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6.2 Appendix 8F: Great Crested Newt survey report

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Planning Act 2008

Infrastructure Planning (Applications: Prescribed Forms and
Procedure) Regulations 2009



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(Applications: Prescribed Forms and
Procedure) Regulations 2009**

Sunnica Energy Farm

Appendix 8F: Great Crested Newt survey report

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Executive summary

In March 2019, AECOM (on behalf of Sunnica Limited) undertook a Preliminary Ecological Appraisal (PEA) (Ref 7-1) for the proposed Sunnica Energy Farm (hereafter referred to as the Scheme). This PEA identified the need for follow-up surveys to determine the potential impacts of the Scheme on protected and notable species, including Great Crested Newt.

A review of Ordnance Survey (OS) mapping of the Scheme, as part of the desk study for the PEA, identified that the habitat within the Development Consent Order (DCO) Site (the Site) (the Order limits) was suitable to support Great Crested Newt. Surveys were therefore required to determine the presence or likely absence of Great Crested Newt within the Order limits and an appropriate survey buffer of 500m (referred to hereafter as the survey area).

A total of 38 waterbodies or watercourses were identified within the survey area as needing to be assessed for their suitability to support Great Crested Newt.

Of the 38 waterbodies or watercourses identified within the survey area the HSI surveys identified:

- a. no ponds with 'excellent' suitability for Great Crested Newt;
- b. seven ponds with 'good' suitability for Great Crested Newt;
- c. one pond with 'average' suitability for Great Crested Newt;
- d. seven ponds with 'below average' suitability for Great Crested Newt; and
- e. five ponds with 'poor' suitability for Great Crested Newt.

Five waterbodies were not surveyed due to their isolation from the Scheme and, or, the distance between the Scheme and each waterbody. Furthermore, 13 waterbodies were visually inspected for their suitability for Great Crested Newt but were not fully surveyed using HSI methods as they were unsuitable to support this species.

Field surveys, or eDNA surveys, were then undertaken on the most suitable waterbodies or watercourses.

No Great Crested Newt were recorded within any of the waterbodies or watercourses surveyed within the Order limits during the Great Crested Newt surveys. However, a positive Great Crested Newt eDNA sample was recorded from one waterbody, approximately 150m from the Sunnica East Site B.

The Scheme will not impact on this waterbody, used by Great Crested Newt, as this waterbody is situated approximately 150m north of the Order limits. Furthermore, the developable areas of the Scheme (within the Order limits) are at a greater distance than 250m from this waterbody.

A precautionary method of working will be adopted during construction of the Sunnica East Site B in consideration of the legal status of Great Crested Newt.

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1 Introduction

1.1.1 In March 2019, AECOM (on behalf of Sunnica Limited), undertook a Preliminary Ecological Appraisal (PEA) (Ref 1) for the proposed Sunnica Energy Farm (hereafter referred to as the Scheme). This PEA identified the need for follow-up surveys to determine the potential impacts of the Scheme on protected and notable species¹, including Great Crested Newt *Triturus cristatus*.

1.1.2 A review of Ordnance Survey (OS) mapping of the Scheme, as part of the desk study for the PEA, identified that the habitat within the Development Consent Order (DCO) Site (the Site) (also referred to as the Order limits) was suitable to support Great Crested Newt. Surveys were therefore required to determine the presence or likely absence of Great Crested Newt within the Order limits and an appropriate survey buffer of 500m (referred to hereafter as the survey area).

1.2 The Scheme

1.2.1 Sunnica Energy Farm (the Scheme) is a new solar energy farm proposal that will deliver electricity to the national electricity transmission network. Sunnica Limited is proposing to install ground mounted solar photovoltaic (PV) panel arrays to generate electrical energy from the sun and combine these with a Battery Energy Storage System (BESS) which will connect to Burwell National Grid Substation in Cambridgeshire.

1.2.2 Electricity will be generated at Sunnica East Site A, near Isleham in Cambridgeshire; Sunnica East Site B, near Worlington and Freckenham in Suffolk; Sunnica West Site A near Chippenham and Kennett in Cambridgeshire; and Sunnica West Site B, near Snailwell in Cambridgeshire. All locations will comprise ground mounted solar PV panel arrays, supporting electrical infrastructure and, with the exception of Sunnica West Site B, a BESS.

1.2.3 Supporting electrical infrastructure will include on-site substations on Sunnica East Site A and Sunnica East Site B and Sunnica West Site A, and on-site cabling between the different electrical elements across the Scheme. The generating equipment of the Scheme will be fenced and protected via security measures such as Closed Circuit Television. Inside the fenced areas, in addition to the generating equipment will be, internal access tracks, and drainage. It is not proposed for any area to be continuously lit.

1.2.4 Visual, ecological and archaeological mitigation is proposed which includes proposed grassland planting and new woodland; retention of existing woodland, wetlands and other vegetation; provision of replacement habitat; and offsetting areas, where there will be no development. The BESSs will consist of a compound and battery array to allow for the importation, storage and exportation of energy to the National Grid. There will also be areas at Sunnica East Site A and Sunnica East Site B for office and storage facilities for use during the Scheme's operation.

1.2.5 The Scheme will be connected to a new substation extension at the existing Burwell National Grid Substation, using 132 kilovolt (kV) cables buried underground. The cables will run between Sunnica East Site A, Sunnica East Site

¹ A notable species is a species with a conservation designation, but no legal protection.

B and Sunnica West Site A (Grid Connection Route A), and then from Sunnica West Site A to Sunnica West B and onwards to the Burwell National Grid Substation (Grid Connection Route B). The Burwell National Grid Substation Extension will convert the 132kV to 400kV. The 400kV cables will be buried and will connect the Scheme to the existing Burwell National Grid Substation to allow distribution to the national transmission network.

- 1.2.6 The Scheme will have two main access points, one north of Elms Road at Sunnica East Site B and one south of La Hogue Road at Sunnica West Site A. The main access route to Sunnica West Site A will be via the Chippenham junction of the A11, to the north of junction 38 of the A14. Sunnica East Site B will be accessed via the A11 and B1085. A number of secondary access points are proposed to access the individual land parcels through construction, operation, and decommissioning phases.
- 1.2.7 The Scheme is defined as a Nationally Significant Infrastructure Project (NSIP) and will require a Development Consent Order (DCO) from the Secretary of State for Business, Energy and Industrial Strategy (Secretary of State), due to its generating capacity exceeding 50 megawatts (MW).
- 1.2.8 The Scheme comprises the following key areas:
- a. Solar Farm Sites:
 - i. Sunnica East Site A;
 - ii. Sunnica East Site B;
 - iii. Sunnica West Site A; and
 - iv. Sunnica West Site B.
 - b. associated electrical infrastructure areas for connection to the national transmission system:
 - i. Grid Connection Route A ('A1' - connecting the Sunnica East Site A with the Sunnica East Site B and then 'A2' connecting to the Sunnica West Site A);
 - ii. Grid Connection Route B ('B1' connecting the Sunnica West Site A and Sunnica West Site B and 'B2' connecting the Burwell National Grid Substation); and
 - iii. Burwell National Grid Substation Extension.
- 1.2.9 **Figure 1** in Annex B shows the locations of these key areas.

1.3 Site description

- 1.3.1 A summary description of the habitats within the Scheme boundary (made up of the four Sites (see section 1.2.1)) is provided below and a more detailed description of the habitats is provided in the PEA report (Ref 1). The extent of the Scheme is shown in **Figure 1**.

Sunnica East Site

- 1.3.2 Sunnica East is split into two sub-sites, one to the north of Freckenham (referred to as Sunnica East Site A) and the other to the south of Worlington (referred to as Sunnica East Site B). These two sites are approximately 1km apart and are separated by agricultural fields. The Sunnica East Site A encompasses an area of

approximately 224ha and includes land within the county of Suffolk and Cambridgeshire. Sunnica East Site B lies within Suffolk and encompasses an area of approximately 319ha (**Figure 1**).

- 1.3.3 The landscape features within the Sunnica East Site A and Sunnica East Site B consist of arable agricultural fields interspersed with individual trees, hedgerows, linear tree belts, small woodland blocks, farm access tracks and local roads.
- 1.3.4 The landscape features immediately surrounding the Sunnica East Site A and Sunnica East Site B comprise small rural villages, including Worlington to the north, Barton Mills to the north-east, Red Lodge and Freckenham to the south and Isleham to the west. Industrial land uses adjoin the A11 to the south of the Sunnica East Site with an industrial installation of a 7.5 MW solar farm situated adjacent to the south-eastern extent of the Sunnica East Site and an anaerobic digestion (AD) plant located to the south of the Sunnica East Site.

Sunnica West Site

- 1.3.5 The Sunnica West Site is located within the East Cambridgeshire District Council administrative area, approximately 3km north east of Newmarket and 6.5km east of Burwell.
- 1.3.6 Sunnica West is split into two sub-sites, one to the south-east (referred to as Sunnica West Site A) and the other to the north-west of Snailwell (referred to as Sunnica West Site B). These two sites are approximately 1km apart, separated by agricultural fields and Chippenham Road. The Sunnica West Site A encompasses an area of approximately 373ha and includes land to the east and west of the A11, consisting of agricultural fields bounded by trees, managed hedgerows, linear tree shelter belts, small woodland and copses and farm access tracks. Sunnica West Site B encompasses an area of approximately 66ha and comprise of agricultural fields, grassland, small woodland and copses, farm

access tracks and irrigation ditches fed by the River Snail which runs along the western and northern boundaries of the Site (**Figure 1**).

- 1.3.7 The surrounding landscape comprises regularly shaped arable fields interspersed with managed hedgerows, tall shelter belts of trees and in the Chippenham Hall area, a parkland landscape with mature individual trees. Much of the area is also characterised by grazed paddocks, horse gallops and exercise tracks.

Cable route corridors

- 1.3.8 The Scheme will connect to the existing Burwell National Grid Substation via a cable route corridor. The cable route corridors under consideration are Grid Connection Route A, which connects the Sunnica East Site A with the Sunnica East Site B and then runs between the Sunnica West Site A and the Sunnica East Site B; and Grid Connection Route B, between the Sunnica West Site A and Sunnica West Site B and the Burwell National Grid Substation.

Grid Connection Route A

- 1.3.9 Grid Connection Route A connects the Sunnica East Site A with Sunnica East Site B and crosses two minor roads and arable farmland (**Figure 1**).

1.3.10 Heading south from the Sunnica East Site B, the cable route corridor for Grid Connection Route A crosses the River Kennett, pastoral farmland, the Chippenham footpath 49/7 (a Public Right of Way (PRoW)) and B1085 (**Figure 1**).

Grid Connection Route B

1.3.11 Heading east from the Burwell National Grid Substation, the cable route corridor for Grid Connection Route B crosses agricultural fields and a number of roads including the B1102 and A142. Grid Connection Route B also crosses a number of watercourses (e.g. ditches or rivers), including the Burwell Lode, New River, and the River Snail, as well as a number of drainage ditches associated with Burwell Fen, Little Fen, the Broads, and agricultural drains (**Figure 1**).

1.3.12 The cable route corridor for Grid Connection Route B crosses a PRoW (footpath 92/19) before crossing the railway line and the A142 Newmarket / Fordham Road. The Route then runs alongside Snailwell Road and across the River Snail into Sunnica West Site B.

Burwell National Grid Substation Extension

1.3.13 The habitat within the Burwell National Grid Substation Extension (surrounding the existing substation) comprises small grassland fields to the east of the existing substation (bordered by hedgerows and mature trees) and arable land to the south and west of the existing substation (**Figure 1**).

1.4 Scope of the report

1.4.1 The objective of the Great Crested Newt survey was to identify the presence or likely absence of this species within the survey area and to determine whether there are any potential impacts from the Scheme on Great Crested Newt.

1.4.2 This report includes the following information:

- a. relevant legislation and policy;
- b. methods for desk and field-based assessments (undertaken between 2018 and 2021);
- c. limitations to the surveys undertaken and any assumptions made as a result of incomplete data;
- d. survey results;
- e. the approach for determining the nature conservation importance of Great Crested Newt populations recorded during the assessments; and
- f. conclusions, recommendations and proposed mitigation.

1.4.3 This report is a technical appendix to accompany the Environmental Statement (ES) for the DCO application.

2 Great Crested Newt Ecology

2.1.1 Great Crested Newt is one of seven species of amphibian native to Britain and in common with other UK amphibians, they spend the majority of their lives on land, returning to standing water (water bodies and ditches) in the spring in order to breed.

2.2 Effect of temperature on activity

2.2.1 Great Crested Newts are ectothermic, meaning that they regulate their temperature through exchange of heat with the external environment. Gaseous exchange (oxygen/carbon dioxide) is achieved largely by absorption through their permeable skins, which must be moist for this purpose. Behaviour and activity are therefore strongly linked to external environmental conditions, especially daily and seasonal cycles. Great Crested Newts are mainly active at night (usually when temperatures exceed 5°C and following recent rainfall). With the onset of winter frosts, Great Crested Newts hibernate. Activity recommences when the frosts subside (which may be as early as January / February), with adults migrating to breeding water bodies. Peak breeding activity is usually between mid-March and mid-May.

2.3 Reproduction

2.3.1 Breeding takes place within water bodies with males performing a courtship 'dance' in order to attract and encourage females to take up a spermatophore (a packet containing sperm). Females deposit eggs (up to 200 per season) on the submerged leaves of aquatic broadleaved plants. Each egg is individually sealed for protection from predators within a folded leaf. Adults begin to leave the water bodies around May but may return in order to feed.

2.3.2 Larvae hatch after three weeks and feed on small aquatic invertebrates and the larvae/eggs of other amphibians for approximately three months. They metamorphose into land-adapted juveniles called efts and begin to emerge from their water bodies around August.

2.4 Habitat requirements

2.4.1 During their terrestrial phase, Great Crested Newts require a complex habitat structure in order to provide both food and shelter. These are most commonly provided by broadleaved woodland, rough or tussocky grassland and scrub habitats. They also require a secure area in which to hibernate. Hibernacula generally need to provide a stable temperature, be free from frost and provide protection from flooding and predation (a hibernaculum is a shelter occupied during the winter by a dormant animal). These requirements are commonly met by log/rubble piles, underground crevices or mammal burrows.

2.4.2 For breeding, Great Crested Newts require water bodies that provide suitable protection and food for their developing larvae. Generally, such water bodies should be of relatively good water quality so as to provide a diverse range of invertebrate prey. Unshaded water bodies tend to provide more of the required broadleaf aquatic vegetation, upon which great crested newt eggs can be laid. Water bodies with large fish populations (which can prey on newts) or heavy grazing pressure from waterfowl (which can prey on newts and reduce water

quality and egg laying habitat) tend not to support Great Crested Newt. Connectivity between water bodies and good quality terrestrial habitat tend to favour large, viable, populations of Great Crested Newt. In rural landscapes in Britain, such connectivity is often provided by the hedgerow network.

2.5 Great Crested Newt range

- 2.5.1 Great Crested Newts are thought to commonly move between water bodies up to a distance of 250m from each other, although there are studies showing Great Crested Newt travelling much further than this (Ref 2). The range of Great Crested Newt may be impacted by a range of factors, including the type and quality of habitat surrounding a breeding water body, the availability of hibernation sites and the presence or absence of barriers to dispersal (e.g. large and busy roads with no features that Great Crested Newt could move through).

3 Legislative and Policy Framework

3.1 Relevant legislative context

3.1.1 All stages of the Great Crested Newt life cycle as well as their habitat are fully protected under Schedule 2 of The Conservation of Habitats and Species Regulations 2017 (as amended) (Ref 3). Great Crested Newt is listed on Schedule 5 of the Wildlife & Countryside Act 1981 (Ref 4), which affords it protection under Section 9, as amended by the Countryside Rights of Way Act (2000) (Ref 5). It is also listed on Annex II and VI of the EC Habitats Directive (Ref 6), is included as a Species of Principal Importance in England under Section 41 of the Natural Environment and Rural Communities (NERC) Act 2006 (Ref 7) and is a UK Post-2010 Biodiversity Framework (Ref 8) species listed on the UK Biodiversity Action Plan. In combination, this makes it an offence to:

- a. deliberately capture, injure or kill a Great Crested Newt;
- b. deliberately take or destroy their eggs;
- c. deliberately, intentionally or recklessly disturb an individual; or
- d. damage, destroy or obstruct access to any structure which a Great Crested Newt uses for shelter or protection.

3.1.2 The protection includes both the breeding waterbody itself and the terrestrial habitat used for foraging and hibernation, which may be distant from the waterbody.

3.2 European protected species licencing

3.2.1 Where Great Crested Newt habitat, including their breeding sites and resting places, is present on a site and a development has the potential to cause one or more offences under The Conservation of Habitats and Species Regulations 2017 (as amended) (Ref 3), a European Protected Species Licence (EPSL) is required from Natural England to allow the development to proceed. This licence allows the development to proceed with exemption from offences, provided works are undertaken with strict accordance of the terms of the licence. A licence cannot, however, be obtained to provide protection against offences under the Wildlife and Countryside Act, 1981 (as amended) (Ref 4).

3.2.2 In determining whether to grant a licence, Natural England must apply the requirements of Regulation 535 of the Regulations (Ref 3), these being:

- a. Regulation 53(2)(e) states: “a licence can be granted for the purposes of “preserving public health or public safety or other imperative reasons of overriding public interest including those of a social or economic nature and beneficial consequences of primary importance for the environment”.
- b. Regulation 53(9)(a) states: “the appropriate authority shall not grant a licence unless they are satisfied “that there is no satisfactory alternative”.
- c. Regulation 53(9)(b) states: “the appropriate authority shall not grant a licence unless they are satisfied “that the action authorised will not be detrimental to the maintenance of the population of the species concerned at a favourable conservation status in their natural range.”

- 3.2.3 A determining authority must also apply these tests when determining a planning/DCO application, where a proposed development is likely to cause an offence under The Conservation of Habitats and Species Regulations 2017 (as amended) (Ref 3).
- 3.2.4 In order for a European Protected Species Licence to be approved by Natural England for works with Great Crested Newt, it must be demonstrated that the proposed development will minimise any potential impacts upon Great Crested Newt and will not be detrimental to the maintenance of the population of the species concerned at a favourable conservation status in their natural range.
- 3.2.5 Offences can be avoided through the implementation of appropriate mitigation that will minimise the potential for any offences to be committed. Mitigation can include the undertaking of vegetation clearance works at an appropriate time of the year and completing works in accordance with methods that will minimise or avoid potential disturbance or destruction of habitats. In such circumstances it is sensible for works to be completed using Reasonable Avoidance Measures (RAMs).

3.3 National and local planning policy

- 3.3.1 National and local planning policy relevant to nature conservation is provided in detail in the PEA report for the Scheme (Ref 1), which is also included as Appendix 8B of the ES [EN010106/APP/6.2].

3.4 Priority species

- 3.4.1 The NERC list of Species of Principal Importance (Ref 7) is used to guide decision-makers such as public bodies, including local and regional authorities, in implementing their duty under Section 40 of the NERC Act (2006); under Section 40 every public authority (e.g. a local authority or local planning authority) must, in exercising its functions, have regard, so far as is consistent with the proper exercise of those functions, to the purpose of conserving biodiversity.
- 3.4.2 In addition, with regard to those species on the list of Species of Principal Importance listed under Section 41, the Secretary of State must:
- “(a) take such steps as appear to the Secretary of State to be reasonably practicable to further the conservation of the living organisms and types of habitat included in any list published under this section, or
 - (b) promote the taking by others of such steps.”
- 3.4.3 The UK Biodiversity Action Plan (UKBAP) was launched in 1994 and established a framework and criteria for identifying species and habitat types of conservation concern. From this list, action plans for priority habitats and species of conservation concern were published and have subsequently been succeeded by the UK Post-2010 Biodiversity Framework (July 2012) (Ref 8). The UK Post 2010 Development Framework is relevant in the context of Section 40 of the NERC Act 2006, meaning that Priority Species and Habitats are material considerations in planning. These habitats and species are identified as those of conservation concern due to their rarity or a declining population trend.
- 3.4.4 Great Crested Newt was added to the UK Biodiversity Action Plan (UKBAP) as a priority species in September 2007 and subsequently was included as a Species

of Principal Importance in England under Section 41 of the NERC Act (2006) meaning that they are of material consideration in planning.

3.5 Local biodiversity action plan

- 3.5.1 The Scheme is located within two counties, Cambridgeshire and Suffolk. The Cambridgeshire and Peterborough Biodiversity Action Plan (Ref 9) and Suffolk Biodiversity Action Plan (Ref 10) provide the local nature conservation strategy for identifying threats to species within these counties and sets out the actions necessary to conserve them. These Biodiversity Action Plans provide context to inform identification of threatened and, or uncommon species within the district / county. The plans also identify priorities for conservation and enhancement but confers no particular legislative or policy protection to the species identified, however in some cases this is provided through related legislation and local planning policy.
- 3.5.2 Great Crested Newt is listed as Priority Species on both the Cambridgeshire and Peterborough Biodiversity Action Plan (Ref 9) and the Suffolk Biodiversity Action Plan (Ref 10).

4 Methods

4.1.1 This section describes the survey methods used to determine the status of Great Crested Newt within the survey area, which included:

- a. a desk study;
- b. a Habitat Suitability Index (HSI) survey;
- c. environmental DNA (eDNA) analysis; and
- d. presence or likely absence survey using field methods (a combination of bottle trapping, torching, egg-searching and, or netting).

4.2 Desk study

4.2.1 A desk study was undertaken in December 2018 through Cambridgeshire & Peterborough Environmental Records Centre (CPERC) and Suffolk Biodiversity Information Service (SBIS) to obtain records of Great Crested Newt within the preceding ten years and within a 2km radius of the Order limits.

4.2.2 Only records up to ten years old were considered within the assessment, as any records older than ten years are unlikely to be still representative of amphibian presence in the local area.

4.2.3 Aerial photographs and OS maps were reviewed as part of the PEA to identify water bodies of potential value to Great Crested Newt within 500m of the Order limits that were not separated by major barriers to Great Crested Newt dispersal (such as main roads and large rivers). The review of aerial photography and mapping included identifying any key routes of potential habitat connectivity to the Scheme from outside waterbodies (e.g. ponds) and significant barriers to Great Crested Newt dispersal (e.g. main roads or rivers).

4.3 Field survey

4.3.1 From the desk study, using maps and aerial photography, a total of 38 waterbodies or watercourses were identified within the survey area as needing to be assessed for their suitability to support Great Crested Newt (**Figure 2**).

4.3.2 The desk study scoped out the need for surveys on three waterbodies (15, 23 and 23a), owing to barriers to dispersal for Great Crested Newt and limited suitable connecting habitat between these waterbodies and the Scheme. Furthermore, waterbodies 17 and 18 were scoped out due to the distance between the waterbodies and the Scheme and limited suitable connecting habitats between the waterbodies and the Scheme (see also section 4.5.2).

Habitat Suitability Index (HSI)

4.3.3 The Habitat Suitability Index (HSI) is a measure of habitat suitability, developed by Oldham et al. (2000) (Ref 11) for evaluating the suitability of waterbodies and watercourses as habitat for Great Crested Newt. Ten habitat features of the waterbody or watercourse are assessed in the field and from these data a suitability index is calculated (**Table 4-1**). Waterbodies or watercourses with higher HSI scores are considered more likely to support Great Crested Newt than those with lower scores.

4.3.4 A value is recorded for each parameter and combined to determine an index of breeding suitability for Great Crested Newt (**Table 4-1**).

Table 4-1: Great Crested Newt suitability indices and description

Suitability Indices	Suitability Indices Title	Suitability indices Description
(SI1)	Geographic location	Different areas of the UK represent different indices scores
(SI2)	Water body area	The optimum water body size is between 500 and 750m ² .
(SI3)	Water body permanence	The optimal frequency of drying is one year per decade.
(SI4)	Water quality	The presence of indicator organisms (the same that are used to assess running water) is the water quality indicator.
(SI5)	Water body shading	Great crested newt occurrence is significantly reduced above a threshold of 75% shade.
(SI6)	Impact of waterfowl	Waterfowl impact on water body vegetation and water turbidity is a negative indicator for great crested newt.
(SI7)	Occurrence of fish	The effect of fish presence is related to the species. Some species can have negative impacts and Great Crested Newt hardly ever coexist with larger predatory fish species. Other species (depending on conditions) are not detrimental.
(SI8)	Water body density	Water body densities above four water bodies/km ² are taken as optimal.
(SI9)	Terrestrial habitat	In general, scrub, unimproved grassland, woodland (deciduous and coniferous) and gardens are regarded as being suitable terrestrial habitat, unlike improved pasture, arable and hardstanding. The SI9 is the combination between positive factors (suitable habitat) and negative factors (e.g. inherent in barriers to movement such as roads). The surrounding habitat is scored according to the extent of high-quality terrestrial newt habitat.
(SI10)	Macrophyte content	The highest occurrence of great crested newt is found in water bodies with emergent vegetation cover between 25% and 50% and submerged vegetation between 50% and 75%.

4.3.5 The HSI of a water body is a numerical index which scores ponds on a scale of between 0 and 1, using a geometric mean of the ten suitability indices, with the following suitability categories for the results:

- a. <0.5: poor likelihood of presence
- b. 0.5 – 0.59: below average likelihood of presence
- c. 0.6 – 0.69: average likelihood of presence
- d. 0.7 – 0.79: good likelihood of presence

e. >0.8: excellent likelihood of presence.

- 4.3.6 Any waterbody or watercourse with an HSI score of average or greater, should then be surveyed using eDNA analysis or field-based methods, to determine Great Crested Newt presence or likely absence.

eDNA laboratory analysis

- 4.3.7 Water samples were taken from ten waterbodies which were sent off for environmental DNA (eDNA) analysis. This method (eDNA analysis) was used to assess the presence or likely absence of Great Crested Newt DNA from a water sample. This new survey methodology is approved by Natural England and it provides evidence of presence or absence of Great Crested Newt (WC1067 Technical Advice Note (Biggs et al., 2014)) (Ref 12). Natural England has also issued their standing advice, which includes the recommended protocol for eDNA analysis (Gov.UK, 2015) (Ref 13). This requires water samples for eDNA to be taken between the 15 April and the 30 June.
- 4.3.8 Field surveys strictly followed the protocol set out in the WC1067 Technical Advice Note (Ref 12) and to prevent contamination of the samples:
- a. gloves were worn at all times during the sampling process, and gloves were replaced between sample collection from the waterbody and pipetting into the sterile sub-sample tubes; and
 - b. samples were collected without entering the water, i.e. the surveyor stood only on the waterbody bank or waterbody edges. This prevented disturbance of the substrate to limit cross-contamination.
- 4.3.9 The field sampling protocol consisted of the following steps for each surveyed waterbody or watercourse:
- a. The location of sub-samples was spaced as evenly as possible around the margin of the waterbody or watercourse. Subsamples generally targeted areas with potential egg laying substrate (e.g. vegetation) and open water areas which newts may be using for displaying. Prior to sampling, the water column was mixed by gently using a ladle to stir through the entire water column, whilst avoiding disturbing the sediment on the bed of the waterbody. Sampling of very shallow water (less than 5-10cm deep) was avoided where possible;
 - b. a new pair of gloves was put on to keep the next stage as uncontaminated as possible;
 - c. using a clear plastic pipette, approximately 15mL of water were taken from the bag and pipetted into six sterile tubes containing 35mL of ethanol to preserve the eDNA sample (i.e. the tube was filled to the 50mL mark);
 - d. the tube was shaken vigorously for ten seconds to mix the sample and preservative. This is essential to prevent DNA degradation and was also repeated for each of the six conical tubes. Before taking each sample, the water in the bag was shaken to homogenise the sample, as DNA material constantly sinks to the bottom; and
 - e. the box of preserved sub-samples was kept in a fridge and then later returned to ambient temperature in the laboratory for analysis.

- 4.3.10 Laboratory analysis was consistent with the methods described in Appendix 5 of the WC1067 Technical Advice Note (Ref 12), including control analysis for inhibition and degradation.
- 4.3.11 eDNA kits were procured from ADAS and on collection of samples, they were then sent back to ADAS to be analysed in their laboratory.

Great Crested Newt survey using field methods

- 4.3.12 Field methods were used on two ponds and one ditch to determine presence or likely absence of Great Crested Newt following Natural England recommendations (English Nature, 2001) (Ref 2):
- a. three methods (preferably torch surveys, bottle-trapping and egg searching) were used during each visit with netting as another technique which was be applied if one of the other techniques was not possible;
 - b. visits were undertaken in suitable weather conditions, i.e. warm, still evenings without rain;
 - c. four presence/absence surveys were undertaken and, if Great Crested Newts were confirmed as present, two additional visits (total of six visits) were made to estimate population class size; and
 - d. surveys were undertaken between mid-March and mid-June with at least two surveys in peak season (usually mid-April to mid-May) with three surveys carried out between mid-April to mid-May if Great Crested Newts was confirmed within the waterbody.
- 4.3.13 All surveys were undertaken by experienced Great Crested Newt surveyors who hold Natural England Class (WML-CL08) survey licences for Great Crested Newts, accompanied by unlicensed assistants.

Bottle trapping

- 4.3.14 Prior to sunset, bottle-traps were set at approximately one trap every 2 metres of water's edge, where practicable, in accordance with the Great Crested Newt mitigation guidance (Ref 2). Where access was restricted, due to vegetation overgrowth or other factors, this method was amended for the purposes of practicality and safety. The traps were left set overnight and were checked again the following morning, soon after sunrise. No trap was left set for longer than 11 hours. Any animals caught were identified, aged (juvenile / adult) and sexed and then released at the trap location.

Torch survey

- 4.3.15 Cluson torches, with 1-million candlepower, were used for the torch counts. Surveyors walked slowly around the water's edge after dark, looking for Great Crested Newt which would have emerged to begin courtship and feeding.

Egg searching

- 4.3.16 Aquatic and marginal vegetation (both living and dead vegetation) within the waterbodies and watercourses was searched for Great Crested Newt eggs. Once

an egg was found and confirmed as that of a Great Crested Newt, the search would be terminated to ensure that no damage or further disturbance to eggs would occur. Great Crested Newt eggs, like those of other newts, are typically laid within a folded leaf. In order to determine the species of newt egg found, the leaf must be unfolded, rendering it more prone to predation or damage. Numbers of eggs present are not indicative of population sizes.

Netting

- 4.3.17 If any of the methods above could not be conducted, netting was used. In order not to disturb sediment and adversely affect water clarity for torchlight surveys, netting was conducted after torchlight surveys. Netting was conducted with an Environment Agency approved 2mm mesh professional dipping net and was targeted at both open water and areas of suitable egg laying vegetation.

4.4 Population class assessment

- 4.4.1 If Great Crested Newt was found to be present during surveys, the results of the six survey visits were used to produce an approximate indication of the population size class. Based on the maximum count of adult Great Crested Newt, counted per water body per night, the Great Crested Newt population in each waterbody can be classified as small, medium or large, in line with the Great Crested Newt Mitigation Guidelines (English Nature, 2001) (Ref 2).
- 4.4.2 A population of Great Crested Newt is classified using the following indices:
- a. small: for maximum counts up to 10;
 - b. medium: for maximum counts between 11 and 100; and
 - c. large: for maximum counts over 100.

4.5 Assumptions and limitations

Desk study

- 4.5.1 The aim of a desk study was to help characterise the baseline context of the Scheme and provide valuable background information that would not be captured by a single site survey alone. Information obtained during the course of a desk study was dependent upon people and organisations having made and submitted records for the area of interest. As such, a lack of records for Great Crested Newt does not necessarily mean that this species does not occur in the study area. Likewise, the presence of records of Great Crested Newt does not automatically mean that these still occurred within the area of interest or were relevant in the context of the Scheme.

Field Survey

- 4.5.2 No surveys were undertaken on waterbodies 17 and 18 (see **Figure 2**), which are within 500m of Grid Connection Route B (between the Sunnica West Site B and National Grid Burwell Substation Extension). Both waterbodies are greater than 350m from the Scheme and as a general guide, Great Crested Newts are thought to commonly move between waterbodies up to a distance of 250m from each other, although there are studies showing Great Crested Newt travelling much further than this if there are areas of high quality foraging and refuge habitat.

Whilst the presence or absence of Great Crested Newt was not confirmed within these areas, the likelihood of Great Crested Newt presence in these waterbodies (based on the results of the desk study and field surveys on nearby waterbodies) is low. Waterbody 17 and 18 are both greater than 250m from the Scheme and the habitat between these waterbodies and the Scheme is intensively managed arable farmland, with very small areas of suitable terrestrial habitat for Great Crested Newt. Therefore, it is unlikely that Great Crested Newt are present in these waterbodies and the surrounding terrestrial habitat. Nevertheless, a precautionary approach will be undertaken in this area during construction and consideration of this will be taken forward when designing the mitigation for the construction of the Scheme in consideration of legal compliance to avoid killing or injuring any Great Crested Newt that may be present.

- 4.5.3 Surveys of the waterbody 27 and watercourse 27a (Sunnica West Site B), using traditional methods, were only undertaken once on 4 to 5 May 2020 (rather than four survey visits) as these areas were found to be dry on subsequent visits and hence unlikely to be suitable for supporting breeding Great Crested Newt.
- 4.5.4 Despite the limitations detailed above, sufficient information was gathered from the surveys to provide an assessment of Great Crested Newt presence within the survey area.

5 Results

5.1 Desk study

- 5.1.1 No records of Great Crested Newt were returned from the data search, within 2km of the Order limits. The closest record of Great Crested Newt to the Order limits was 2.1km from the Burwell National Grid Substation Extension, in 2013.
- 5.1.2 There are unverified reports from Worlington residents (close to Sunnica East Site B) of Great Crested Newt in garden ponds, adjacent to Waterbody 1. Water body 1 was subject to eDNA surveys for Great Crested Newt (see **Table 5-3**) and consideration for potential presence of Great Crested Newt in adjacent water bodies and water courses has been made further on in this appendix.

5.2 Field survey

Habitat Suitability Index

- 5.2.1 Of the 38 waterbodies and watercourses identified within the survey area (see **Figure 2**) the HSI surveys identified:
- no ponds with 'excellent' suitability for Great Crested Newt;
 - seven ponds with 'good' suitability for Great Crested Newt;
 - one pond with 'average' suitability for Great Crested Newt;
 - seven ponds with 'below average' suitability for Great Crested Newt; and
 - five ponds with 'poor' suitability for Great Crested Newt.
- 5.2.2 Five waterbodies were not surveyed due to their isolation from the Scheme and, or, the distance between the Scheme and each waterbody.
- 5.2.3 Furthermore, 13 waterbodies were visually inspected for their suitability for Great Crested Newt but were not fully surveyed using HSI methods. The rationale for this approach is provided in the supporting comments column of **Table 5-1**.
- 5.2.4 The results of the HSI survey are presented in Annex A, **Table A-1**.
- 5.2.5 A breakdown of the surveys undertaken within the survey area and the rationale for these are provided in **Table 5-1**.

Table 5-1: Summary of Great Crested Newt assessment undertaken for all waterbodies and watercourses, including reason for exclusion from any surveys

Waterbody or watercourse number (see Figure 2 for location)	Distance from Scheme (metres)	Closest Scheme area to waterbody	HSI Assessment carried out? (HSI score: 1 = excellent, 2 = good, 3= average, 4= below average, 5=poor)	eDNA analysis carried out? (Great Crested Newt - P = present; A = absent)	Field survey methods carried out? (Great Crested Newt - P = present; A = absent)	Supporting comments
1	152m	Sunnica East Site B	Yes (2)	Yes (P)	No	Great Crested Newt present from eDNA analysis. Great Crested Newt could also be present in connecting ditches (see section 6.1.5).
2	Within the Order limits	Sunnica East Site B	Full HSI assessment not required	No	No	Dry in 2019 and 2020 survey seasons and does not regularly hold water.
3	455m	Sunnica East Site B	Yes (5)	Yes (A)	No	-
4	13m	Sunnica East Site B	Yes (3)	Yes (A)	No	-
5	105m	Sunnica East Site B	Yes (5)	No	No	HSI poor for Great Crested Newt
6	252m	Sunnica East Site B	Full HSI assessment not required	No	No	Within working quarry - heavily disturbed and unlikely to support Great Crested Newt
7	Within the Order limits	Sunnica East Site B	Full HSI assessment not required	No	No	Agricultural reservoir, little to no vegetation and concrete or lined
8	248m	Grid Connection Route A	Yes (3)	-	-	HSI average for Great Crested Newt. Distance between Grid Connection Route A and this waterbody would ensure that no impacts to Great Crested Newt, if present in waterbody 8, will occur

Waterbody or watercourse number (see Figure 2 for location)	Distance from Scheme (metres)	Closest Scheme area to waterbody	HSI Assessment carried out? (HSI score: 1 = excellent, 2 = good, 3= average, 4= below average, 5=poor)	eDNA analysis carried out? (Great Crested Newt - P = present; A = absent)	Field survey methods carried out? (Great Crested Newt - P = present; A = absent)	Supporting comments
9	283m	Grid Connection Route A / Sunnica East Site B	Yes (2)	No	No	Greater than 250m from Grid Connection Route A and therefore no impacts to Great Crested Newt, if present in waterbody 9, will occur
10	133m	Sunnica West Site A	Yes (4)	No	Yes (A)	No Great Crested Newt recorded during surveys using traditional methods
11	9m	Grid Connection Route A / Sunnica West Site A	Full HSI assessment not required	No	No	Waterbody dry
11a	54m	Grid Connection Route A / Sunnica West Site A	Full HSI assessment not required	No	No	Waterbody dry
11b	63m	Grid Connection Route A / Sunnica West Site A	Full HSI assessment not required	No	No	Waterbody dry
11c	11m	Grid Connection Route A / Sunnica West Site A	Full HSI assessment not required	No	No	Waterbody dry
12	26m	Grid Connection Route A / Sunnica West Site A	Yes (2)	Yes (A)	No	-

Waterbody or watercourse number (see Figure 2 for location)	Distance from Scheme (metres)	Closest Scheme area to waterbody	HSI Assessment carried out? (HSI score: 1 = excellent, 2 = good, 3= average, 4= below average, 5=poor)	eDNA analysis carried out? (Great Crested Newt - P = present; A = absent)	Field survey methods carried out? (Great Crested Newt - P = present; A = absent)	Supporting comments
13	296m	Sunnica West Site A	Full HSI assessment not required	No	No	Agricultural reservoir, little to no vegetation
14	257m	Grid Connection Route B	Yes (2)	Yes (A)	No	-
15	274m	Grid Connection Route B	No	No	No	Scoped out during desk study. Isolated waterbody with barriers to dispersal between Scheme and this waterbody. Waterbody greater than 250m from the Grid Connection Route B
16	10m	Grid Connection Route B	Yes (2)	Yes (A)	-	-
17	352m	Grid Connection Route B	No	No	No	Approximately 350m from the Grid Connection Route, with barriers to dispersal (such as intensively managed arable farmland) between the waterbody and the Scheme. Therefore any impacts to Great Crested Newt, if present, will not occur
18	432m	Grid Connection Route B	No	No	No	Approximately 430m from the Grid Connection Route with barriers to dispersal (such as intensively managed arable farmland) between the waterbody and the Scheme. Therefore any impacts to Great Crested Newt, if present, will not occur

Waterbody or watercourse number (see Figure 2 for location)	Distance from Scheme (metres)	Closest Scheme area to waterbody	HSI Assessment carried out? (HSI score: 1 = excellent, 2 = good, 3= average, 4= below average, 5=poor)	eDNA analysis carried out? (Great Crested Newt - P = present; A = absent)	Field survey methods carried out? (Great Crested Newt - P = present; A = absent)	Supporting comments
19	8m	Grid Connection Route B	Yes (4)	No	No	-
20	11m	Sunnica East Site A	Full HSI assessment not required	No	No	Agricultural reservoir, little to no vegetation. Lots of waterfowl present, including Herons and Cormorants
21	16m	Sunnica East Site A	Full HSI assessment not required	No	No	Agricultural reservoir, little to no vegetation. Lots of waterfowl present, including Herons and Cormorants
21a	1m	Sunnica East Site A	Yes (4)	Yes (A)	No	-
22	11m	Grid Connection Route A	Yes (2)	Yes (A)	No	-
22a	294m	Grid Connection Route A	Yes (4)	-	-	HSI score below average. Close to Waterbody 22 with negative eDNA.
23	155m	Sunnica West Site A	No	No	No	Scoped out during desk study. Main roads which would act as a barrier to Great Crested Newt dispersal between Scheme and this waterbody
23a	155m	Sunnica West Site A	No	No	No	Scoped out during desk study. Main roads which would act as a barrier to Great Crested Newt dispersal between Scheme and this waterbody

Waterbody or watercourse number (see Figure 2 for location)	Distance from Scheme (metres)	Closest Scheme area to waterbody	HSI Assessment carried out? (HSI score: 1 = excellent, 2 = good, 3= average, 4= below average, 5=poor)	eDNA analysis carried out? (Great Crested Newt - P = present; A = absent)	Field survey methods carried out? (Great Crested Newt - P = present; A = absent)	Supporting comments
24	58m	Sunnica West Site A	Yes (5)	Yes (A)	No	-
25	Within the Order limits	Sunnica West Site A	Yes (2)	Yes (A)	No	-
25a	69m	Sunnica West Site A	Yes (4)	-	-	Pond surrounded by intensively managed farmland, HSI 'below average' for Great Crested Newt. Close to Waterbodies 24 and 25, both with negative eDNA
25b	6m	Sunnica West Site A	Full HSI assessment not required	No	No	Waterbody dry
25c	3m	Sunnica West Site A	Full HSI assessment not required	No	No	Waterbody dry
26	276m	Sunnica East Site B	Full HSI assessment not required	No	No	Reservoir, little to no vegetation
27	Within the Order limits	Sunnica West Site B	Yes (5)	No	Yes (A)	Waterbody dried out during season, after survey 1. HSI 'Poor' so unlikely to support Great Crested Newt
27a	Within the Order limits	Sunnica West Site B	Yes (5)	No	Yes (A)	Watercourses dried out during season, after survey 1. HSI 'Poor' so unlikely to support Great Crested Newt
28	30m	Grid Connection Route A	Yes (4)	No	No	Agricultural reservoir, little to no vegetation. Lots of waterfowl present, including Herons and Cormorants

Great Crested Newt survey using field methods

5.2.6 Surveys, using field methods, were undertaken on waterbody 10 (Sunnica West Site A), with four survey visits undertaken in May 2020 to determine Great Crested Newt presence or absence. The survey dates and weather conditions during surveys, are presented in **Table 5-2**.

5.2.7 Surveys, using field methods, were undertaken on a single waterbody and watercourse (27 and 27a) in the Sunnica West Site B. However, on the subsequent visits (from 9 May 2020), the waterbody and watercourse were found to be dry and no further surveys could be undertaken. The date of the survey and weather conditions are also presented in **Table 5-2**.

Table 5-2: Survey dates and weather conditions for each survey visit

Waterbody number / reference	Visit number	Survey Dates	Approximate Air Temp (°C) at time of Torching	Weather Conditions
10	1	4 May – 5 May 2020	10	Dry, wind F1 SW, cloud 2/8,
	2	9 – 10 May 2020	13	Dry, wind F2-3 E, cloud 3/8
	3	15 – 16 May 2020	10	Dry, wind F2-3 E, cloud 2/8
	4	28 – 29 May 2020	17	Dry, wind F1-2 E, cloud 1/8
27	1	4 May – 5 May 2020	10	Dry, wind F1 SW, cloud 2/8,
27a	1	4 May – 5 May 2020	10	Dry, wind F1 SW, cloud 2/8,

Notes on Table 5-2: Wind speed is shown using the Beaufort scale, which is an empirical measure of force 0-12 that relates wind speed to observed conditions. Cloud cover is shown in a scale of 0-8 where the number represents the amount of cloud cover e.g. 2/8 is 25% cover 4/8 is 50% etc.

5.2.8 No Great Crested Newt were recorded in any of the surveyed waterbodies and watercourses.

5.2.9 Smooth Newt *Lissotriton vulgaris* were found to be present in Waterbody 11, peaking at six animals on 4 to 5 May 2020.

eDNA analysis

5.2.10 Water samples were taken from nine waterbodies (see **Table 5-1**), with the lead ecologists undertaking the sampling being registered to hold a Natural England Great Crested Newt survey Class 1 licence and having appropriate training for eDNA sampling surveys. All samples taken were subsequently analysed by the ADAS Laboratory in Helsby.

5.2.11 The results of the eDNA surveys for Great Crested Newt are presented in **Table 5-3**.

Table 5-3: eDNA survey results

Waterbody and Watercourse Reference	Sample Date	eDNA Detection Results
1	23 June 2020	Positive
3	29 June 2020	Negative
4	23 June 2020	Negative
12	23 June 2020	Negative
14	23 June 2020	Negative
16	21 April 2021	Negative
21a	28 June 2019	Negative
22	23 June 2020	Negative
24	23 June 2020	Negative
25	23 June 2020	Negative

5.2.12 The results of the Great Crested Newt eDNA survey identified positive eDNA samples for Great Crested Newt in waterbody 1, which is approximately 150m from the Sunnica East Site B.

5.2.13 The HSI score of 0.76 for waterbody 1 indicated good suitability for the species. Apart from one other score of 0.76 (waterbody 12), this was the highest HSI score across all waterbodies and watercourses.

6 Conclusions

- 6.1.1 No Great Crested Newt were recorded within any of the waterbodies or watercourses surveyed within the Order limits during the Great Crested Newt surveys.
- 6.1.2 However, a positive Great Crested Newt eDNA sample was recorded from waterbody 1 (see **Figure 2**), which is approximately 150m from the Scheme.
- 6.1.3 The Scheme will not impact on waterbody 1, used by Great Crested Newt, as this waterbody is situated approximately 150m north of the Order limits. Furthermore, the developable areas of the Scheme (within the Order limits) are at a greater distance than 250m from this waterbody.
- 6.1.4 Connectivity between the Site and waterbody 1 is limited, with the surrounding 'moat' being dry at the time of survey (which would inhibit Great Crested Newt dispersal) and there were no other connecting watercourses or waterbodies between the Site and waterbody 1. Therefore, the meta-population of Great Crested Newt in waterbody 1 is isolated with limited dispersal routes.
- 6.1.5 The desk study identified unverified reports from Worlington residents of Great Crested Newt in garden ponds. There are a number of ditches on the southern side of Worlington, which if wet during early spring could be used by breeding Great Crested Newt. At their closest these waterbodies are approximately 70m from the Order limits.
- 6.1.6 Given the limited dispersal routes and no hydrological connections between waterbody 1 and the Site, it is highly unlikely that Great Crested Newt is present within the Order limits and this is further substantiated by the results of the surveys using field methods. However, a precautionary method of working will be adopted during construction of the Scheme within 250m of waterbody 1.

7 References

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- Ref 13. [REDACTED] (Accessed July 2020)

Annex 8A HSI scores

Table A-1: Habitat Suitability Index scores for waterbodies and watercourses assessed

Waterbody and Watercourse Reference (see Figure 2)	HSI Score
1	0.76
3	0.33
4	0.50
5	0.47
8	0.69
9	0.75
10	0.59
12	0.76
14	0.70
16	0.70
19	0.59
21a	0.51
22	0.70
22a	0.59
24	0.39
25	0.70
25a	0.59
27	0.35
27a	0.41
28	0.58

HSI Score colour coding – Dark green: Excellent likelihood of Great Crested Newt present; Light green – Good likelihood of Great Crested Newt present; Yellow – Average likelihood of Great Crested Newt present; Orange – Below average likelihood of Great Crested Newt present; and Red – Poor likelihood of Great Crested Newt present.

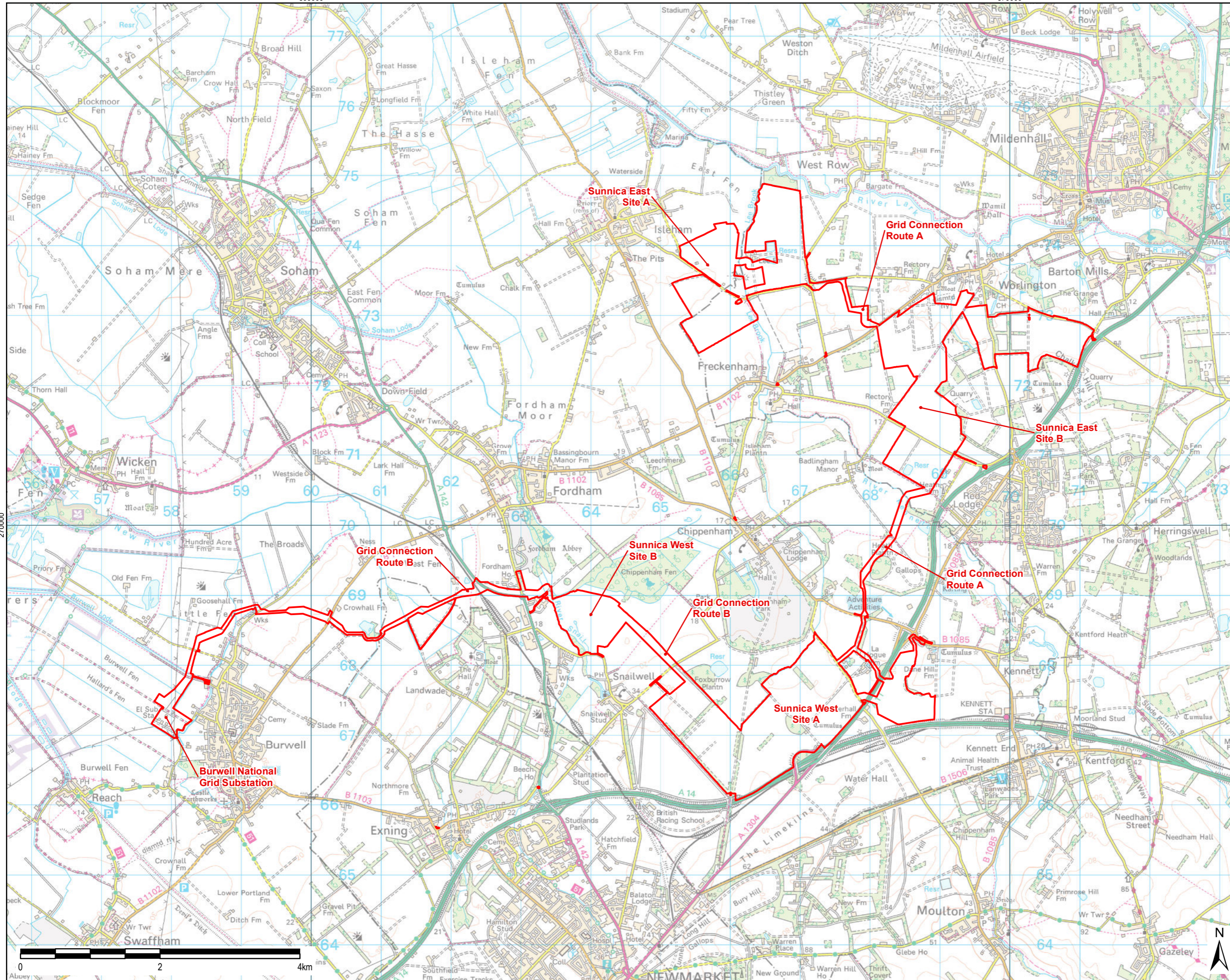
Annex 8B Figures

Figure 1 Order Limits boundary

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LEGEND

The Order Limits



Document Reference: EN010106/APP/6.3
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Drawing Title
FIGURE 1:
SITE LOCATION

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Figure 2 Great Crested Newt survey areas

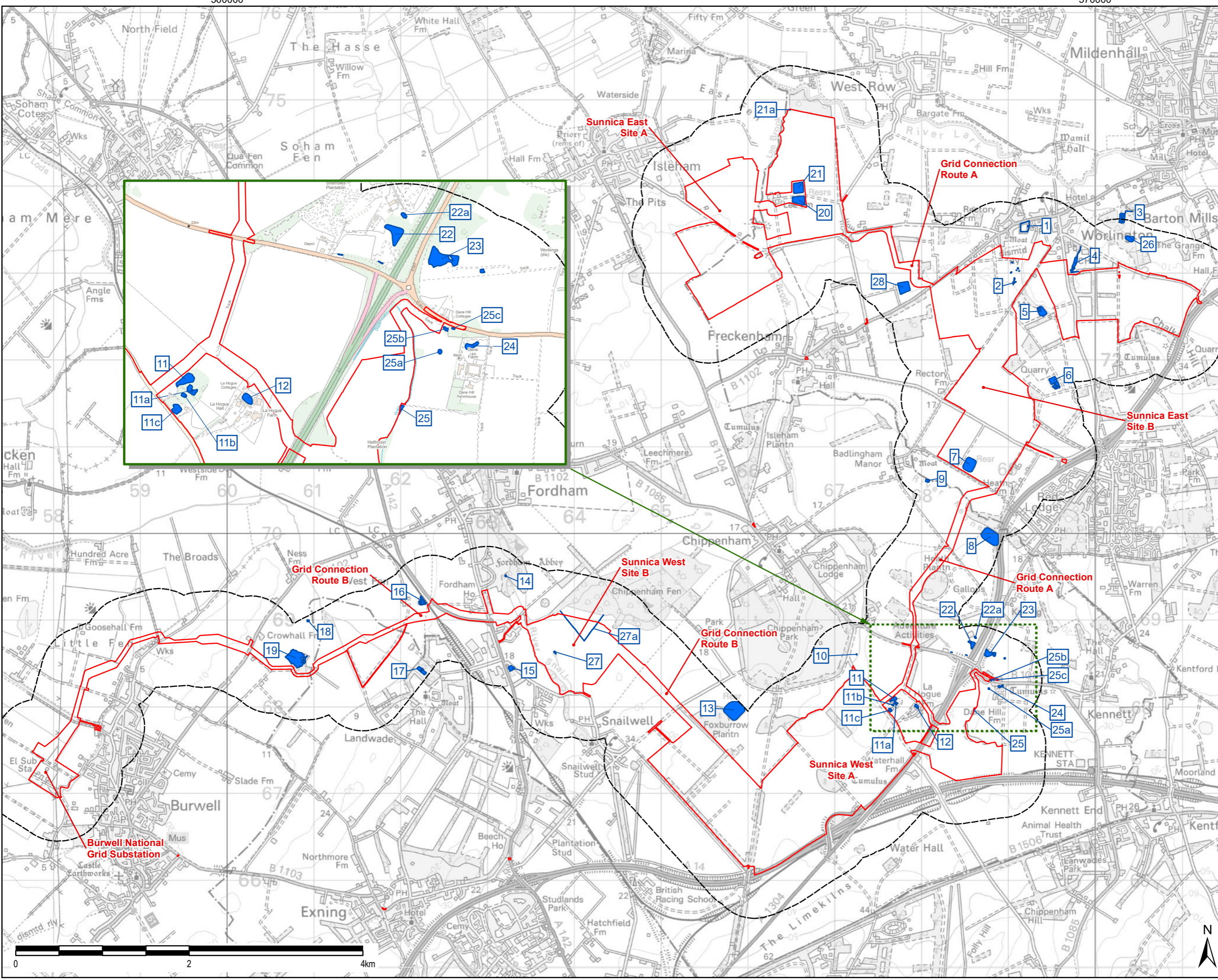
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LEGEND

- The Order Limits
- 500m scheme buffer
- Waterbodies surveyed for great crested newts

270000

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Drawing Title
FIGURE 2
GREAT CRESTED NEWT
SURVEY AREAS

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