. Further surveys will be undertaken as relevant and these will also inform the final draft of this and related documents, sufficient to inform any relevant licence.

1.2 Site Reasonable Avoidance Measures Method Statements for bats

a) Introduction

1.2.1 This section provides a suite of dedicated reasonable avoidance measures method statement for the ecological constraints that may be encountered for bats during the facilitation works.

1.2.2 The aim of the method statement is to reduce the risk of causing injury / mortality and disturbance of the protected species and avoid contravention of the relevant legislation. The ECoW will determine exactly when and where it is appropriate to apply the measures described in the reasonable avoidance measures method statement. The ECoW will oversee and quality-control the implementation of the tasks undertaken.

1.2.3 It is the responsibility of the site contractors to carry out the works in a manner which will not contravene the legislation with regards to protected species in the areas identified as having potential to support protected species. Any variations from the individual Method Statements may contravene legislation and therefore risk prosecution. Thus, it is their joint responsibility that no changes to the timings or methods outlined below are made without prior agreement from the ECoW.

b) Toolbox talk

1.2.4 Prior to commencement of the facilitation works, all site contractors will be briefed by the ECoW as part of the site induction. The toolbox talk (**Appendix 7A.5A.1)** will provide a basic overview of the life history, habitat requirements, identification and legal protection granted to the legally protected species / other species of conservation concern present on within the site that may be encountered during the works.

1.2.5 Site-specific toolbox talks will also be undertaken as necessary to identify the habitats present on site that have the potential to be used by these species

and outline the environmental measures to be followed in order to avoid breaches of legislation and / or adverse effects on protected species that could occur within or in the vicinity of the working area.

1.2.6 There is a declaration (**Appendix 7A.5A.2**) for those present to sign to confirm they have understood the constraints and actions presented.

1.3 Bats

a) Site status and potential impacts

1.3.1 Habitats within the site primarily consists of open arable land, which is of limited value for bats. However, the boundaries of the site, primarily hedgerows, as well as woodland blocks, are considered to provide suitable foraging, commuting and roosting habitat.

1.3.2 Assessments of trees within the survey area identified 13 trees with potential roost features for bats (eight high potential, one medium potential, two low potential, and two undetermined) as well as several adjacent woodland blocks which have the potential to support roosting bats.

1.3.3 Except for common and soprano pipistrelle activity, low levels of bat flight and foraging activity were recorded.

1.3.4 The construction of the proposed development would result in the loss of arable land, a short section of hedgerow (approximately 40m), and three trees with the potential to support roosting bats (two high potential and one low potential). The loss of habitat would cause a reduction in foraging habitat available to bats and the loss of features suitable for bats to roost in. The loss of the hedgerow section would remove part of a linear feature suitable for use by commuting bats.

1.3.5 The arable habitat to be temporarily lost would be approximately 18 hectares (ha) in area. This habitat, while sub-optimal, is used to a limited extent by foraging bats.

1.3.6 Bats are potentially impacted by both increased noise levels and increased lighting but only a relatively small number of bats have been recorded within the proposed development site on any one occasion. Evidence suggests that bats using the site are not dependent on the habitats present and will also be using a range of additional habitats in the wider area. No significant effects on bat populations are expected as a result of construction noise or lighting.

b) Legislation

1.3.7 All bat species in England are listed on Schedule 5 of the Wildlife and Countryside Act 1981 (as amended) (Ref 1.1) in respect of Section 9, which makes it an offence, inter alia, to:

- intentionally or recklessly kill, injure or take a bat;
- intentionally or recklessly damage, destroy or obstruct access to any structure or place that a bat uses for shelter or protection; or
- intentionally or recklessly disturb a bat while it is occupying a structure or place that it uses for shelter or protection.

1.3.8 The offence "recklessly" was added by the Countryside and Rights of Way Act 2000 (CRoW) (Ref 1.2)).

1.3.9 All bat species in England receive further protection under Regulation 41 of The Conservation of Habitats and Species Regulations 2017 (Ref. 1.4). They are listed on Schedule 2 of the Regulations, which makes it an offence, *inter alia*, to:

- deliberately capture, injure or kill a bat;
- deliberately disturb a bat, in particular any disturbance which is likely:
  - impair their ability
    - to survive, to breed or reproduce, or to rear or nurture their young, or
    - to hibernate or migrate
  - affect significantly the local distribution or abundance of that bat species; or
- damage or destroy a breeding site or resting place of a bat.

1.3.10 Noctule (*Nyctalus noctule*), soprano pipistrelle (*Pipistrellus pygmaeus*) and brown long-eared bat (*Plecotus auratus*) are also included on Section 41 of the NERC Act 2006 (Ref 1.3). This Act places a duty upon public bodies to have regard to the purpose of conserving biodiversity within all of their actions. The species listed under Section 41 are 'Species of Principal Importance for the conservation of biodiversity in England' for which conservation steps should be taken or promoted.

c) Toolbox talk for bats

1.3.11 Prior to commencement of the vegetation clearance works, all site contractors will be briefed by the ECoW as part of the site induction to provide them with a basic overview of the life history, habitat requirements, identification and legal protection granted to bats. Specific toolbox talks will also be undertaken as necessary to identify the habitats present within the site that have the potential to be used by bats and outline the environmental measures to be followed in order to avoid breaches of legislation and / or adverse effects on bats that could occur within or in the vicinity of the working area.

d) Precautionary working methods

1.3.12 Construction lighting would be designed so that light spill beyond the site boundary would be minimal and there would be no substantive light spillage into adjacent habitats and woodland blocks including Whin Belt. The lighting design for the proposed development would use light fittings chosen to limit stray light. Guidance within the latest Institution of Lighting Professionals Guidance Note (Ref 1.5) would be followed as far as possible. These measures would minimise impacts on nocturnal species such as bats that may use the nearby tree lines or habitats for roosts or foraging.

1.3.13 In addition, although some activities may require 24 hour working, the majority of construction would take place Monday to Saturday 07:00 to 19:00 hours. This means night-time works would be avoided, which is when bats are most active. Incidental mortality associated with traffic movements would therefore not have a significant effect on the bat assemblage.

1.3.14 Close-boarded fencing where the proposed development site abuts areas of woodland to provide additional protection from vehicle headlights and noise.

1.3.15 Initially all trees to be removed will be reassessed for bat roosting potential.

1.3.16 Any trees identified as having low bat roosting potential will be removed using a soft felling methodology outlined below with a suitability experienced, appropriately licensed, bat worker or bat worker assistant present. It is recommended that trees are removed in October, thereby avoiding the sensitive maternity (April-September) and hibernation (November-February) periods for bats.

1.3.17 For any trees with moderate or high roosting potential, a thorough pre works check for roosting bats will be undertaken. The methodology and required survey effort for these pre works checks will depend upon the status of the roosting features within the trees, but may include:

- a climbed or ground based tree inspection using an endoscope and / or torch; and
- emergence / re-entry surveys.

1.3.18 Should any of the trees to be removed be found to support bat roosts, an EPS licence is likely to be required. The documents associated with this licence will outline the required mitigation, and the required measures are not discussed further within this report.

1.3.19 Should additional emergence re-entry surveys be required these will be undertaken between April and September inclusive. If no roosts are found, the approach outlined below will be undertaken.

1.3.20 All trees with potential roost features for bats should be soft felled using the following precautionary measures:

- trees classed as having low potential to support roosting bats, shall be felled under the watching brief of the ECoW;
- where potential roost features for bats cannot be exhaustively checked they should be section felled, with each section carefully lowered to the ground. Cuts should be made at least 50 cm beyond the extent of the potential roost feature;
- if limbs or large branches require felling, consideration should be given to cracks which may close (crushing any bats inside) once the weight of the limb has been removed. If the crack cannot be thoroughly inspected to ensure bats are not present, the crack should be wedged open prior to removal of the limb/branch;
- the stems of dense ivy should be cut at ground level at least 48 hours before the tree is felled; and
- once the trees have been felled the potential roost features should be re-checked on the ground by a suitably experienced bat ecologist. If any potential roost feature can still not be exhaustively checked that section should be allowed a rest period of at least 24 hours to ensure that any individual bats that may have been missed are given the opportunity to relocate.

1.3.21 If any bats are encountered during the felling operations all works and activity must cease immediately, until the ECoW has advised on the most appropriate manner to deal with the situation.

1.3.22 To mitigate for the loss of the tree and potential roost resources, bat boxes would be installed on retained trees in suitable locations within the site boundary, prior to felling. One bat box would be installed per tree with

medium or high bat roost potential that is due to be lost, whether or not a roost has been identified. A variety of bat boxes would be used to support different species.

1.4 Facilitating work requirements

a) Vegetation clearance methods

1.4.1 As set out above, vegetation clearance works are required in order to facilitate the development of the site. Given that the works are to take place outside of the active bird breeding season (early March and late August inclusive), it is considered that no nesting bird checks are required prior to the commencement of works. Nevertheless, should vegetation clearance works take place within the core bird breeding season, a qualified ECoW will need to carry out a nesting bird check at least 48 hours before the commencement of works effecting the vegetation within the site. Once nesting birds have been confirmed absent, then the vegetation clearance contractors will carry out a habitat manipulation exercise in the form of a two stage vegetation cut, with the initial cut reducing the vegetation to a height of 150mm before a second cut subsequently reduces it to ground level, with a minimum of two hours between cuts to allow reptiles or amphibians to move out of the cutting area.

1.4.2 Vegetation clearance which does not disturb the ground or vegetation below 150mm can be conducted year-round with a low risk of impacting upon reptiles. Any vegetation clearance likely to impact vegetation below 150mm or the removal of places of shelter/hibernation features would be undertaken outside of the reptile hibernating period (October to February inclusive), during periods of warm, dry weather. If this is not possible, vegetation would be cut to the ground (to remove potential bird nesting habitat), but the roots would remain intact until hibernation is complete. The root system of vegetation would then be removed once the reptile and amphibian hibernation season is over. Clearing of vegetation would be undertaken under the supervision of the suitably experienced Ecological Clerk of Works (ECoW).

1.4.3 The vegetation arisings will be collected and used to create habitat piles in areas adjacent to the site (which are to be retained during the development works).

1.4.4 Works should be undertaken outside of all tree and hedgerow root protection zones that would not be removed as part of the proposed development. Tree protective fencing as described in section 6.2 of British Standard 5837:2012 (Ref 1.6) should be installed (distance of fencing from tree trunk = 12x trunk diameter, distance from hedgerows =1m from the spread of hedgerow canopy), where required, prior to plant and machinery arriving on site and

construction works commencing. The fencing should remain intact throughout the duration of the works and only be removed upon completion. Weather-proof notices should be attached to any protective fencing located adjacent to retained trees displaying the words 'Construction Exclusion Zone'. All personnel must be made aware of these restrictions. If works need to be undertaken within the root protection zones an Arboricultural survey would be required and any advice provided adhered to, to secure the long-term survival of the tree/hedgerow.

References

1.1 Her Majesties Stationary Office (HMSO) (1981). The Wildlife and Countryside Act (as amended). HMSO, London.

1.2 HMSO (2000) The Countryside Rights of Way (CRoW) Act. HMSO, London

1.3 HMSO (2006). The Natural Environment and Rural Communities Act. HMSO, London

1.4 HMSO (2017). The Conservation of Habitats and Species Regulations. HMSO, London.

1.5 Institute of Lighting Professional /Bat Conservation Trust (2018). Institution of Lighting Professionals. 2018. Bats and artificial lighting in the UK. Guidance Note 08/2018.

1.6 British Standards Institute. (2012). British Standard for Trees in relation to design, demolition and construction (BS 5837:2012). British Standards Institute. 2012

Appendix 7A5A.1: Ecological Tool Box Talk

1.1 Legislation

1.1.1 Ecology surveys have been completed within the site and have identified the potential for the presence of a legally protected species. The Ecological Method Statement details the mitigation and working methods that should be adopted to avoid contravention of the legislation. If this is not followed, there is a risk that you could break the law by doing actions such as:

- Deliberately capture, injure or kill;
- Damage or destroy a resting place or breeding site;
- Deliberately or recklessly disturb an individual while it's in a structure or place of shelter or protection;
- Block access too structures or places of shelter or protection; or
- Possess, sell, control or transport live or dead individuals.

1.1.2 Any of the following could happen if you're found guilty of any offence:

- You could get an unlimited fine;
- You could be sent to prison for up to 6 months.

1.2 Species Identification

Nesting Birds

The bird nesting season extends from March to August inclusive, although in mild climate nesting may start in February.

Nesting occurs in a variety of habitats including agricultural fields (ground nesting birds), dense bramble scrub, buildings and other man-made structures and trees.

	Reptiles (slow-worm, common lizard, grass snake and adder) They may be found sheltering in vegetation, under debris such as logs, ricks or piles of rubble or waste items. They may also bask in the open on sunny days. DO NOT leave materials in area where it might be colonised by reptiles. Any debris or materials should be moved with care or moved under direct supervision of a suitably qualified ecologist.
	Bats On site habitats where bats may roost include trees. If works involve trees with cavities then check with the on-site ecologist that these have been inspected.
	Badgers It is unlikely that the animals would be seen but signs of their presence include: • Setts (d shaped burrow with a large spoil heap); • Latrines or dung pits; and • Snuffle holes and runs.

1.3 Action

- If any species, or signs characteristic of protected species in the vicinity of the works are apparent, OR IF IN ANY DOUBT, stop the works immediately and contact the Project ecologist;
- The species involved may then be identified and appropriate action such as further surveys or mitigation taken; and
- Do not attempt to move any species found unless instructed to do so by an ecologist.

Appendix 7A5A.2: Declaration

By signing the register below you confirm that you have received the ECOLOGY TOOLBOX TALK (Appendix 1) AND METHOD STATEMENT briefing provided by the project ecologist for the Wickham Sizewell C Scheme.

Date	Name	Role on Site	Signature

VOLUME 4, CHAPTER 7, APPENDIX 7A.5B: REPTILE METHOD STATEMENT

Contents

Tables

None Provided.

Plates

Appendices

1 Reptile Non-Licensable Method Statement

1.1 Introduction

a) Background and Scheme Overview

1.1.1 SZC Co. is proposing to build and operate a new nuclear power station on the Suffolk coast, known as Sizewell C Power Station (hereafter referred to as 'Sizewell C') located to the north of the existing Sizewell B Power Station.

1.1.2 It is located to the north of the existing Sizewell B power station, the Sizewell C site is located on the Suffolk coast, approximately halfway between Felixstowe and Lowestoft; to the north-east of the town of Leiston.

1.1.3 This Reptile Method Statement compiled by Arcadis Consulting (UK) Limited (hereafter referred to as 'Arcadis') outlines the key approaches to mitigating potential impacts to the reptile populations present at Wickham Market. It will be used by the ecological consultant, SZC Co and any relevant subcontractors, in relation to the proposal to build the Sizewell C.

1.1.4 The proposed Sizewell C nuclear power station would comprise two UK EPR™ units with an expected net electrical output of approximately 1,670 megawatts (MW) per unit, giving a total site capacity of approximately 3,340MW. The design of the UK EPR™ units is based on technology used successfully and safely around the world for many years, which has been enhanced by innovations to improve performance and safety. The UK EPR™ design has passed the Generic Design Assessment process undertaken by UK regulators (Office for Nuclear Regulation and Environment Agency), and has been licenced and permitted at Hinkley Point C. Once operational, Sizewell C would be able to generate enough electricity to supply approximately six million homes in the UK.

1.1.5 In addition to the key operational elements of the UK EPR™ units, the Sizewell C Project comprises other permanent and temporary development to support the construction and operation of the Sizewell C nuclear power station. The key elements are the main development site, comprising the Sizewell C nuclear power station itself, offshore works, land used temporarily to support construction including an

accommodation campus and a series of off-site associated development sites in the local area including:

- two temporary park and ride sites; one to the north-west of Sizewell C at Darsham (the 'northern park and ride'), and one to the south-west at Wickham Market (the 'southern park and ride') to reduce the amount of traffic generated by the construction workforce on local roads and through local villages;
- a permanent road to bypass Stratford St Andrew and Farnham (referred to as the 'two village bypass') to alleviate traffic on the A12 through the villages;
- a permanent road linking the A12 to the Sizewell C main development site (referred to as 'Sizewell link road') to alleviate traffic from the B1122 through Theberton and Middleton Moor;
- permanent highway improvements at the junction of the A12 and B1122 east of Yoxford (referred to as the 'Yoxford roundabout') and other road junctions to accommodate Sizewell C construction traffic;
- a temporary freight management facility at Seven Hills on land to the south-east of the A12/A14 junction to manage the flow of freight to the main development site; and
- a temporary extension of the existing Saxmundham to Leiston branch line into the main development site ('the green rail route') and other permanent rail improvements on the Saxmundham to Leiston branch line, to transport freight by rail in order to remove large numbers of HGVs from the regional and local road network.

1.1.6 The components listed above are referred to collectively as the 'Sizewell C Project'.

b) Site Location and Setting

1.1.1 The southern park and ride at the Wickham Market site measures approximately 26.4ha in area and is located north-east of Wickham Market. The part of the site which would contain the parking and buildings, postal consolidation building and Traffic Incident Management Area (TIMA) is approximately 18ha in size and located to the east of the B1078/B1116 and to the north of the A12. The remainder of the site encompasses a section of the A12, and an associated slip road where highway improvements are

proposed to form the site access and include the provision of signage and road markings.

1.1.2 The proposed development would provide spaces for up to 1,250 cars and would allow the transfer to and from the main development site, therefore reducing the construction workforce traffic on the roads between the A12 and the main development site. A postal consolidation facility would also be part of the proposed development. The proposed development is temporary and would be in situ until the construction of the Sizewell C power station is complete (between 9-12 years).

1.1.3 The site is dominated by arable farmland, which was noted to be “clean” at the time of the 2018 survey, having been treated with an intensive herbicide such that no arable weeds or other plant species were recorded within the area of arable land. The site also supports six woodland blocks, comprising broad-leaved plantation, broad-leaved semi-nature woodland and lowland mixed deciduous woodland, along with an area of improved grassland, an area of tall ruderal vegetation and a number of hedgerows, which bound the arable land within the site. In addition, the site also supports a single pond.

1.1.4 The area covered by this method statement is presented in **Plate 1.1** below.

Plate 1.1: Site location

1.1.5 The purpose of the proposed development would be to reduce the amount of additional traffic generated by the construction workforce on local roads and through local villages as a result of the Sizewell C Project. The southern

park and ride at Wickham would be used by construction workers approaching Sizewell C from the south on the A12, with workers then being transported to and from the Sizewell C main development site by bus. The park and ride facilities would also intercept traffic movements from locations west of the A12. However, as a component of this, vegetation clearance and ground-breaking works (collectively referred to as "facilitating works" within this report) will be required in order to facilitate the proposed development. Accordingly, a number of potential ecological constraints are associated with the proposed facilitating works, as are set out below.

c) Key Ecological Constraints

1.1.7 The key potential legislative constraints associated with the facilitation works within the site include:

- bats; and
- reptiles.

1.1.8 This method statement only covers guidance relating to reptiles, however a method statement for bats has also been prepared.

1.1.9 This document is presented as a first draft. SZC Co and its consultant ecologists are committed to working with Natural England and other stakeholders to develop the approaches outlined within this document to ensure a legally robust approach to protected species before the document is finalised. Further surveys will be undertaken as relevant and these will also inform the final draft of this and related documents.

1.1.10 In order to enable the proposed development of the southern park and ride at the Wickham site, as detailed above, a number of facilitating works (including vegetation clearance works and ground-breaking works) are required. Given the opportunities afforded to reptiles by the habitats present within the site, the proposed facilitating works have the potential to cause injury/ mortality to reptiles should they be present within the site at the time of the works. Accordingly, the purpose of this document is to provide a reasonable avoidance measures method statement that can be used by the ecological consultant, SZC Co and any relevant subcontractors, to ensure the safeguarding of reptiles during the facilitation works to be undertaken within the site.

1.2 Site Reasonable Avoidance Measures Method Statements for reptiles

a) Introduction

1.2.1 This section provides a suite of dedicated reasonable avoidance measures method statement for the ecological constraints that may be encountered for reptiles during the facilitation works.

1.2.2 In all cases the aim of the method statement is to reduce the risk of causing injury / mortality of the protected species and avoid contravention of the relevant legislation. The Ecological Clerk of Works (ECoW) will determine exactly when and where it is appropriate to apply the measures described in the reasonable avoidance measures method statement. The ECoW will oversee and quality-control the implementation of the tasks undertaken.

1.2.3 It is the responsibility of the site contractors to carry out the works in a manner which will not contravene the legislation with regards to protected species in the areas identified as having potential to support protected species. Any variations from the individual Method Statements may contravene legislation and therefore risk prosecution. Thus, it is their joint responsibility that no changes to the timings or methods outlined below are made without prior agreement from the ECoW.

b) Toolbox Talk

1.2.4 Prior to commencement of the facilitation works, all site contractors will be briefed by the ECoW as part of the site induction. The toolbox talk (**Appendix 7A.5B.1**) will provide a basic overview of the life history, habitat requirements, identification and legal protection granted to the legally protected species / other species of conservation concern present on within the site that may be encountered during the works.

1.2.5 Site-specific toolbox talks will also be undertaken as necessary to identify the habitats present on site that have the potential to be used by these species and outline the environmental measures to be followed in order to avoid breaches of legislation and / or adverse effects on protected species that could occur within or in the vicinity of the working area.

1.2.6 There is a declaration (**Appendix 7A.5B.2**) for those present to sign to confirm they have understood the constraints and actions presented.

1.3 Reptiles

a) Site Status

1.3.1 The majority of this site comprises intensively managed arable fields which are unsuitable for reptiles. However, an area of tall ruderal herbs at the west corner of Whin Belt, the track to and margins of the small patch of woodland to the north of Whin Belt, and the disused pit area to the south of Whin Belt provide habitat that is suitable foraging habitat for small numbers of reptiles. The woodland areas also have the potential to provide hibernation sites. The desk-study data received from the Suffolk Biodiversity Information Service returned a number of records within 2km of the site, although none were returned from within the site.

1.3.2 Accordingly, given that the extent of this habitat is quite limited such that it is unlikely that the site is of elevated potential to reptiles. Nevertheless, given the presence of suitable habitat within and adjacent to the site, there is the potential for this species group to make at least occasional use of the site.

b) Legislation

1.3.3 There are four common and widespread species of reptile that are native to Britain, i.e. common or viviparous lizard (*Zootoca vivipara*), slow worm (*Anguis fragilis*), adder (*Vipera berus*) and grass snake (*Natrix natrix*). Grass snake is also listed on Schedule 5 of the Wildlife and Countryside Act (as amended) (Ref 1.1) in respect of Section 9, which makes it an offence, inter alia, to intentionally (or recklessly) kill or injure this species (recklessly as added by the Countryside and Rights of Way Act (CroW) Act (Ref 1.2)).

1.3.4 Common lizard, slow worm, adder and grass snake are also included on Section 41 of the Natural Environment and Rural Communities (NERC) Act 2006 (Ref. 1.3). This Act places a duty upon public bodies to have regard to the purpose of conserving biodiversity within all of their actions. The species listed under Section 41 are 'Species of Principal Importance for the conservation of biodiversity in England' for which conservation steps should be taken or promoted.

c) Toolbox Talk

1.3.5 Prior to commencement of the vegetation clearance works, all site contractors will be briefed by the ECoW as part of the site induction to provide them with a basic overview of the life history, habitat requirements, identification and legal protection granted to reptiles.

1.3.6 Site-specific toolbox talks will also be undertaken as necessary to identify the habitats present within the site that have the potential to be used by reptiles and outline the environmental measures to be followed in order to avoid breaches of legislation and / or adverse effects on reptiles that could occur within or in the vicinity of the working area. The toolbox talk will stress that potential reptile refugia / hibernation features should be left undisturbed; and reptiles should not be handled by contractors.

d) Precautionary Working Methods

1.3.7 The exact timings of the vegetation clearance works are currently unknown. However, these works will need to consider potential impacts to other receptors in addition to reptiles, particularly nesting birds, dependent upon the timings of the works.

1.3.8 Vegetation clearance which does not disturb the ground or vegetation below 150mm can be conducted year-round with a low risk of impacting upon reptiles, however there are seasonal constraints in relation to birds. Potential impacts to nesting birds will need to be considered of vegetation removal is required between March and August inclusive (generally considered to be the bird nesting season).

1.3.9 Any vegetation clearance likely to impact vegetation below 150mm or which is likely to impact the ground layer or features which offer reptiles shelter or protection should take place during the active reptile period (March to October (inclusive), although the exact timings are weather dependant). In order to avoid disturbing reptiles during hibernation (the period where reptiles are most vulnerable). Accordingly, with respect to the proposed clearance of suitable reptile habitat, it is proposed that a staged vegetation clearance exercise is undertaken under the direct supervision of the ECoW, in order to reduce the suitability of the habitats within the site.

1.3.10 Where it is necessary to undertake vegetation clearance in and around suitable reptile habitat the following precautionary measures will be put in place to avoid encountering and accidentally injuring reptiles:

- vegetation clearance (below 150mm) and ground-breaking works will only be conducted in the active season (March to October inclusive

seasonally dependant)[1] and when the weather is suitable (i.e. it is warm, approximately 8ºC should be the minimum temperature). The works should not be conducted early in the morning before reptiles have had a chance to 'warm up';

- the ECoW will work with the contractor to determine a cutting regime whereby any animals present are encouraged away from the cutting into retained habitats and not isolated in an unsuitable area. This area will be walked by the ECoW to disturb reptiles prior to works commencing;
- the ECoW will also consider any impacts to ground nesting birds, if appropriate and assess any risk;
- initially, vegetation is to be cleared to reduce cover for reptiles (at a minimum 150mm from the ground in the first pass);
- subsequent to this, a suitable period of time as decided by the ECoW will be given to allow for any reptiles present at the time of works to move away from the cut areas;
- the grassland / remaining vegetation will then be cut to as close to ground level as possible;
- vegetation cuttings are to be piled within the site so as to create additional sheltering opportunities to reptiles within the site;
- any suitable reptile sheltering features (e.g. log piles, compost heaps or debris) will be identified by the on-site ecologist. These will be avoided if possible, if not they will be checked by the ECoW before their removal (should this be required). Any removal of sheltering habitats will be supervised by the ECoW. These will be dismantled by hand; this should be overseen by the ecologist. If a reptile is found the ecologist will decide whether or not it is appropriate to relocate the animal;
- shelter features that require removal should be reinstated near the clearance area in a quiet, sheltered location. This will ensure that no net loss of potential reptile shelter features takes place. If possible, shelter features should be dismantled by hand and moved out of the

[1] Advanced works approach would integrate vegetation clearance in relation to reptiles and bats as necessary; each having preferential periods for vegetation removal; an integrated approach could include cutting to near ground level during winter, then clearance of the lowest trunks and roots under supervision in spring

working area, supervised by the ECoW where appropriate. Such materials will be lifted (not dragged) out of the working area; and

- if reptiles are found, the ECoW will move the animals out of the way to a place of safety. This location would be decided on a case-by-case basis, but it would be within the one designated reptile receptor areas (Kenton Hills, St. James Covert and Broom Covert) near to a suitable refuge or hibernation feature, surrounded by suitable foraging and basking habitat and judged to be a safe distance from the ongoing vegetation clearance works. Reptiles will not be handled by contractors, as common lizards and slow worms may shed their tails if handled inappropriately.

1.3.11 Should any reptiles be found on site during the works when the ECoW isn't present, the ECoW should be contacted immediately for advice.

1.4 Facilitating Work Requirements

a) Vegetation Clearance Methods

1.4.1 As set out above, vegetation clearance works are required in order to facilitate the development of the site. A staged vegetation clearance exercise at a suitable time of year will be undertaken in order to safeguard any reptiles present at the time of works. Such works will take place under the supervision of the ECoW. Such an approach will minimise the potential harm caused to reptiles within the site as it will avoid disturbing this species group during the hibernation period.

1.4.2 Prior to commencement of the vegetation clearance works, the ECoW will liaise with the contractor to clearly demarcate the required working areas.

1.4.3 If shelter features are present (i.e. log and vegetation piles), those will be checked by the ECoW before their removal (should this be required).

1.4.4 If shelter features are present that require removal, those should be reinstated near the clearance area in a quiet, sheltered location. This will ensure that no net loss of potential reptile shelter features takes place. If possible, shelter features should be dismantled by hand and moved out of the working area, supervised by the ECoW where appropriate. Such materials will be lifted (not dragged) out of the working area.

1.4.5 Should works be required in winter (November to February inclusive) or in cold weather (below 8^{o}C overnight temperature) the ECoW will advise upon

bespoke working methods. Likely to require a hand search and a staged vegetation clearance approach under direct supervision.

1.4.6 The vegetation arisings will be collected and used to create habitat piles in areas adjacent to the site (which are to be retained during the development works).

b) Vegetation Clearance Equipment

1.4.7 The vegetation clearance contractors on site will utilise equipment specific to their clearance methods as per their reasonable avoidance measures. For example:

- John Deere 3 series compact with cut and collector flail;
- John Deere 4 series compact tractor with side arm flail; and
- brushcutter, rakes, pitchforks and other hand tools.

Plate 1.2: Vegetation clearing equipment

	
John Deere 3 series compact tractor	*John Deere 4 series tractor*
	
Brushcutter	

c) Ground-breaking Works Methods

1.4.8 Given that vegetation clearance works are to take place within the site prior to the commencement of any ground-breaking works, it is likely that the risk of encountering reptiles will be reduced, due to the absence of suitable habitat within the areas proposed for ground-breaking works.

1.4.9 Reptiles are known to enter hibernation by burrowing underground, by settling into tree root systems or by entering voids and crevices in the ground or surrounding material. Accordingly, should the works take place during the reptile hibernation period (the dormancy period runs from November to February (inclusive) and ideally should be avoid where possible), it is considered necessary for the ground-breaking works to be undertaken under direct supervision of the ECoW. Small sections of the topsoil removed and inspected by the ECoW. Hand-digging under ECoW supervision may also be required.

d) Ground-breaking Works Equipment

1.4.10 Contractors will utilise the equipment as per their reasonable avoidance measures. For example:

- JCB 16C-I new generation 1 tonne mini digger;
- spade;
- spill kits; and
- Chapter 8 barrier/ Heras fencing.

Plate 1.3: Ground-breaking works equipment

	
JCB 16C-I New Generation 1 Tonne Mini Digger	*Chapter 8 barrier/ Heras fencing*

References

1.1 Her Majesties Stationary Office (HMSO) (1981). The Wildlife and Countryside Act (as amended). HMSO, London.

1.2 HMSO (2000) The Countryside Rights of Way (CRoW) Act. HMSO, London

1.3 HMSO (2006). The Natural Environment and Rural Communities Act. HMSO, London

Appendix 7A.5B.1: Toolbox Talk

Reptiles

Reptiles in the UK

IF BITTEN SEEK MEDICAL HELP IMMEDIATELY.

Legal Protection
All reptile species are protected.

Likely to be found in:

Reptiles typically dormant between November and February. Sheltering/hibernation sites include log / brash piles, mammal burrows and tree / hedgerow roots.

Appendix 7A.5B.2: Declaration of Understanding

Toolbox talk title:	Ecology
Given by:	
Site:	
Date:	

Name	Company	Signature

Name	Company	Signature