



SUNNICA ENERGY FARM ENVIRONMENTAL IMPACT ASSESSMENT SCOPING REPORT

Sunnica Ltd

March 2019



Quality information

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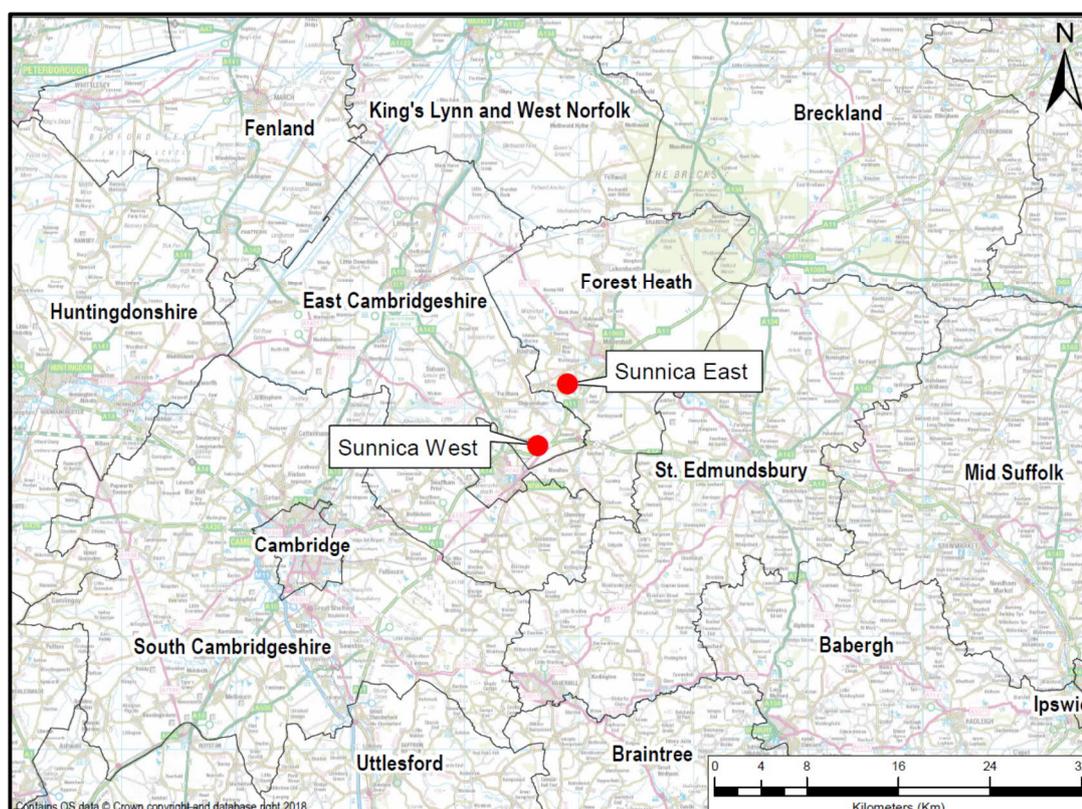
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1. Introduction

1.1 Background

- 1.1.1 Sunnica Ltd (hereafter referred to as 'the Applicant') has commissioned this Environmental Impact Assessment (EIA) Scoping Report for the Sunnica Energy Farm (hereafter referred to as the 'Scheme'). The Scheme comprises the installation of solar photovoltaic (PV) generating panels and on-site energy storage facilities across two proposed sites (hereafter referred to as the 'Sunnica East Site' and the 'Sunnica West Site'), within Suffolk and Cambridgeshire respectively, and associated infrastructure for connection to the national grid, including an extension to the Burwell National Grid Substation. The cable route corridor for 'Grid Connection Route A' is located between the Sunnica East Site and the Sunnica West Site, and for 'Grid Connection Route B', between the Sunnica West Site and the Burwell National Grid Substation Extension. The Scheme would allow for the generation, storage and export of up to 500 megawatts (MW) electrical generation capacity.
- 1.1.2 The Sunnica West Site is located approximately 4.5 kilometres (km) to the east of Burwell, and the Sunnica East Site is approximately 2.5km to the south-west of Mildenhall. The Scheme location is shown on Figure 1-1 below. The Sunnica East Site and Sunnica West Site locations, together with Grid Connection Route A and Grid Connection Route B, and the extension to the Burwell National Grid Substation are collectively referred to as the 'Scheme Boundary', as shown on Figure 1-2 and described in **Chapter 2: The Scheme**, of this Scoping Report. It is important to note that at this stage, Figure 1-2 shows the maximum extent of land that would be included within the DCO application and is likely to be refined as the Scheme design progresses, taking into account the findings of the ongoing environmental and technical assessments, and consultation responses.
- 1.1.3 This Scoping Report forms a formal request for a Scoping Opinion under Regulation 10(1) of the Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (as amended in 2018) (the 'EIA Regulations') (Ref. 1).

Figure 1-1 Scheme location



1.2 Legislative Context and Need for Environmental Impact Assessment

- 1.2.1 The Scheme is defined as a Nationally Significant Infrastructure Project (NSIP) under Section 14(1)(a) and 15(2) of the Planning Act 2008 (Ref. 2) as an onshore generating station in England, exceeding 50 MW. The development on each of the sites (Sunnica East Site and Sunnica West Site) is likely to constitute an NSIP in its own right but the sites will share a common grid connection and be covered by a single DCO application.
- 1.2.2 The EIA requirement for NSIP developments is transposed into law through the EIA Regulations (Ref. 1). The EIA Regulations specify which developments are required to undergo EIA and schemes relevant to the NSIP planning process are listed under either of 'Schedule 1' or 'Schedule 2'. Those developments listed in Schedule 1 must be subject to EIA, while developments listed in 'Schedule 2' must only be subjected to EIA if they are considered 'likely to have significant effects on the environment by virtue of factors such as its nature, size or location'. The criteria on which this judgement must be made are set out in Schedule 3.
- 1.2.3 The Scheme is a 'Schedule 2' development under Paragraph 3(a) of Schedule 2 of the EIA Regulations (Ref. 1) as it constitutes '*Industrial installations for the production of electricity, steam and hot water*'. The Applicant wishes to confirm under Regulation 8(1)(b) of the EIA Regulations that an Environmental Statement (ES) will be provided in respect of the application for development consent for the Scheme, as it is considered there is the potential for the Scheme to meet the criteria set out in Schedule 3 of the EIA Regulations (Ref. 1).
- 1.2.4 Following the completion of the surveys, assessments, and consultation processes outlined in this Scoping Report, an application for a Development Consent Order (DCO) will be made to the Secretary of State (SoS) for determination in accordance with the Planning Act 2008 (Ref. 2). The DCO application will be accompanied by an ES, in accordance with Regulation 5(2)(a) of the Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009 ('APFP Regulations') (Ref. 3). The ES will set out the methods and findings of a comprehensive EIA undertaken in line with the EIA Regulations (Ref. 1).
- 1.2.5 The Localism Act 2011 (Ref. 4) appointed the Planning Inspectorate as the agency responsible for operating the DCO process for NSIPs. The SoS will appoint an Examining Authority from the Planning Inspectorate, who will examine the application for the Scheme and then will make a recommendation to the SoS, who will make the decision on whether to grant or to refuse the DCO.
- 1.2.6 In accordance with Section 104(2) of the Planning Act 2008 (Ref. 2), the SoS is required to have regard to the relevant National Policy Statement (NPS), amongst other matters, when deciding whether or not to grant a DCO. Solar PV and battery storage are not currently covered by an NPS and therefore the DCO will be determined under Section 105 of the Planning Act 2008 (Ref. 2).
- 1.2.7 In lieu of a technology specific NPS, account will be taken of the following NPSs, which are relevant to the Scheme: Overarching NPS for Energy (EN1) (Ref. 5), NPS for Renewable Energy Infrastructure (EN-3) (Ref. 6), and NPS for Electricity Networks Infrastructure (EN-5) (Ref. 7). Given the importance of these NPSs, the EIA approach adopted takes account of these key policy documents. A summary of the relevant considerations for each technical assessment is provided for each environmental topic (Chapters 6 to 13 of this Scoping Report).
- 1.2.8 The SoS will also consider other important and relevant matters, including national and local planning policy. For example, the revised National Planning Policy Framework (NPPF) published in February 2019 (Ref. 8) is considered relevant national planning policy.

- 1.2.9 The local planning policy relevant to the Scheme consists of the following:
- East Cambridgeshire District Council Local Plan Adopted April 2015 (Ref. 9)¹;
 - East Cambridgeshire District Council Supplementary Planning Document (SPD) Renewable Energy Development (Commercial Scale) October 2014 (Ref. 11);
 - Forest Heath District Council Core Strategy Adopted 2010 (Ref. 12);
 - Forest Heath and St Edmundsbury Local Plan: Joint Development Management Policies Document (last updated February 2015) (Ref. 13);
 - Saved Policies (February 2015) of the Forest Heath Local Plan 1995 (Ref. 14);
 - Forest Heath Local Plan Policies Map February 2015 (Ref. 15);
 - Cambridgeshire and Peterborough Minerals and Waste Development Strategy (2011) (Ref. 16);
 - Cambridgeshire and Peterborough Minerals and Waste Site Specific Proposals Development Plan Document (2012) (Ref. 17);
 - Cambridgeshire and Peterborough Minerals and Waste Local Plan Preliminary Consultation Draft (May 2018) (Ref. 18);
 - Suffolk Minerals Core Strategy (2008) (Ref. 19);
 - Suffolk Minerals Specific Site Allocations (DPD) (2009) (Ref. 20); and
 - Suffolk Minerals and Waste Local Plan Submission Draft (June 2018) (Ref. 21).
- 1.2.10 The purpose of considering the above mentioned planning policy at the scoping stage of the EIA is twofold:
- a. To identify policy that could influence the sensitivity of receptors (and therefore the significance of effects) and any requirements for mitigation; and
 - b. To identify planning policy that could influence the methodology of the EIA. For example, a planning policy may require the assessment of a particular impact or the use of a particular methodology.
- 1.2.11 A summary of national and local planning policy relevant to each technical assessment is provided for each environmental topic.
- Purpose and Structure of the Scoping Report***
- 1.2.12 The EIA Regulations (Ref. 1) set out the requirements for an applicant who proposes to request a scoping opinion from the SoS. Regulation 10(3) of the EIA Regulations (Ref. 1) requires a Scoping Report to include:
- A plan sufficient to identify the land;
 - A description of the proposed development, including its location and technical capacity;
 - An explanation of the likely significant effects of the development on the environment; and
 - Such other information or representations as the person making the request may wish to provide or make.
- 1.2.13 The purpose of this EIA Scoping Report is therefore to:
- Provide a summary of the Scheme and alternatives considered to date;
 - Set out the proposed scope of work and methods to be applied in carrying out the EIA; and

¹ On 21 February 2019, East Cambridgeshire District Council formally withdrew the East Cambridgeshire District Council Local Plan Proposed Submission November 2017 (Ref. 10). Therefore, reference has not been made to this document within this Scoping Report. Planning policies from any subsequent submission will be taken into account during preparation of the ES.

- Set out the proposed structure and coverage of the ES to be submitted with the DCO application.

1.2.14 The Scoping Report is set out in accordance with guidance provided by the Planning Inspectorate's Advice Note 7 'Screening, Scoping and Preliminary Environmental information' (Ref. 22). Table 1-1 lists the suggested requirements identified in Advice Note 7 and details where they are presented in this Scoping Report. The requirements of the EIA Regulations (Ref. 1) regarding the content of the ES are also covered within the contents tabulated below.

Table 1-1 Contents for the Scoping Report based on Advice Note 7

<i>Suggested Scoping Report Contents</i>	<i>Location in this Scoping Report</i>
Transboundary Screening Matrix	Appendix A
<p>A plan showing:</p> <ul style="list-style-type: none"> • The proposed draft DCO site boundary (identified by a red line) including any associated development; • Any permanent land take required for the proposed development; • Any temporary land take required for construction, including construction compounds; • Any existing infrastructure which would be retained or upgraded for use as part of the proposed development and any existing infrastructure that would be removed; and • Features including planning constraints and designated areas on and around the sites such as national parks or historic landscapes. 	<p>Figure 1-1 (Scheme Location)</p> <p>Figure 1-2 (Scheme Boundary)</p> <p>Figure 2-1 (a-d)</p>
A description of the proposed development including both the NSIP and any associated development.	Chapter 2 (The Scheme)
<p>In dealing with the description of the proposed development and its possible effects on the environment, applicants should:</p> <ul style="list-style-type: none"> • Set out the information using the headings in Schedule 4 of the EIA Regulations; and • Ensure that all aspects of the environment likely to be significantly affected by the development are addressed. 	Chapter 2 (The Scheme) and Chapters 6 to 0 (Technical Topics)
An outline of the main alternatives considered and the reasons for selecting a preferred option.	Chapter 3 (Alternatives Considered)
Results of desktop and baseline studies where available.	Chapters 6 to 0 (Technical Topics)
Referenced plans presented at an appropriate scale to convey clearly the information and all known aspects associated with the proposal.	<p>Figure 1-2 (Scheme Boundary)</p> <p>Figure 2-1 (a-d)</p>
Any mitigation proposed and predicted residual effects.	Chapters 6 to 0 (Technical Topics)
Where cumulative development has been identified, how the developer intends to assess these impacts in the ES.	Chapter 5 (EIA Methodology), Section 5.6
An indication of any European designated nature conservation sites that are likely to be significantly affected by the proposed development and the nature of the likely significant impacts on these sites.	Chapter 8 (Ecology)

<i>Suggested Scoping Report Contents</i>	<i>Location in this Scoping Report</i>
Where a developer seeks to scope out a matter, a full justification for scoping out such matters, preferably supported by evidence of agreement with the relevant bodies.	Chapters 6 to 0 (Technical Topics)
Key topics covered as part of the developer’s scoping exercise.	Chapters 6 to 0 (Technical Topics)
An outline of the structure of the proposed ES.	Chapter 15 (Structure of the ES)

1.2.15 A glossary and abbreviation list is presented at the back of this report.

1.3 IEMA Quality Mark

1.3.1 AECOM is an IEMA Registered Impact Assessor and also holds the IEMA EIA Quality Mark as recognition of the quality of our EIA product and continuous training of our environmental consultants. A Statement of Competence will be included within the ES, outlining the relevant expertise or qualifications of the experts who prepared the ES.



2. The Scheme

2.1 Site Description

2.1.1 The Scheme comprises two sites (the Sunnica East Site and the Sunnica West Site), located within the administrative area of Forest Heath District Council and East Cambridgeshire District Council respectively, together with associated electrical infrastructure for connection to the national transmission system. The rationale for selecting the Sunnica East Site and the Sunnica West Site is described in **Chapter 3: Alternatives Considered**, of this Scoping Report. The maximum extent of land that could be included within the DCO application for the Sunnica East Site, Sunnica West Site, together with the maximum areas of the cable route corridors for Grid Connection Route A and Grid Connection Route B, and the maximum area required for the extension to the Burwell National Grid Substation is shown on Figure 1-2. Key environmental planning constraints are shown on Figure 2-1 at the end of this Scoping Report.

Sunnica East Site

2.1.2 The Sunnica East Site comprises five contiguous parcels of land (separated by minor roads). This Sunnica East Site is located 2.5km to the south-west of Mildenhall. The Sunnica East Site lies within the county of Suffolk, and in the Forest Heath District Council administrative area.

2.1.3 The landscape features within the Sunnica East Site consist of agricultural fields interspersed with individual trees, hedgerow, tree belts (linear) small woodland block, farm access tracks, and local transport roads (including the B1085). The hedgerows within the Sunnica East Site range between lengths of dense tall vegetation (shrub and tree species) and thin lines of vegetation with sporadic trees present, although the former is a dominant feature. A number of woodland blocks of varying sizes, noted as deciduous woodland, are located across the Sunnica East Site, notably including The Oaks, Summer House Plantation Swales Plantation, and Light Land Plantation. The arable fields are of small to moderate size, some of which are of irregular shape.

2.1.4 The landscape features immediately surrounding the Sunnica East Site comprise a number of small rural villages, including Worlington to the north, Barton Mills to the north-east, Red Lodge to the south, and Freckenham to the west. Industrial land uses adjoin the A11 to the south of the Sunnica East Site, for example associated with Bay Farm. A 7.5 MW capacity solar farm is situated adjacent to the south-eastern extent of the eastern parcel of the Sunnica East Site. An Anaerobic Digestion (AD) plant is located to the south of the Sunnica East Site, immediately east of Bay Farm, enabling the production of approximately 40 gigawatt (GW) hours of biogas per year.

2.1.5 Worlington Quarry is located within the south-eastern area of the Sunnica East Site, operated by Frimstone Ltd since its commencement in 2004. The quarry covers some 70 hectares of land accessed from Elms Road, approximately 700m north of the A11 Red Lodge junction. The site has been operational since planning permission was originally granted for the quarry in 2004, extracting sand and gravel and importing inert material for recycling and to utilise for the restoration of the site. The existing permitted duration of the quarry will take operation up to 30th October 2025, after which it will be restored in accordance with an approved restoration plan.

2.1.6 The local transport network comprises the A11 trunk road, adjoining the Sunnica East Site to the west and to the south, and local roads such as Elms Road (which bisects the central and western extents of the Sunnica East Site), Freckenham Road (which bisects the Sunnica East Site to the north-west), and Golf Links Road to the north-east. A non-designated route with public access runs between two land parcels at the western extent of the Sunnica East Site. No PRoW are situated within the boundary of the Sunnica East Site itself.

- 2.1.7 Within a 10km radius of the Sunnica East Site, there are a number of statutory designated nature conservation sites including Ramsar Sites, Special Areas of Conservation (SACs) and Special Protection Areas (SPAs). The nearest designated site is Red Lodge Heath Site of Special Scientific Interest (SSSI), located approximately 640m to the south-east of the Sunnica East Site. Chippenham Fen SSSI and National Nature Reserve (NNR), which forms part of the Fenland SAC and Chippenham Fen Ramsar, is located approximately 2.8km to the south-west of the Sunnica East Site, and Breckland SPA is located approximately 1.4km to the north-east of the Sunnica East Site. Cherry Hill and The Gallops, Barton Mills SSSI is located approximately 1.1km east of the Sunnica East Site. Badlingham Lane County Wildlife Site (CWS) and Worlington Heath CWS both fall within the northern section of the Sunnica East Site.
- 2.1.8 A Scheduled Monument (Reference 31091) is located at the eastern extent of the Sunnica East Site, known as 'Bowl barrow on Chalk Hill, 380m north west of Chalkhill Cottages'. Other Scheduled Monuments in the vicinity of the Sunnica East Site include the remains of Freckenham Castle (Reference SF 30), approximately 800m to the west.
- 2.1.9 A number of Grade II listed buildings are located in the vicinity of the Sunnica East Site, within Freckenham to the west, Worlington to the north and the hamlet of Badlingham to the north-east.
- 2.1.10 The Sunnica East Site is located predominantly within Flood Zone 1, with areas of Flood Zone 2 and Flood Zone 3 associated with the Lee Brook within the western extent, and also immediately to south, associated with the River Kennett.

Sunnica West Site

- 2.1.11 The Sunnica West Site is located approximately 4km east of Burwell. The Sunnica West Site lies within the county of Cambridgeshire, and in the East Cambridgeshire District Council administrative area.
- 2.1.12 As shown on Figure 1-2, it comprises two parcels of land to the north-west (referred to as 'Sunnica West Site (north)') and south-east (referred to as 'Sunnica West Site (south)') of Snailwell respectively, approximately 1km apart, separated by agricultural fields and Chippenham Road. The Sunnica West Site consists of agricultural fields bound by trees, managed hedgerows, tree shelter belts (linear), small woodland and copses, and farm access tracks. A straight tree-lined avenue bisects the Sunnica West Site (south) and forms part of a former carriageway to Chippenham Hall, which is located immediately to the north. This avenue is included on Historic England's 'Register of Historic Parks and Gardens of special historic interest in England' as part of the Chippenham Hall Grade II Registered Park and Garden (RPG). The southern boundary of the Sunnica West Site (south), adjacent to the A14 / A11, is formed by a post and rail fence and sporadic sparse vegetation. Sounds Plantation is a deciduous copse and is located towards the eastern extent of the Sunnica West Site (south). The arable fields are regular in pattern and moderate to large in scale.
- 2.1.13 The surrounding landscape comprises regular 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. The River Snail immediately adjoins the Sunnica West Site (north) to the west. Avenue planting is a characteristic of the immediate area, with mature trees present within the Sunnica West Site, and newer tree planting evident along the Chippenham Road, which is located between the two parcels of land. To the west of the Sunnica West Site (north), there is commercial and industrial land use, along the A142 (Newmarket Road / Fordham Road) and to the south of Snailwell Road. Much of the surrounding area of the Sunnica West Site is also characterised by grazed paddocks, horse gallops and exercise tracks, and the British Racing School is located to the south, beyond the A14, and the Horseracing Forensic Laboratory to the north-west.

- 2.1.14 The local transport network comprises the A14 and A11 trunk roads, and local roads such as Chippenham Road (between the two land parcels), the A142 (to the west), and B1085 (to the east). The A14/A11 junction (Junction 38 of the A14) is located immediately to the south-east of the Sunnica West Site boundary. The mainline railway line connecting Newmarket to Bury St Edmunds runs parallel to the A14, and the railway line connecting Newmarket to Ely runs in a north-west direction from Newmarket, approximately 600m to the south-west of the Sunnica West Site (north), at its closest point. Snailwell 5 bridleway (a Public Right of Way, 'PRoW') runs along the south-west boundary of the Sunnica West Site (south), and Snailwell 1 footpath PRoW crosses the land between the two land parcels. No PRoW are situated within the boundary of the Sunnica West Site itself.
- 2.1.15 Within a 10km radius of the Sunnica West Site, there are a number of statutory designated nature conservation sites including Ramsar Sites, SACs, SPAs and SSSIs. The Sunnica West Site (north) immediately adjoins Chippenham Fen Ramsar and NNR, Chippenham Fen and Snailwell Poor's Fen SSSI, Fenland SAC. Snailwell Meadows, is located directly to the south of the Sunnica West Site (north), separated by Snailwell Road. Newmarket Heath SSSI is located approximately 1.1km to the south of the Sunnica West Site (south), beyond the A14. Chippenham Avenue Fields CWS is located within the northern section of the Sunnica West Site (south).
- 2.1.16 A Scheduled Monument (Reference 27180) is found at the eastern extent of the Sunnica West Site (south), comprising four separate locations adjoining the A14 known as 'Four bowl barrows north of the A11/A14 junction, part of the Chippenham barrow cemetery'. The 'Roman villa S of Snailwell Fen' is located in the immediate vicinity of the Sunnica West Site (north), on the western side of the River Snail at the western extent of the Sunnica West Site (north). Other Scheduled Monuments in the vicinity of the Sunnica West Site (south) include 'The Rookery bowl barrow, part of the Chippenham barrow cemetery, 250m south of Waterhall Farm' and the 'Hilly Plantation bowl barrow, part of the Chippenham barrow cemetery, 500m south west of Waterhall Farm', both within 200m of the Sunnica West Site (south) to the south of the A14.
- 2.1.17 A Grade II Listed Building (Waterhall Farmhouse, Reference 1126383) is located on the southern side of the A14, approximately 100m south-east of the Sunnica West Site (south). The Grade II Listed Phantom Cottage (Reference 1126385) and Park Farmhouse (Reference 1162059) are located approximately 1km east of the northern extent of the Sunnica West Site (south).
- 2.1.18 As described above, the Sunnica West Site (south) is bisected by the avenue of the Chippenham Hall Grade II RPG, with Chippenham Hall itself being located immediately to the north. Also immediately to the north of the Sunnica West Site (south) is the Grade II* 'Lodges, Gateway and Railings to South of Park' Listed Building (Reference 1126376). A number of Grade II and II* Listed Buildings are also found in Snailwell, approximately 500m west of the Sunnica West Site (south).
- 2.1.19 The majority of the Sunnica West Site is located within Flood Zone 1². The Lee Brook adjoins the Sunnica West Site (south) to the north, and the north-eastern extent of the Sunnica West Site (south) comprises land within Flood Zone 2³ and Flood Zone 3⁴. Similarly, where the Sunnica West Site (north) adjoins the River Snail, at the north-western extent of the Sunnica West Site (north), the land comprises areas of Flood Zone 2 and Flood Zone 3.

² Flood Zone 1 - land assessed as having a less than 1 in 1,000 annual probability of river or sea flooding (<0.1%).

³ Flood Zone 2 - land assessed as having between a 1 in 100 and 1 in 1,000 annual probability of river flooding (1% – 0.1%).

⁴ Flood Zone 3 - land assessed as having a 1 in 100 or greater annual probability of river flooding (>1%).

Cable Route Corridors

- 2.1.20 The Scheme will connect to the existing Burwell National Grid Substation (400 kilovolt (kV) or 230kV substation). The cable route corridor (within which each of the connections will be located, as explained above in paragraph 2.1.1) for Grid Connection Route A, between the Sunnica West Site and the Sunnica East Site, and Grid Connection Route B, between the Sunnica West Site and the Burwell National Grid Substation, is shown on Figure 1-2. The electrical connection to the Sunnica West Site and Sunnica East Site will comprise underground cables and is described further in Section 2.4. For clarity, both connection routes are required. At this stage of the application process, search corridors have been defined for Grid Connection Routes A and B; these corridors will be evaluated in order to determine the most appropriate route.

Grid Connection Route A

- 2.1.21 Heading north from the Sunnica West Site, the cable route corridor for Grid Connection Route A crosses the B1085 before passing approximately 20m west of the Chippenham Gravel Pit CWS. The cable route corridor then crosses Chippenham footpath 49/7 (a PRoW) before crossing Havacre Meadows and Deal Nook CWS and the River Kennett before joining the Sunnica East Site.

Grid Connection Route B

- 2.1.22 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, 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. As such, the cable route corridor for Grid Connection Route B passes through multiple areas of Flood Zones 2 and 3. There are currently two route options for crossing the Burwell Lode to the north of Burwell, which will be discussed with the Environment Agency.
- 2.1.23 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, as shown on Figure 1-2. The location and type of crossing will be discussed with Network Rail and as shown on Figure 1-2, there are two route options under consideration. Depending upon the option selected, there are heritage designations in the vicinity including the Grade II Listed Biggen Stud Farmhouse and the Scheduled Monument 'Moated site E of church'. The cable route corridor then crosses the River Snail before entering the Sunnica West Site (north).
- 2.1.24 Grid Connection Route B connects Sunnica West Site (north) and Sunnica West Site (south). Between these land parcels, the cable route corridor crosses the Snailwell 1 footpath PRoW as well as Chippenham Road.

Burwell National Grid Substation Extension

- 2.1.25 The area identified for Burwell National Grid Substation Extension is currently an agricultural field, located to the west of the existing substation. The site lies within Flood Zones 2 and 3.

2.2 The DCO Scheme Boundary

- 2.2.1 The maximum area of land potentially required for the construction, operation and maintenance of the Scheme, which includes land required for permanent and temporary purposes, is shown on Figure 1-2. It is important to note that this may be subject to change, but Figure 1-2 shows the envisaged maximum extent of temporary and permanent land take. As discussed in Section 1.1, the land-take for the Sunnica East Site and Sunnica West Site, cable route corridors and the Burwell National Grid Substation Extension will be refined as the Scheme design progresses, taking into account environmental and technical factors, and consultation responses. At this stage of the process, there is no known existing infrastructure to be removed.

The Rochdale Envelope

- 2.2.2 The Planning Inspectorate's Advice Note 9: Using the 'Rochdale Envelope' ('Advice Note 9') (Ref. 23) provides guidance regarding the degree of flexibility that may be considered appropriate within an application for development consent under the Planning Act 2008 (Ref. 2). The advice note acknowledges that there may be aspects of the Scheme design that are not yet fixed, and therefore, it may be necessary for the EIA to assess likely worst case variations to ensure that all foreseeable significant environmental effects of the Scheme will be assessed.
- 2.2.3 The amount of flexibility required will depend upon the progress of the design at the stage that the detailed EIA work is undertaken. Certain aspects of the Scheme still require design flexibility.
- 2.2.4 It is therefore necessary for the technical assessments to assess an 'envelope' within which the works will take place. As such, the application and EIA will be based on maximum and, if relevant, minimum parameters or limits of deviation. To remain in accordance with the EIA Regulations, it will be essential that the parameters are as 'limited' as possible to ensure that the 'likely significant effects' are identified, rather than unrealistically amplified effects, which could be deemed to be unlikely. It is proposed to use the defined parameters for the Scheme in each relevant technical assessment, with each technical assessment defining their reasonable worst case basis of assessment.
- 2.2.5 The key elements of Advice Note 9 (Ref. 23) in relation to the Scheme are defined below:
- The application should acknowledge the need for details of a project to evolve, within clearly defined parameters;
 - The EIA should take account of the need for evolution within those parameters, and reflect the likely significance of such a flexible project in the ES;
 - Within those defined parameters, the level of detail of the proposals must be such as to enable a proper assessment of the likely significant environmental effects and the identification of mitigation measures, if necessary considering a range of possibilities: *"the assessment may conclude that a particular effect may fall within a fairly wide range. In assessing the 'likely' effects, it is entirely consistent with the objectives of the Directive to adopt a 'worst case' approach. Such an approach will then feed through into the mitigation measures envisaged. It is important that these should be adequate to deal with the worst case, to optimise the effects of the development on the environment"*; and
 - It is for the decision maker in granting consent, to impose conditions to ensure that the process of evolution keeps within the parameters applied for the assessed.

2.3 Description of the Scheme

Introduction

- 2.3.1 Solar PV and energy storage technologies are rapidly evolving. As a result, the parameters of the DCO will maintain flexibility to allow the latest technology to be utilised at the time of construction. This chapter provides information on the following:
- Solar and battery storage infrastructure (being the NSIPs located on the Sunnica East Site and Sunnica West Site);
 - Associated development (being development associated with the solar PV generating panels and energy storage facilities, including electricity export connection to National Grid and the Burwell National Grid Substation Extension);
 - Construction programme and activities;
 - Operational activities; and
 - Decommissioning.

Overview of Solar and Battery Storage Infrastructure

2.3.2 Both the Sunnica East Site and Sunnica West Site will consist of the same principal infrastructure as follows:

- Solar PV modules;
- PV module mounting structures;
- Inverters;
- Transformers;
- Switchgears (housed inside a building);
- Onsite cabling;
- One or more 'Battery Energy Storage System' (battery energy storage system) (expected to be formed of lithium ion batteries storing electrical energy);
- An electrical compound comprising a substation and control building;
- Fencing and security measures; and
- Access tracks.

2.3.3 During the construction phase, one or more temporary construction compound(s) will be required as well as temporary roadways to facilitate access to all land within the Scheme Boundary. Further information on construction activities is provided in Section 2.5.

2.3.4 In areas around the arrays and on other land within the Scheme Boundary, opportunities for landscaping, biodiversity enhancements and habitat management will be explored.

2.3.5 Two types of connection are currently under consideration: Alternating Current (AC) coupling connection and Direct Current (DC) coupling connection. Diagrams 2-1 and 2-2 illustrate the infrastructure required for each of these potential options. As the Scheme design develops, the connection type will be determined based upon environmental and technical factors. A reasonable worst case scenario will be assessed and presented in the ES.

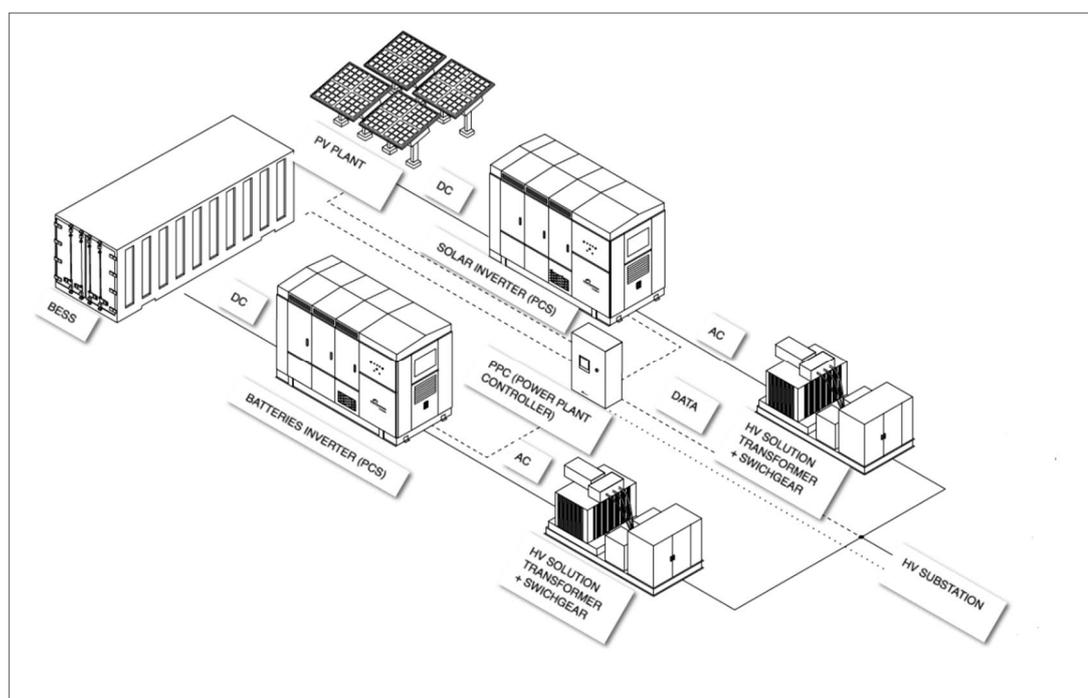


Diagram 2-1: Illustrative AC coupling connection diagram

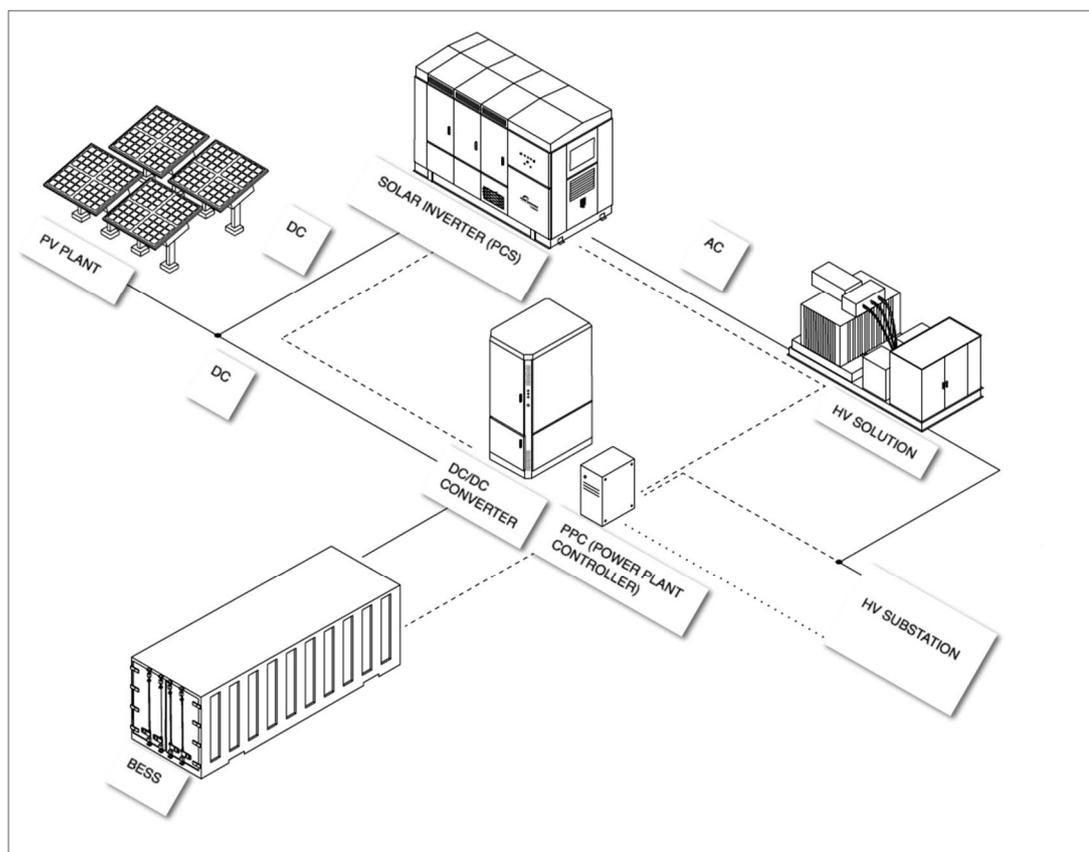


Diagram 2-2: Illustrative DC coupling connection diagram

Solar PV infrastructure

Solar PV modules

- 2.3.6 Solar PV modules convert sunlight into electrical current (as direct current, DC). Individual modules are typically up to 2m long and 1m wide and typically consist of a series of photovoltaic cells beneath a layer of toughened glass (as shown in Photos 2-1 and 2-2). Other PV technologies are developing rapidly and may be available at the time of construction. The module frame is typically built from anodised aluminium.
- 2.3.7 Each module could have a DC generating capacity of between 250 and 400 watts (W), or more depending on advances in technology at the time of construction. The modules are fixed to a mounting structure in groups known as ‘strings’. The number of modules which will make up each string is not yet known. Various factors will help to inform the number and arrangement of modules in each string, and it is likely some flexibility will be required to accommodate future technology developments.

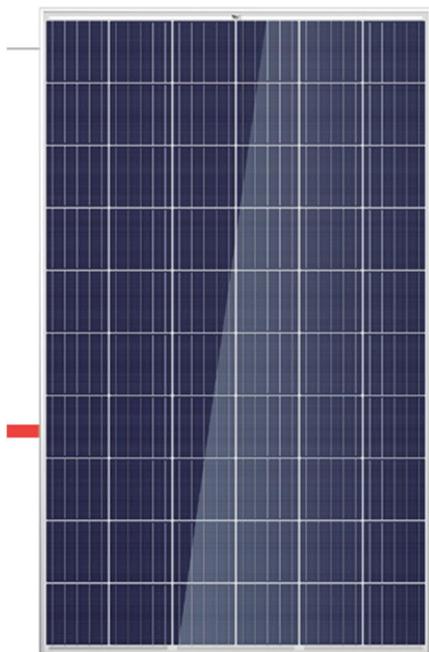


Photo 2-1: 60 cells solar panel

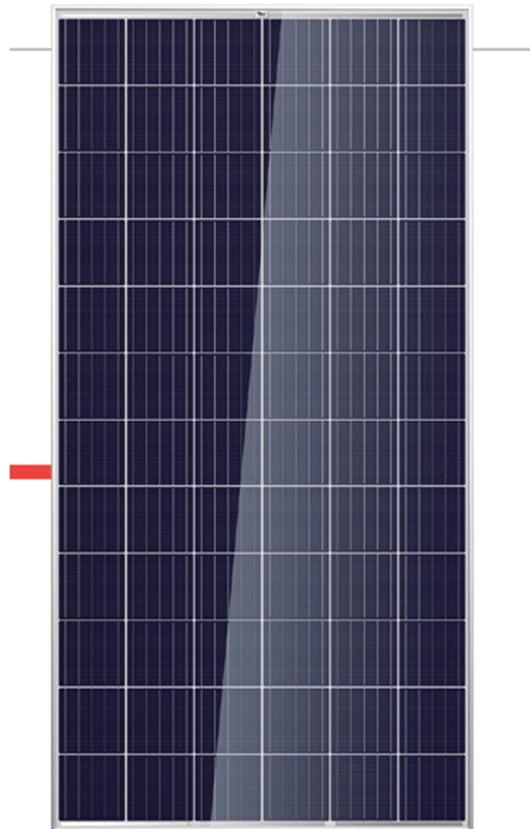


Photo 2-2: 72 cells solar panel

- 2.3.8 Two options for panel orientation are being considered at this stage. The first option is for the modules to face to the south, which is commonly seen on existing UK solar farms. With this configuration, the modules would be angled towards the south at a slope of 15 to 35 degrees from horizontal (see Photo 2-3). The second option is for modules to be oriented towards the east and west, which is less commonly seen on existing UK solar farms. With this configuration, the modules would be angled towards the east and west at a slope of 5 to 20 degrees from horizontal (see Photo 2-4). Where relevant, the EIA scoping study has considered the panel orientation which represents the worst-case scenario in terms of identifying potential environmental effects. For example, an east-west orientation will result in more Heavy Goods Vehicle (HGV) traffic movements since more panels are required (see Paragraph 2.5.9). As the Scheme design develops, the panel orientation will be determined based upon environmental and technical factors. A reasonable worst case scenario will be assessed and presented in the ES.

Module Mounting Structures

- 2.3.9 Each string of modules will be mounted on a metal rack. The number of strings that each rack will have is still to be determined; commonly, it is two. Racks are usually supported by galvanized steel poles driven into the ground. This is the most common solution on existing UK solar farms.
- 2.3.10 For a south facing configuration, between each row of racks, the separation distance will be approximately 2 to 11m, dependent upon angle of slope, to allow for appropriate maintenance.
- 2.3.11 For an east-west configuration, between each row of racks, the separation distance will be approximately 2.5 to 7m. The 'ridge' of each pair of strings could also include a separation distance of approximately 0.3m to 1m.

- 2.3.12 The modules are likely to be mounted on structures with a clearance above ground level (agl) of approximately 0.6 to 0.8m, and an upper height of up to 3.5m agl. These dimensions are indicative at this stage as the final elevations of the racks will be influenced by various design factors such as local topography and configuration.



Photo 2-3: Solar panels with south facing configuration



Photo 2-4: Solar panels with east-west facing configuration (*image reproduced courtesy of Huawei*)

Solar Stations (Inverter, transformer and switchgear)

- 2.3.13 A 'Solar Station' comprises an inverter, a transformer and the switchgears. Two options are under consideration, as described below. As the Scheme design develops, the configuration of the solar station will be determined based upon environmental and technical factors. A reasonable worst case scenario will be assessed and presented in the ES.

Option A: Solar station with independent outdoor equipment

- 2.3.14 As shown in Photo 2-5, with this option, the inverter, transformer, and switchgear are placed outdoors and independent of each other. The footprint for this solar station option is up to 20 x 4m in plan and up to 3.5m in height.



Photo 2-5: Option A – outdoor solar station

Option B: Indoor solar station in container

- 2.3.15 As shown in Photos 2-6 and 2-7, with this option, all equipment (inverter, transformer and switchgear) are included within a 40 foot ISO High Cube Container with a footprint of up to 14 x 4m in plan and a height of up to 3.5m. The container would be externally finished in keeping with the prevailing surrounding environment, often with a green painted finish.



Photo 2-6: Option B – indoor solar station exterior (image reproduced courtesy of Power Electronics)

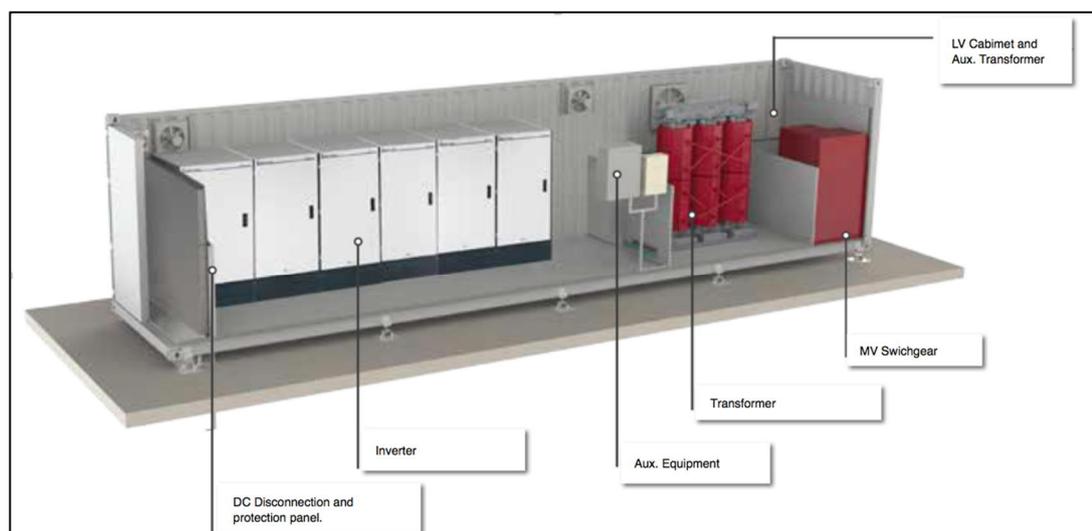


Photo 2-7: Option B – indoor solar station interior (image reproduced courtesy of Power Electronics)

2.3.16 The following sections describe inverters, transformers and switchgear in more detail. It is anticipated that plant would be installed on concrete bases.

Inverters

2.3.17 Inverters are required to convert the DC electricity collected by the PV modules into alternating current (AC), which allows the electricity generated to be exported to the National Grid. Inverters are sized to deal with the level of voltage and intensity, which is output from the strings of PV modules.

2.3.18 It is currently expected that centralised inverters will be used, and these could be sited at regular intervals amongst the PV modules. The inverters would be proprietary units up to approximately 5 x 3m in plan and 3.5m in height. This is the most common solution used on existing UK solar PV farms. As shown above in Photos 2-5 and 2-7, centralised inverters could be indoor or outdoor. Photo 2-8 shows an outdoor inverter as per Solar Station Option A.



Photo 2-8: Typical outdoor centralised inverter (as per Solar Station Option A)

- 2.3.19 Alternatively, string inverters could be used. One single string inverter unit would be utilised, for example, for every 10 to 12 strings. String inverters are small enough to be mounted underneath the modules, as shown on Photo 2-9. Although string inverters are under consideration at this stage, the EIA scoping study is based upon using centralised inverters as these represent the worst-case scenario in terms of identifying potential environmental effects since these will require more equipment to be transported to the Sunnica East Site and Sunnica West Site, will require concrete foundation and will be more visible.



Photo 2-9: Typical string inverter (image reproduced courtesy of Huawei)

Transformers

- 2.3.20 Transformers are required to control the voltage of the electricity generated across each of the Sunnica East Site and Sunnica West Site before it reaches the substation. Transformer cabins are therefore likely to be located across both the Sunnica East Site and Sunnica West Site at regular intervals. As shown in Photos 2-5 to 2-7, the transformers could be outdoor or indoor.
- 2.3.21 Photo 2-10 shows an example of an outdoor transformer (as per Solar Station Option A). The footprint could be around 4 x 3.5m in plan and 3.5m in height.



Photo 2-10: Typical outdoor transformer (as per Solar Station Option A)

- 2.3.22 Indoor transformers can be installed in a cabin, jointly with indoor switchgears, typically with a footprint of 7 x 4m in plan with a height of 3.5m, as shown in Photo 2-11. This is an alternative option that could be used within Solar Station Option A. Transformer cabins are typically externally finished in keeping with the prevailing surrounding environment, often with a green painted finish. Alternatively, as described above and shown on Photos 2-6 and 2-7, transformers can be installed in a high cube container together with an inverter and switchgear as part of an indoor solar station. As the Scheme design develops, the likely configuration of equipment will be determined based upon environmental and technical factors. A reasonable worst case scenario will be assessed and presented in the ES.



Photo 2-11: Typical transformer cabin (including switchgears) (alternative option for Solar Station Option A) (Image reproduced courtesy of Selma)

Switchgears

- 2.3.23 Switchgears are the combination of electrical disconnect switches, fuses or circuit breakers used to control, protect and isolate electrical equipment. Switchgear is used both to de-energise equipment to allow work to be done and to clear faults downstream.
- 2.3.24 Switchgears are usually indoor and can be located alone in a cabin (as shown on Photo 2-12), with a typical footprint of 3 x 3.5m in plan and 3.5m in height. As described in Paragraph 2.3.22 and shown on Photo 2-11, switchgears can be also located in a cabin together with the transformer with a typical footprint of 7 x 4m in plan and 3.5m in height. Alternatively, as described in Paragraph 2.3.15 and shown on Photos 2-6 and 2-7, switchgears can be placed in a high cube container, as part of an indoor solar station. As the Scheme design develops, the likely configuration of equipment will be determined based upon environmental and technical factors. A reasonable worst case scenario will be assessed and presented in the ES.



Photo 2-12: Typical cabin indoor switchgear used in the ‘outdoor solar station solution’ (as per Solar Station Option A)

Energy Storage Facility

- 2.3.25 The Scheme will include a battery energy storage system. The battery energy storage system is designed to provide peak generation and grid balancing services to the electricity grid by allowing excess electricity generated either from the solar PV panels, or imported from the electricity grid, to be stored in batteries and dispatched when required.
- 2.3.26 There are a number of different designs for the battery energy storage system that will be explored as part of the iterative design process. Maximum parameters for the compound layouts will be defined in the DCO application in order to present and assess a worst case in the EIA.
- 2.3.27 Batteries will be either in individual containers or housed within a larger building or buildings. The precise number of individual battery storage containers will depend upon the level of power capacity and duration of energy storage that the Scheme will require; investigations are ongoing to determine this. There needs to be an element of flexibility in this element as both the technology and business models are evolving, as is relevant policy which may affect the business case and support for the systems.
- 2.3.28 The location of the battery energy storage system, transformers, and dedicated switchgear on both the Sunnica East Site and Sunnica West Site will be determined in part by whether the battery energy storage system is AC-coupled or DC-coupled. If the system is AC-coupled they will be located together in one or more ‘centralised’ areas, which can be installed, operated and maintained easily. If the systems are DC-coupled they will be spread around both the Sunnica East Site and Sunnica West Site and located alongside the centralised inverters.

- 2.3.29 If the battery energy storage system is AC-coupled, it will need other electrical devices to import/export energy from the grid, including a battery inverter, transformer and switchgear, as shown in Diagram 2-1 and shown on Photo 2-13. These elements would be mounted on a concrete foundation as a single compound. The footprint will depend on the total capacity of battery storage of the system. As a worst-case scenario, the compound area would be around 200m x 120m on both the Sunnica East Site and Sunnica West Site, and several battery energy storage systems (as well as their associated battery inverter, transformer and switchgear) will be placed together. The single compound area would be placed close to the on-site substation.
- 2.3.30 If the battery energy storage system is DC-coupled, it will also need other electrical devices, including DC/DC converters, to import/export energy from the grid, as shown in Diagram 2-2. The battery energy storage system and DC/DC converters will be distributed around the Sunnica East Site and Sunnica West Site, located next to the solar stations. The footprint for each battery energy storage system would be up to 14 x 4m in plan and 3m in height, and the footprint of the DC/DC Converters would be up to 4 x 4m in plan, with a height of 3m.
- 2.3.31 Each battery energy storage system will require a heating, ventilation and cooling (HVAC) system to ensure the efficiency of the batteries, which are integrated into the containers. This may involve a HVAC system that is external to the containerised unit located either on the top of the unit or attached to the side of the unit. If this uses air to heat and cool it will have a fan built into it that is powered by auxiliary power.
- 2.3.32 The Switchgear/Control Room operates, isolates and controls the exported power from the energy storage system. This would comprise a building of similar dimensions to the containers; either an adapted container or built from glass reinforced plastic (GRP), located within main battery energy storage system compound.
- 2.3.33 As the Scheme design develops, the likely configuration of equipment will be determined based upon environmental and technical factors. A reasonable worst case scenario will be assessed and presented in the ES.



Photo 2-13: Typical battery storage compound configuration (*image reproduced courtesy of Fluence Energy*)

Onsite Cabling

- 2.3.34 Low voltage on-site electrical cabling is required to connect the PV modules and battery energy storage system(s) to inverters (typically via 1.5/1.8 kV cables), and the inverters to the transformers on-site (typically via 0.6/1 kV cables). The dimension of the trenches will vary depending on the number of ducts they contain but could be typically be up to 0.8m in width and 0.8 to 1.2m in depth.
- 2.3.35 Higher rated cables (around 33 kV) are then required between the transformers and the switchgears and from switchgears to the on-site substation. The dimension of the trenches will vary depending on the number of ducts they contain but could be typically up to 0.8m in width and up to 1.2m in depth.
- 2.3.36 Larger 132 kV cables are then likely to be required to export the electricity produced by the Sunnica East Site and Sunnica West Site to the Burwell National Grid Substation Extension (see Section 2.4).
- 2.3.37 Cabling between PV modules and the inverters will typically be required to be above ground level (along a row of racks), fixed to the mounting structure, and then underground (between racks and in the inverter's input). All other on-site cabling will be underground wherever possible.
- 2.3.38 Data cables will also be installed, typically alongside electrical cables in order to allow for the monitoring during operation, such as the collection of solar data from pyranometers.
- 2.3.39 The existing above-ground powerlines at the Sunnica West Site are not proposed to be altered by the Scheme.

On-Site Substation

- 2.3.40 The substation at both the Sunnica East Site and Sunnica West Site will consist of electrical infrastructure such as the transformers, switchgear and metering equipment required to facilitate the export of electricity from each respective site to the National Grid. The substation is also expected to include a control building, which would be up to 20 x 20m in plan, and up to 6m in height. This will include office space and welfare facilities as well as operational monitoring and maintenance equipment. The control building would be a painted block building with external colours and finishes to be confirmed prior to construction. The substation compound at each of the Sunnica East Site and Sunnica West Site would have a footprint of up to 150 x 100m in plan and up to 10m in height. These dimensions are highly dependent on the findings of further work and will be refined through the iterative design process. Maximum parameters for the compound will be defined in the DCO application, and a reasonable worst case scenario will be assessed and presented in the ES.

Fencing and Security

- 2.3.41 A security fence will enclose the operational areas of both the Sunnica East Site and Sunnica West Site. The fence is likely to be a 'deer fence', approximately 1.8 to 2.5m in height. Pole mounted internal facing closed circuit television (CCTV) systems are also likely to be deployed around the perimeter of the operational areas of each Site. It is anticipated that these would be 5m high. CCTV cameras would have fixed view sheds and will be aligned to face along the fence.



Photo 2-14: Typical deer security fence

- 2.3.42 To comply with British Standard (BS) EN 62271-1:2017 (Ref. 24), if outdoor transformers are used, they will be surrounded by a secure wire mesh fence, as shown in Photo 2-14. This fence is likely to be 1.8 to 2.5m in height.



Photo 2-15: Typical transformer compound fencing

- 2.3.43 It is likely that lighting sensors for security purposes will be deployed around the electrical infrastructure and potentially at other pieces of critical infrastructure. No areas are proposed to be continuously lit.

Site Access and Access Tracks

- 2.3.44 It is anticipated that operational access to the Sunnica East Site will be via the A11 and B1085 (Elms Road), utilising the existing access to Worlington Quarry. It is anticipated that operational access to the Sunnica West Site will be via road between the Chippenham junction of the A11, to the north of Junction 38 of the A14, and B1085 (Chippenham). Operational access will be confirmed as the Scheme design progresses and in consultation with Highways England and the County Highways Authorities.

- 2.3.45 Access tracks will be constructed across each of the Sunnica East Site and Sunnica West Site. These would typically be 3.5 to 5m wide compacted stone tracks with 1:2 gradient slopes on either side.

Surface water drainage

- 2.3.46 The detailed operational drainage design will be carried out pre-construction with the objective of ensuring that drainage of the land to the present level is maintained. It will follow either the design of a new drainage system taking into account the proposed new infrastructure (access tracks, cable trenches, structure foundations) to be constructed, or, if during the construction of any of the infrastructure, there is any interruption to existing schemes of land drainage, then new sections of drainage will be constructed.
- 2.3.47 The design of new drainage systems will be based on the Flood Risk Assessment (FRA) and hydrological assessment to be undertaken.
- 2.3.48 Infiltration drainage design will be in accordance with Building Research Establishment (BRE) Digest 365: Soakaway Design and Sewers for Adoption (Ref. 25) and infrastructure will be placed at least 10m away from watercourses.

2.4 Electricity Export Connection to National Grid

- 2.4.1 The electricity generated by the Scheme is expected to be imported and exported via interface cables from the on-site substations to the Burwell National Grid Substation. The cable corridor would be directed along highway verges or open countryside and require crossings of the railway, watercourses, various utilities, and roads.
- 2.4.2 The Burwell National Grid Substation is approximately 11km to the south-west of the Sunnica East Site and approximately 7km to the west of the Sunnica West Site. In order to connect the Sunnica East Site and the Sunnica West Site to the Burwell National Grid Substation, 132kV cables would be installed. The total length of the cable run for Grid Connection Route A would be approximately 6km, and 10km for Grid Connection Route B.
- 2.4.3 Up to three cable circuits may be required by the Scheme. Each circuit will be buried either in separate trenches or combined in a single wider trench. In terms of installation, the cables will be laid directly into the trenches, or ducting will be installed and the cables pulled through the ducting. The cables will be installed within a corridor, with an expected width of 20 to 30m (this includes both the permanent installation area and temporary working area) and a typical depth of up to 2m. Where the cable route encounters obstacles such as tree root systems, the width of the cable route (both permanent and temporary) may change locally.
- 2.4.4 Jointing pits will be required every 500m to 2000m to join sections of cable together. The dimensions of these are determined by how many circuits will be in the jointing pit. For three circuits, the dimensions of the jointing pit would be up to 19m x 5m. The distance between jointing pits will be determined through the design process and is dependent on existing infrastructure along the cable route, cable specification and cable delivery limitations.
- 2.4.5 The cable route will need to cross a range of existing infrastructure such as major roads, minor roads and tracks, existing buried/ underground utilities (such as medium and high pressure gas mains), a railway, river(s), field drains and main drains. As the precise cable route design is refined, the methods to be used for crossings will be selected. It is likely that open cut trenching will be primarily utilised, and Horizontal Directional Drilling (HDD) undertaken where this is not possible.
- 2.4.6 The cable route corridor for Grid Connection A and Grid Connection B, shown on Figure 1-2, is subject to an iterative design process. A range of constraints will determine the final optimal cable routing with a number of options being explored currently. These include: physical, ecological, cultural heritage and human interactions, technical engineering, legal and commercial considerations.

- 2.4.7 An extension to the Burwell National Grid Substation will be required, including a transformer compound to transform the 132kV export voltage from the Sunnica East Site and Sunnica West Site to the National Grid 400kV connection voltage. The substation extension compound would have a footprint of up to 150 x 75m in plan and 10m in height.

2.5 Construction Programme and Activities

Construction Programme

- 2.5.1 Subject to being granted consent and following a final investment decision, the earliest construction could start is Spring 2022, with planned operation by Spring 2025. Spring 2025 is the earliest date that the Scheme could be connected under the proposed agreement with National Grid.
- 2.5.2 It is anticipated that the Scheme could be either be built in phases over approximately 3 years, or constructed over a continuous period. At this stage, it is considered that a construction programme of approximately 15 months could be achieved if the Scheme was built in one continuous phase.
- 2.5.3 A reasonable worst case scenario for the construction programme will be assessed and presented in the ES. Further information on timescales and proposed assessment years is provided in Section 5.4.

Construction Activities

- 2.5.4 The ES will provide further details of the proposed construction activities, their anticipated duration, along with an indicative programme of each phase of the works. The sections below provide an overview of these activities.
- 2.5.5 The types of construction activities that may be required include (not necessarily in order):
- Site preparation:
 - Import of construction materials, plant and equipment to site;
 - The establishment of a construction compound(s);
 - Upgrading of existing site tracks / access roads and construction of new tracks;
 - The upgrade or construction of crossing points (bridges / culverts) over drainage ditches; and
 - Marking out the location of the infrastructure.
 - Energy farm construction:
 - Import of components to site;
 - Erection of module mounting structures;
 - Mounting of modules;
 - Installation of electric cabling;
 - Installation of transformer cabins;
 - Installation of battery storage units; and
 - Construction of substation compound.

- Cable installation:
 - The establishment of mobilisation areas and running tracks;
 - Temporary construction compounds (to be located within the cable route corridors shown on Figure 1-2);
 - Stripping of topsoil in sections;
 - Trenching in sections;
 - Appropriate storage and capping of soil;
 - Appropriate construction drainage with pumping where necessary;
 - Sectionalised approach of duct installation;
 - Excavation and installation of jointing pits;
 - Link box installation;
 - Cable pulling; and
 - Implementation of crossing methodologies for watercourses, infrastructure (including roads and rail), and sensitive habitats (e.g. HDD, cable bridging, etc.)
- Testing and commissioning.
- Site reinstatement and habitat creation.

Construction Site Access

- 2.5.6 It is anticipated that the main construction and decommissioning access to the Sunnica West Site will be via road between the Chippenham junction of the A11, to the north of Junction 38 of the A14, and B1085 (Chippenham). For the Sunnica East Site, it is anticipated that the main construction and decommissioning access will be via the A11 and B1085 (Elms Road), utilising the existing access to Worlington Quarry. It is proposed that any abnormal loads would use these main access points and a swept path analysis will be undertaken to determine if land take or road widening is required. It is anticipated that abnormal loads will be required for the transformers for the on-site substations and Burwell National Grid Substation Extension.
- 2.5.7 To minimise the construction of internal access roads, it is proposed to use the network of minor roads around the Sunnica East Site and Sunnica West Site for some deliveries, subject to suitability of these roads to carry HGVs. All construction and decommissioning access will be confirmed as the Scheme design progresses and in consultation with Highways England and the County Highways Authorities.
- 2.5.8 At this stage, it is anticipated that as a worst case during the peak construction period, there could be up to 42 HGV deliveries per day for the Sunnica East Site and 22 HGV deliveries per day for the Sunnica West Site. This is based upon an east-west configuration of panels (see Paragraph 2.3.8) over a 15 month construction programme (see Paragraph 2.5.2). There are anticipated to be up to six HGV deliveries per day for Grid Connection Route A and Grid Connection Route B. It is anticipated that as a worst case during the peak construction period, there could be up to two HGV deliveries for the Burwell National Grid Substation Extension. In addition, there will be Light Goods Vehicle (LGV) deliveries vehicle movements associated with construction worker arrivals and departures. Construction traffic predictions will be confirmed in the ES.

Construction Environmental Management

- 2.5.9 A Framework Construction Environmental Management Plan (CEMP) will accompany the DCO application, which will describe the framework of mitigation measures to be followed, to be carried forward to a detailed CEMP prior to construction. The aim of the CEMP is to reduce nuisance impacts from:
- Use of land for temporary laydown areas, accommodation, etc;
 - Construction traffic (including parking and access requirements) and changes to access and temporary road or footpath closure (if required);
 - Noise and vibration;
 - Utilities diversion;
 - Dust generation;
 - Soil removal; and
 - Waste generation.
- 2.5.10 The detailed CEMP will be produced by the appointed construction contractor following grant of the DCO and prior to the start of construction (for example, as part of a requirement attached to the DCO) and will identify the procedures to be adhered to and managed by the Principal Contractor throughout construction.
- 2.5.11 Contracts with companies involved in the construction works will incorporate environmental control, health and safety regulations, and current guidance and will ensure that construction activities are sustainable and that all contractors involved with the construction stages are committed to agreed best practice and meet all relevant environmental legislation including: Control of Pollution Act 1974 (COPA) (Ref. 24), Environment Act 1995 (Ref. 27), Hazardous Waste Regulations 2005 (as amended) (Ref. 28) and the Waste (England and Wales) Regulations 2011 (Ref. 29).
- 2.5.12 Records will be kept and updated regularly, ensuring that all waste transferred or disposed of has been correctly processed with evidence of signed Waste Transfer Notes (WTNs) that will be kept on-site for inspection whenever requested. Furthermore, all construction works will adhere to the Construction (Design and Management) Regulations 2015 (CDM) (Ref. 30).

Site Reinstatement and Habitat Creation

- 2.5.13 Following construction, a programme of site reinstatement and habitat creation will commence. A Framework Biodiversity and Landscape Management Plan will be submitted as part of the DCO application, and this document will set out the principles for how the land will be managed throughout the operational phase, following the completion of construction. A detailed Biodiversity and Landscape Management Plan will be produced following grant of the DCO and prior to the start of construction (for example, as part of a requirement attached to the DCO).

2.6 Operational Activities

- 2.6.1 During the operational phase, activity on the Sunnica East Site and Sunnica West Site will be minimal and would be restricted principally to vegetation management, equipment maintenance and servicing, replacement of any components that fail, and monitoring to ensure the continued effective operation of the Scheme. It is anticipated that there could be 10 to 20 visits per year with four wheel drive vehicles or transit vans. It is anticipated that there will be up to three permanent staff on-site during the operational phase.

2.7 Decommissioning

- 2.7.1 The design life of the Scheme is expected to be at least 40 years, although the operational life could be much longer than this; the condition of equipment will be reviewed at the end of the design life to determine whether it remains in a viable condition to continue operation after that time.
- 2.7.2 When the operational phase ends, the Sunnica East Site and Sunnica West Site will require decommissioning. All PV modules, mounting poles, cabling, inverters and transformers would be removed from the Sunnica East Site and Sunnica West Site and recycled or disposed of in accordance with good practice and market conditions at that time. The Sunnica East Site and Sunnica West Site will be returned to their original use after decommissioning. The future of the substation and control building would be agreed with the relevant Local Planning Authority prior to commencement of decommissioning. A Decommissioning Plan, to include timescales and transportation methods, would be agreed in advance with the relevant Local Planning Authority.
- 2.7.3 Decommissioning is expected to take between 12 and 24 months, and could be undertaken in phases.
- 2.7.4 The effects of decommissioning are often similar to, or of a lesser magnitude than, construction effects and will be considered in the relevant sections of the ES. However, there can be a high degree of uncertainty regarding decommissioning as engineering approaches and technologies evolve over the operational life of the Scheme, and assumptions will therefore be made, where appropriate.

3. Alternatives Considered

3.1 Introduction

- 3.1.1 Alternatives to the Scheme that have been considered include similar development at an alternative site, and alternative cable route corridors.
- 3.1.2 A 'no development' alternative would not deliver the additional electricity generation capacity associated with the Scheme and has therefore not been considered further. The ES will include a description of the alternatives relevant to the Scheme that have been considered, including their specific characteristics, and an indication of the main reasons for selecting the chosen option, including a comparison of the environmental effects. This will include alternative site layouts, which will be considered during the design process. A full detailed appraisal of the options considered will be presented as part of the ES, discussing the rationale for the final site layout and design selection, as well as explaining the flexibility sought within the consent in this regard.

3.2 Site Selection

- 3.2.1 The process to select the Sunnica East Site and Sunnica West Site followed a systematic step-by-step process to ensure that the identification and evaluation of alternatives has been completed.
- 3.2.2 The starting point was an analysis of the key elements that the Scheme needs to be feasible including:
1. Proximity to the transmission network with available capacity at a point that can be reinforced economically;
 2. Suitability from both the planning and engineering perspective; and
 3. Availability of land.
- 3.2.3 The evaluation process explored the full range of possible alternatives at national, regional and local perspectives following where possible pre-existing methodologies for alternatives and sequential test analysis. Full details of the site selection process will be presented in the ES.
- 3.2.4 Further refinement will be undertaken as the Scheme design progresses to determine the DCO application boundaries and site layout for the Sunnica East Site and the Sunnica West Site submitted with the DCO application.

3.3 Alternative Cable Route Corridors

- 3.3.1 An extensive optioneering process has been undertaken to identify the cable route corridors for Grid Connection Route A and Grid Connection Route B, shown on Figure 1-2. Three cable route corridor options were evaluated, taking into consideration technical and engineering challenges, planning and environmental constraints, and land ownership. From the three potential routes, a preferred cable route corridor has been selected and will be refined as the Scheme design develops. The cable route corridor crosses predominantly agricultural land, where possible keeping to field boundaries and avoiding sensitive ecological areas such as mature trees and hedges. Full details of the cable route corridor selection process will be presented in the ES.

4. Consultation

4.1 Context

- 4.1.1 Effective stakeholder engagement and consultation is intrinsic to the Planning Act 2008 (Ref. 2) and fundamental to the success of the Scheme.
- 4.1.2 The process of consultation is critical to the development of a comprehensive and balanced ES. The views of statutory and non-statutory consultees serve to focus the environmental studies and to identify specific issues that require further investigation. Consultation is an ongoing process, which enables mitigation measures to be incorporated into the project design thereby limiting adverse effects and enhancing environmental benefits.
- 4.1.3 The Scheme has a wide range of stakeholders (including landowners, statutory consultees, local communities and specialist interest groups) with differing interests that will require varied levels of consultation. Specific communication activities therefore need to be focussed to meet the needs of particular individuals and groups. This requires an understanding of the stakeholders and their interests in the Scheme.
- 4.1.4 Stakeholder engagement for the Scheme is based on the following principles:
- Early and ongoing engagement to inform and influence the design process;
 - Seeking an appropriate level of feedback in the iterative design process and ensuring that comments received are taken into consideration;
 - Building of long term relationships with key stakeholders throughout the different stages of the Scheme to help better understand their views;
 - Where possible and practicable ensuring concerns are addressed; and
 - Ensuring appropriate statutory consultation is undertaken in compliance with requirements of the Planning Act 2008 (Ref. 2), EIA Regulations (Ref. 1) and associated guidance.

4.2 DCO Consultation Requirements

- 4.2.1 The DCO process has a number of statutory requirements regarding consultation. These requirements stipulate that certain stakeholder groups and the community must be consulted as part of the pre-application process, as set out in Sections 42, 47 and 48 of the Planning Act 2008 (Ref. 2) and Regulation 13 of the EIA Regulations (Ref. 1). Further requirements set out how the Scheme must be publicised and specific documents produced, including a Statement of Community Consultation (SoCC), Preliminary Environmental Information Report (PEIR) and a Consultation Report.

4.3 Consultation to Date

- 4.3.1 A number of meetings with statutory consultees have already taken place to provide an introduction to the proposals, including:
- The Planning Inspectorate;
 - East Cambridgeshire District Council;
 - Highways England;
 - Historic England;
 - Natural England; and
 - Suffolk County Council.

4.3.2 The Applicant has also spoken directly to Cambridgeshire County Council, Forest Heath District Council and the Environment Agency and meetings will be set up with these stakeholders shortly, as well as with Suffolk Wildlife Trust, Bedfordshire, Cambridgeshire and Northamptonshire Wildlife Trust, the Swaffham Internal Drainage Board and the Gardens Trust.

4.3.3 In addition, a project website has been set up to provide up to date information on the project: www.sunnica.co.uk, and information has been provided to local residents and local community groups in advance of the submission of this Scoping Report.

4.4 Scoping Consultation

4.4.1 The Planning Inspectorate (on behalf of the SoS) will consult on this Scoping Report under the EIA Regulations. Views from consultees will be considered and used to inform the Scoping Opinion to be issued by the Planning Inspectorate.

4.4.2 Under Regulation 10(6) of the EIA Regulations (Ref. 1), the SoS must undertake consultation with statutory consultation bodies, including environmental bodies (such as Natural England, the Environment Agency and Historic England) and relevant planning authorities (East Cambridgeshire District Council, Forest Heath District Council, Cambridgeshire County Council and Suffolk County Council), before adopting a Scoping Opinion.

4.5 Public Statutory Consultation

4.5.1 In accordance with Section 47(1) of the Planning Act 2008 (Ref. 2) for an NSIP, the Applicant will prepare a SoCC for publication in Autumn 2019. This will outline how the Applicant intends to consult with the local community about the Scheme, including, in accordance with Regulation 12 of the EIA Regulations (Ref. 1), how it intends to publicise and consult on the Preliminary Environmental Information (PEI). The Applicant is required to consult the host local authorities (i.e. those local authorities whose administrative area the Scheme is located within) on the draft SoCC and they will have a period of at least 28 days following receipt of the request to comment on a draft SoCC prior to its publication for inspection by the public.

4.5.2 A two stage approach to consultation with the local community and wider public is planned, as follows:

- A first round of non-statutory events in Summer 2019 to introduce the Scheme and present a preliminary design and the options currently under consideration; and
- A second round of events in late 2019, being the statutory consultation pursuant to the Planning Act 2008 (Ref. 2) and EIA Regulations (Ref. 1), including consultation on the Preliminary Environmental Information. The PEI Report will report the outcomes of the preliminary assessment of likely significant environmental effects, to allow consultees to develop an informed view of the Scheme. The full EIA will not have been completed by that time, and it is likely the PEI Report will not include certain surveys and assessments that are not possible at that time of year, such as protected species surveys that have seasonal restrictions. It is anticipated that a 'chosen' design will be presented based on a consideration of the feedback from the first round of events. Members of the public will be given an opportunity to comment on the chosen technology and design before proposals are 'fixed' for the DCO application and the ES is finalised.

4.5.3 The approach to public consultation is currently being finalised, but is likely to include (without being limited to):

- Exchanges of correspondence, meetings and workshops with local community groups and businesses; and
- Public exhibitions at which members of the community can meet with members of the project team and online.

- 4.5.4 During the statutory consultation, consultation will also be undertaken with prescribed consultation bodies as well as affected landowners, in accordance with Sections 42 and 48 of the Planning Act 2008 (Ref. 2) and Regulation 13 of the EIA Regulations (Ref. 1).
- 4.5.5 All responses received during consultation will be carefully considered and taken into account in the development of the Scheme in accordance with Section 49 of the Planning Act 2008 (Ref. 2). Details of any responses received during consultation and the account taken of those responses will be included in a Consultation Report. This Consultation Report will be submitted with the application for a DCO to the SoS and, if the application is accepted, will be available for public review.
- 4.5.6 The Consultation Report will demonstrate how the Applicant has complied with the consultation requirements of the Planning Act 2008 (Ref. 2) and EIA Regulations (Ref. 1) and will be considered by the SoS when determining whether to accept the application, and then in examining the application.

5. Environmental Impact Assessment Methodology

5.1 Introduction

5.1.1 The ES will be based on a number of related activities, as follows:

- Establishing existing baseline conditions;
- Consultation with statutory and non-statutory consultees throughout the DCO application process;
- Consideration of relevant local, regional and national planning policies, guidelines and legislation relevant to EIA;
- Consideration of technical standards for the development of significance criteria;
- Review of secondary information, previous environmental studies and publicly-available information and databases;
- Desk-top studies;
- Physical surveys and monitoring;
- Computer modelling (where required); and
- Expert opinion.

5.1.2 The ES will set out the process followed during the EIA including the methods used for the collection of data and for the identification and assessment of impacts. Any assumptions made will be clearly identified.

5.1.3 The EIA process is designed to be capable of, and sensitive to, changes that occur as a result of design development, including any mitigation measures that are incorporated during the EIA. This will be particularly important for this EIA as the design and layout of the Scheme is still being refined, and changes are likely to be made following submission of this EIA Scoping Report. It is not, however, anticipated that the Scheme that is the subject of the EIA and DCO application will be materially different from the Scheme that is the subject of this Scoping Report, and it will be within the parameters / options set out in **Chapter 2: The Scheme**, of this Scoping Report.

5.1.4 Impacts will be considered on the basis of their magnitude, duration, and reversibility. Cumulative and combined effects will also be considered where appropriate. Significance will be evaluated on the basis of the scale of the impact and the importance or sensitivity of the receptors, in accordance with standard assessment methodologies. More information on the assessment methodology is provided in Section 5.5 below.

5.1.5 Where potentially significant adverse environmental effects are identified in the assessment process, measures to mitigate these effects will be put forward in the form of recommendations to be undertaken as part of the project development as far as practicable.

5.2 Determining the Baseline Conditions

5.2.1 In order to predict the potential environmental effects of the Scheme, it will be necessary to determine the environmental conditions that currently exist within the DCO boundary and surrounding area, in the absence of any development. These are known as 'baseline conditions'.

5.2.2 Detailed, environmental baseline information will be collected and the methodology for the collection process will be detailed within the ES. The baseline information will be gathered from various sources, including:

- online/digital resources;
- data searches, e.g. GroundSure, Historic Environment Record, etc.;
- baseline site surveys; and
- environmental information submitted in support of other planning applications for developments in the vicinity.

5.2.3 Consideration will also be given to how the baseline conditions would evolve in the absence of the Scheme, known as the 'future baseline'. The Sunnica East Site includes a working quarry and the future baseline will assume that the site has been restored in accordance with the extant mineral consent (planning refs: SCC0107174 and SCC013217F). This restoration comprises the infilling of the quarry with inert material, top soil replacement and a five year period of aftercare to ensure that land is returned to a condition suitable for arable agriculture. Wetland habitat creation is proposed in the northern areas of the quarry.

5.3 Embedded Measures

5.3.1 Measures will be identified in order to avoid, reduce and, if possible, offset significant adverse effects identified during the EIA process. Where possible, these measures will be incorporated into the form or design of the Scheme.

5.3.2 Once these measures are incorporated into the design, they are termed 'embedded measures'. Embedded measures relevant to the construction phase will be described within a Framework CEMP, and within the 'Environmental Design and Management' section of each technical chapter. For the operational phase, such embedded measures will be represented primarily in the design. Embedded measures are therefore either incorporated into the design from the outset or identified through the assessment process.

5.3.3 The ES assesses effects with embedded measures in place. Where significant adverse effects are identified after considering these embedded measures, 'additional mitigation measures' are proposed.

5.4 Timescales and Assessment Years

Construction Phase Effects

5.4.1 For the assessment, these effects will be taken to be those for which the source begins and ends during the construction stage, and the effects do not endure beyond the completion of the construction phase. This covers sources of effects such as construction traffic, noise and vibration from construction activities, dust generation, site runoff, mud on roads, risk of fuel/oil spillage, and the visual intrusion of plant and machinery on-site. Some aspects of construction related effects will last for longer than others, for example impacts related to earth moving are likely to be relatively short in duration in respect of the whole construction period, whereas the construction of energy infrastructure and landscaping activities are likely to persist throughout the entire construction period.

Operational Phase Effects

5.4.2 For the assessment, these are the effects that, although they may start during construction, are either permanent, endure for a substantial period beyond construction or decommissioning, or represent an extended cumulative effect of construction or decommissioning activity. This includes the effects of the physical presence of the energy infrastructure, and its operation, use and maintenance. Timescales associated with these enduring effects are as follows:

- Short term – endures for up to 12 months after construction or decommissioning;
- Medium term – endures for 1-5 years;

- Long term – endures for 5-15 years;
- Reversible Long Term Effects – long-term effects, which endure throughout the lifetime of the Scheme but which cease once the Scheme has been decommissioned (operational effects will all fall into this category); and
- Permanent Effects – effects which will cannot be reversed following decommissioning (e.g. where buried archaeology is permanently removed during construction).

Decommissioning Period Effects

- 5.4.3 For the assessment, these effects will be taken to be those for which the source begins and ends during the decommissioning stage, and the effects do not endure beyond the completion of the decommissioning phase. This covers sources of effects such as construction traffic, noise and vibration from construction activities, dust generation, site runoff, mud on roads, risk of fuel/oil spillage, and the visual intrusion of plant and machinery on-site, for example. As with construction phase effects, some aspects of decommissioning will endure for longer than others.

Assessment Years

- 5.4.4 In order to ensure the EIA is robust in considering the likely significant effects of the Scheme, appropriate assessment scenarios and years have been identified and are discussed below.
- 5.4.5 The peak construction year for the purpose of the EIA is anticipated to be 2023; this assumes commencement of construction in late 2022, with completion in 2024. This is based on the assumption that the Scheme is built out rapidly, which is a worst case from a traffic generation point of view because it compresses the trip numbers into a shorter duration. This would therefore also be the worst case in terms of effects on drivers, pedestrians and cyclists, and traffic-related air quality and noise effects.
- 5.4.6 As described in Paragraph 2.5.2, the Scheme may be built in phases over a longer period of three years, which may be worse, for example, for landscape and visual amenity and the setting of heritage assets, as there will be a longer time over which construction activity could affect receptors.
- 5.4.7 As described in Paragraph 2.5.3, the phasing of the Scheme will be subject to a number of factors. Therefore, the peak construction assessment year will be reviewed as the anticipated construction programme is considered in more detail during design development. A full justification for the reasonable worst case scenario that is assessed will be provided in the ES.
- 5.4.8 The proposed operational assessment year for the purpose of the EIA is 2025 (see Paragraph 2.5.1).
- 5.4.9 A future year of 2040 will also be considered for specific topics including landscape and visual amenity, in terms of the maturation of vegetation (i.e. 15 years after the operational assessment year).
- 5.4.10 The decommissioning assessment year for the purpose of the EIA is 2065, based on the design life of the Scheme, recognising that the operational life may extend beyond this date (see Paragraph 2.7.1).

5.5 Effect Significance Criteria

- 5.5.1 The evaluation of the significance of an effect is important; it is the significance that determines the resources that should be deployed in avoiding or mitigating a significant adverse effect, or conversely, the actual value of a beneficial effect. The overall environmental acceptability of the Scheme is a matter for the SoS to determine, having taken into account, amongst other matters, the environmental information that is set out in the ES, including all likely beneficial and adverse environmental effects. Where it has not been possible to quantify effects, qualitative assessments will be carried out, based on available knowledge and professional judgment. Where uncertainty exists, this will be noted in the relevant topic chapter.

- 5.5.2 The significance of residual effects will be determined by reference to criteria for each assessment topic. Specific effect significance criteria for each technical discipline will be developed, giving due regard to the following:
- Extent and magnitude of the impact (described as high, medium, low and very low);
 - Effect duration (see Paragraph 5.4.2), and whether effects are temporary, reversible or permanent;
 - Effect nature (whether direct or indirect, reversible or irreversible, beneficial or adverse);
 - Whether the effect occurs in isolation, is cumulative or interacts with other effects;
 - Performance against any relevant environmental quality standards;
 - Sensitivity of the receptor (described as high, medium, low and very low); and
 - Compatibility with environmental policies.
- 5.5.3 The significance of residual effects will be evaluated with reference to available definitive standards, accepted criteria and legislation. For issues where definitive quality standards do not exist, significance will be based on the:
- Local, district, regional or national scale or value of the resource affected;
 - Number of receptors affected;
 - Sensitivity of these receptors; and
 - Duration of the effect.
- 5.5.4 In order to provide a consistent approach to expressing the outcomes of the various studies undertaken as part of the EIA, and thereby enable comparison between effects upon different environmental topics, the following terminology will be used in the ES to define residual effects:
- **Adverse** – detrimental or negative effects to an environmental/socio-economic resource or receptor; or
 - **Negligible** (also referred to as 'neutral' for some topics) – imperceptible effects to an environmental/socio-economic resource or receptor; or
 - **Beneficial** – advantageous or positive effect to an environmental/socio-economic resource or receptor.
- 5.5.5 Where adverse or beneficial effects are identified, these will be assessed against the following scale:
- **Minor** – slight, very short or highly localised effect of no significant consequence;
 - **Moderate** – limited effect (by extent, duration or magnitude) which may be considered significant; and
 - **Major** – considerable effect (by extent, duration or magnitude) of more than local significance or in breach of recognised acceptability, legislation, policy or standards; considered significant.
- 5.5.6 Each of the technical chapters provides the criteria, including sources and justifications, for quantifying the different categories of effect. Where possible, this will be based upon quantitative and accepted criteria (for example, noise assessment guidelines), together with the use of value judgment and expert interpretation to establish to what extent an effect is environmentally significant.
- 5.5.7 Table 5-1 illustrates an example of the classification of effects matrix.

Table 5-1 Example matrix to classify environmental effects

<i>Sensitivity or value of resource / receptor</i>	<i>Magnitude of impact</i>			
	<i>High</i>	<i>Medium</i>	<i>Low</i>	<i>Very low</i>
<i>High</i>	Major	Major	Moderate	Minor
<i>Medium</i>	Major	Moderate	Minor	Negligible
<i>Low</i>	Moderate	Minor	Negligible	Negligible
<i>Very low</i>	Minor	Negligible	Negligible	Negligible

5.5.8 Following the classification of an effect, clear statements will be made within the topic chapters as to whether that effect is significant or not significant. As a general rule, major and moderate effects are considered to be significant (as shown by the shaded cells in Table 5-1 above), whilst minor and negligible effects are considered to be not significant. However, professional judgement will be applied, including taking account of whether the effect is permanent or temporary, its duration/frequency, whether it is reversible, and / or its likelihood of occurrence. Generic definitions for the classification of effects are shown in Table 5-2.

Table 5-2 Generic effect descriptions

<i>Effect</i>	<i>Generic description</i>
Major	These effects may represent key factors in the decision making process. Potentially associated with sites and features of national importance or likely to be important considerations at a regional or district scale. Major effects may relate to resources or features which are unique and which, if lost, cannot be replaced or relocated.
Moderate	These effects, if adverse, are likely to be important at a local scale and on their own could have a material influence on decision making.
Minor	These effects may be raised as local issues and may be of relevance in the detailed design of the project, but are unlikely to be critical in the decision making process.
Negligible	Effects which are beneath levels of perception, within normal bounds of variation or within the margin of forecasting error, these effects are unlikely to influence decision making, irrespective of other effects.

5.5.9 Where mitigation measures are identified to eliminate, mitigate or reduce adverse impacts, these have either been incorporated into the design of the Scheme; translated into construction commitments; or operational or managerial standards / procedures. The ES will highlight 'residual' effects, which remain following the implementation of suitable mitigation measures, and classify these in accordance with the effect classification terminology given above.

5.5.10 It should be noted that some technical disciplines may utilise different criteria when undertaking assessments due to differences in industry accepted guidelines and specifications. Where this is the case, the technical topic will discuss how the assessment methodology or classification of effects differs for the general EIA methodology as described in this section and provide justification.

Assessment of Construction and Decommissioning Effects

- 5.5.11 The identification of construction and decommissioning effects will be made on the basis of existing knowledge, techniques and equipment. A 'reasonable worst-case' scenario will be used with respect to the envisaged construction methods, location (proximity to sensitive receptors), phasing and timing of construction activities.
- 5.5.12 As described in Section 5.3 above, the assessment of construction and decommissioning effects will assume the implementation of standard good practice measures, for example the use of temporary noise barriers to reduce noise levels as appropriate and, where practicable, control of dust on haul roads, etc. The purpose of this is to focus on the scheme specific effects, rather than generic construction effects that can be easily addressed using generic best practice mitigation measures. Construction and decommissioning assumptions, including what has been assumed in terms of good practice measures, will be set out within the ES, and the Framework CEMP. The ES will identify and assess construction and decommissioning effects that are likely to remain after these mitigation measures are in place.

5.6 Interaction and Accumulation of Effects

- 5.6.1 In accordance with the EIA Regulations, 'cumulative effects' will be considered. By definition, these are effects that result from incremental changes caused by other past, present or reasonably foreseeable actions together (i.e. cumulatively) with the Scheme.
- 5.6.2 For the cumulative impact assessment, two types of impact will be considered:
- The combined effect of individual impacts from the Scheme, for example noise or pollutants on a single receptor (these will be referred to as 'effect interactions'); and
 - The combined effects of several development schemes which may, on an individual basis be insignificant but, cumulatively with the Scheme, have a new or different likely significant effect.

Effect Interactions

- 5.6.3 There is no established EIA methodology for assessing and quantifying effect interactions that lead to combined effects on sensitive receptors, however the European Commission (EC) has produced guidelines for assessing effect interactions "*which are not intended to be formal or prescriptive, but are designed to assist EIA practitioners in developing an approach which is appropriate to a project...*" (Ref. 31).
- 5.6.4 AECOM has reviewed these guidelines and has developed an approach which uses the defined residual effects of the Scheme to determine the potential for effect interactions that lead to combined effects.
- 5.6.5 The EIA will predict beneficial and adverse effects during construction, operation and decommissioning of the Scheme, which are classified as minor, moderate or major. Several effects on one receptor or receptor group could theoretically interact or combine to produce a combined significant overall effect.
- 5.6.6 An exercise which tabulates the effects on receptors or receptor groups will be undertaken to determine the potential for effect interactions and therefore any combined effects. Only adverse or beneficial residual effects classified as minor, moderate, or major will be considered in relation to potential effect interactions. Residual effects, which are classified as negligible will be excluded from the assessment of the effect interactions as, by virtue of their definition (see Table 5-2), they are considered to be imperceptible effects to an environmental / socio-economic resource or receptor.

Cumulative Effects with Other Developments

- 5.6.7 The Planning Inspectorate's Advice Note 17 on the assessment of cumulative effects (Ref. 32) identifies a four stage approach as follows:

Stage 1 – Establish the NSIP's ZOI and identify long list of 'other development'

- 5.6.8 A review of other developments will be undertaken, initially encompassing a 'zone of influence' defined by the environmental topic specialists to prepare a long list of 'other development'. At this stage, it is anticipated that the long list will be based on up to a 10km area of search.
- 5.6.9 The long list of 'other development' to be included in the assessment of cumulative effects will be reviewed and developed in consultation with the local planning authorities, statutory consultees and other relevant organisations.
- 5.6.10 Development will be included in the initial long-list based on the following criteria:
- a. development currently under construction;
 - b. approved applications which have not yet been implemented (covering the past five years and taking account of those that received planning consent over three years ago and are still valid but have not yet been completed);
 - c. submitted applications not yet determined;
 - d. refused applications, subject to appeal procedures not yet determined;
 - e. on the National Infrastructure Planning Programme of Projects;
 - f. development identified in the relevant Development Plan (and emerging Development Plans); and
 - g. development identified in other plans and programmes which set the framework for future development consents/approvals, where such development is reasonably likely to come forward.
- 5.6.11 Criteria will be developed and applied to filter development which may be excluded from the initial long list, having regard to the size and spatial influence of each development. These criteria will be documented and set out within the ES.

Stage 2 – Identify shortlist of 'other development' for Cumulative Effects Assessment

- 5.6.12 At Stage 2, any developments of a nature or scale without the potential to result in cumulative impacts will be excluded, following discussion with the local planning authorities and consideration of the likely zone of influence for each environmental topic. The justification for including or excluding developments from the long list will be provided in a matrix, modelled on the example given within Appendix E of the Planning Inspectorate's Advice Note 17 (Ref. 32).

Stage 3 – Information gathering

- 5.6.13 Information relating to other developments will be collected from the appropriate source (which may include the local planning authorities, the Planning Inspectorate or directly from the applicant / developer) and will include, but not be limited to:
- a. proposed design and location information;
 - b. proposed programme of demolition, construction, operation and/or decommissioning; and
 - c. environmental assessments that set out baseline data and effects arising from 'other development'.

Stage 4 – assessment

- 5.6.14 The assessment will include a list of those developments considered to have the potential to generate a cumulative effect together with the Scheme, and this will be documented in a matrix which includes the following:
- a. a brief description of the development;
 - b. an assessment of the cumulative effect with the Scheme;
 - c. proposed mitigation applicable to the Scheme including any apportionment; and
 - d. the likely residual cumulative effect.
- 5.6.15 The criteria for determining the significance of any cumulative effect will be based upon:
- a. the duration of effect, i.e. will it be temporary or permanent;
 - b. the extent of effect, e.g. the geographical area of an effect;
 - c. the type of effect, e.g. whether additive or synergistic;
 - d. the frequency of the effect;
 - e. the 'value' and resilience of the receptor affected; and
 - f. the likely success of mitigation.

5.7 Proposed topics to be included in the ES

- 5.7.1 The following chapters present a discussion of the likely or potential significant environmental effects associated with the Scheme that it is proposed will be considered as part of the EIA. The methodology and assessment criteria that will be used to assess the identified effects are also outlined.
- 5.7.2 The topics described are set out in the following list:
- Climate Change (Chapter 6);
 - Cultural Heritage (Chapter 7);
 - Ecology (Chapter 8);
 - Flood Risk, Drainage and Surface Water (Chapter 9);
 - Landscape and Visual Amenity (Chapter 10);
 - Noise and Vibration (Chapter 11);
 - Socio-Economics and Land Use (Chapter 12); and
 - Transport and Access (Chapter 13).
- 5.7.3 Chapter 14 provides a summary of those environmental topics which have been considered during the preparation of this Scoping Report, and for which standalone chapters are not anticipated to be required in the ES. Technical appendices will be provided for these topics with a short summary provided in a single chapter within the ES. These topics include:
- Air Quality;
 - Glint and Glare;
 - Ground Conditions;
 - Human Health;
 - Major Accidents or Disasters; and
 - Waste.

6. Climate Change

6.1 Introduction

6.1.1 To align with the requirements of the EIA Regulations (Ref. 1) and IEMA Guidance for assessing climate mitigation (Ref. 33) and adaptation (Ref. 34) in EIAs, consideration has been given within this chapter to three aspects of climate change assessment:

- **Lifecycle greenhouse gas (GHG) impact assessment** - Impact of GHG emissions arising from the Scheme on the climate over its lifetime;
- **In-combination climate change impact assessment** - Combined impact of the Scheme and future climate change on the receiving environment⁵; and
- **Climate change resilience review** - The resilience of the Scheme to climate change impacts.

6.2 Study Area

GHG impact assessment

6.2.1 The study area for the GHG impact assessment covers all direct GHG emissions arising from activities undertaken on land within the Scheme Boundary during the construction, operation, maintenance and decommissioning of the Scheme. It also includes indirect emissions embedded within the construction materials arising as a result of the energy used for their production, as well as emissions arising from the transportation of materials, waste and construction workers.

6.2.2 The study area also includes activities that may be avoided or displaced as a result of the Scheme such as other electricity production activities.

6.2.3 The environmental impact associated with GHG emissions is a national and global issue. Consequently, the potential significance of the proposed Scheme's lifecycle GHG emissions will be assessed by comparing the estimated GHG emissions from the Scheme against the reduction targets defined in the Climate Change Act 2008 (Ref. 35) and associated five year, legally binding carbon budgets.

In-combination climate change impact assessment

6.2.4 The study area for the in-combination climate change impact assessment is the land within the Scheme Boundary, and includes all environmental receptors identified within the assessments undertaken by the environmental disciplines.

Climate change resilience review

6.2.5 The study area for the climate change resilience review is the land within the Scheme Boundary, i.e. it covers all assets and infrastructure which constitute the Scheme.

6.3 Planning Policy Context and Guidance

6.3.1 Legislation, planning policy and guidance relating to climate change, and pertinent to the Scheme comprises:

Legislation

- Climate Change Act 2008 (Ref. 35); and
- Carbon Budgets Order 2009 (Ref. 36).

⁵ In line with IEMA guidance, this is the combined effect of the impacts of the Scheme and potential climate change impacts on the receiving environment are referred to as 'in-combination impacts' and 'in-combination effects'.

National Planning Policy

- NPS EN-1 (Ref. 5), with particular reference to paragraphs 2.2.9 and 4.8.2 in relation to climate impacts and adaptation; paragraphs 4.1.3 to 4.1.4 in relation to adverse effects and benefits; paragraphs 4.2.1, 4.2.3, 4.2.4, 4.2.8 to 4.2.10 and 5.1.2 in relation to EU Directive and ES requirements; paragraphs 4.5.3 and 4.8.1 to 4.8.12 in relation to adaptation measures in response to climate projections; and paragraphs 5.7.1 to 5.7.2 in relation to climate projections, flood risk and the importance of relevant mitigation.
- NPS EN-3 (Ref. 6) – paragraph 2.3.1 regarding NPS EN-1 and the importance of climate change resilience, and paragraph 2.3.5 in relation to ES requirements regarding climate change resilience.
- NPS EN-5 (Ref. 7) – paragraph 2.4.1 regarding NPS EN-1 and the importance of climate change resilience, and paragraph 2.4.2 in relation to ES requirements regarding climate change resilience.
- NPPF (Ref. 8) – paragraphs 8, 20 and 149 in relation to adaptation, mitigation and climate change resilience; paragraphs 148 and 157 in relation to flood risk and damage to property and people; paragraphs 150 and 153 in relation to reduction of CO₂ emissions through design and reduced energy consumption; and paragraphs 155 to 165 in relation to climate projections, associated flood risk and adaptation.

National Guidance

- Planning Practice Guidance, Climate Change (Ref. 37).

Local Planning Policy

- East Cambridgeshire District Local Plan Adopted April 2015 (Ref. 9), with particular reference to Policy ENV 4: Energy and water efficiency and renewable energy in construction, Policy ENV 6: Renewable energy development and ENV 8: Flood risk.
- East Cambridgeshire District Council SPD Renewable Energy Development (Commercial Scale) October 2014 (Ref. 11).
- Forest Heath District Council Core Strategy Adopted 2010 (Ref. 12), with particular reference to Spatial Objective ENV 1, in relation to climate change, emissions reductions and water efficiency; Spatial Objective ENV 7 in relation to sustainable infrastructure; Policy CS 2 in relation to green infrastructure; and Policy CS 4 in relation to emissions reductions and mitigation and adaptation to future climate change.
- Forest Heath and St Edmundsbury Councils: Joint Development Management Policies Document (last updated February 2015) (Ref. 13), with particular reference to Policy DM7: Sustainable Design and Construction, and Policy DM8: Low and Zero Carbon Energy Generation.

6.3.2 The national planning policies identify the requirement for consideration of climate change resilience. Climate projections should be analysed and appropriate climate change adaptation measures considered throughout the design process. Specific climate change risks identified within these policies include flooding, drought, coastal change, rising temperatures and associated damage to property and people.

6.3.3 Local planning policies identify the need to consider GHG emissions at all stages of a development's lifecycle. New development should aim for reduced or zero carbon development by incorporating renewable or low carbon energy sources and maximising energy and water efficiency where practicable. Provision or enhancement of green infrastructure should also be promoted as described within Policy CS 2 of the Forest Heath District Council Core Strategy Adopted 2010 (Ref. 12).

6.4 Baseline Conditions

GHG impact assessment

- 6.4.1 The current land use within the Scheme Boundary consists of arable land, managed hedgerows and trees. Trees are present individually in some areas as well as rows of trees and small woodland areas. The abundance of vegetation within the Scheme Boundary suggests a relatively high carbon sink potential. Also, current land use within the Scheme Boundary has minor levels of associated GHG emissions as the land use is largely agricultural. Baseline agricultural GHG emissions are dependent on soil and vegetation types present, and fuel use for the operation of vehicles and machinery.
- 6.4.2 For the GHG assessment, the baseline is a 'business as usual' scenario whereby the Scheme is not implemented. The baseline comprises existing carbon stock and sources of GHG emissions within the boundary of the existing activities on-site, as well as the emissions that may be avoided as a result of the Scheme, i.e. from the generation of low-carbon electricity.

In-combination climate change impact assessment

- 6.4.3 The receptors for in-combination climate change impact are receptors within the surrounding environment that will be impacted by the Scheme in combination with future climatic conditions. Baseline conditions for the in-combination climate change impact assessment are determined using the climate change projections data.
- 6.4.4 An initial review of UK Climate Projections 2018 (UKCP18) data (Ref. 38) for the area surrounding the nearest climate station to the Scheme Boundary (Brooms Barn) suggests that by the 2050s time period (2040-2069), the region will experience an increase of around 2.4°C in summer mean air temperature at 1.5m and an increase of 1.7°C in winter mean air temperature at 1.5m, compared to a 1981-2010 baseline period. For the same time period, summer mean precipitation is expected to decrease by around 20%, whilst in winter it is expected to increase by 9%.

Climate change resilience review

- 6.4.5 The receptor for climate change resilience is the Scheme itself. The climate resilience review will provide a description of how the Scheme will be designed to be more resilient to the climate change impacts identified during the review of the UKCP18 data (Ref. 38).
- 6.4.6 A more detailed assessment of climate change projections will be conducted for the land within the Scheme Boundary as part of the ES.

6.5 Potential Effects and Mitigation

GHG impact assessment

- 6.5.1 For the purposes of this assessment, it has been considered that any increase in GHG emissions compared to the baseline has the potential to have an impact, due to the high sensitivity of the receptor (global climate) to increases in GHG emissions. This is in line with the IEMA guidance (Ref. 33), which states that all GHG emissions have the potential to be significant. The application of the standard EIA significance criteria is not considered to be appropriate for climate change mitigation assessments. GHG impacts will be put into context in terms of their impact on the UK's 5 year carbon budgets which set legally binding targets for GHG emissions.

Table 6-1 Potential sources of GHG emissions

<i>Lifecycle stage</i>	<i>Activity</i>	<i>Primary emission sources</i>
Product stage	<p>Raw material extraction and manufacturing of products required to build the equipment for the Scheme. Due to the complexity of this equipment, this stage is expected to make a significant contribution to overall GHG emissions.</p> <p>Transportation of materials for manufacturing.</p>	<p>Embodied GHG emissions from energy use in extraction and production.</p> <p>Emission of potent GHGs during manufacture, such as sulphur hexafluoride (SF₆).GHG emissions from vehicle use.</p>
Construction process stage	<p>On-site construction activity including emissions from construction compounds.</p> <p>Transportation of construction materials (where these are not included in embodied GHG emissions). Due to the nature of the equipment required, this could require shipment of certain aspects over significant distances.</p> <p>Transportation of construction workers.</p>	<p>Energy (electricity, fuel, etc.) consumption from plant and vehicles, generators on-site, and construction worker commuting.</p> <p>Fuel consumption from transportation of materials to site (where these are not included in embodied GHG emissions).</p> <p>GHG emissions from transportation of workers to site.</p>
	<p>Disposal of any waste generated by the construction processes.</p> <p>Land use change.</p> <p>Water use.</p>	<p>GHG emissions from disposal and transportation of waste.</p> <p>GHG emissions from net loss of carbon sink.</p> <p>Provision of potable water, and treatment of waste water.</p>
Operation stage	<p>Operation of the Scheme.</p> <p>Maintenance of the Scheme.</p>	<p>GHG emissions from energy consumption, provision of potable water, and treatment of waste water. These operational aspects are expected to be negligible in the context of overall GHG emissions.</p> <p>Leakage of potent GHGs during operation, such as SF₆.</p> <p>GHG emissions from energy consumption, material use and waste generation as a result of site maintenance. Maintenance is generally expected to be insignificant, however if part replacement is required this has the potential to be significant given the complexity of the equipment required.</p>

<i>Lifecycle stage</i>	<i>Activity</i>	<i>Primary emission sources</i>
Decommissioning stage	On-site decommissioning activity.	Energy (electricity, fuel, etc.) consumption from plant, vehicles and generators on site.
	Transportation and disposal of waste materials.	GHG emissions from disposal and transportation of waste. This has the potential to be significant given the complexity of the equipment.
	Transportation of workers.	GHG emissions from transportation of workers to site.

6.5.2 The GHG emissions offset through the production of cleaner electricity during the operational phase will be accounted for within the GHG emissions calculations.

6.5.3 A CEMP will be prepared and implemented by the selected Principal Contractor to include a range of best practice construction measures, such as:

- Specification of alternative materials with lower embodied GHG emissions; and
- Low carbon design specifications such as energy-efficient lighting and durable construction materials to reduce maintenance and replacement cycles.

6.5.4 The final selection of any mitigation measures, if required, will be detailed as part of the lifecycle GHG impact assessment in the ES. This may include GHG emission mitigation measures concerning construction, operation and decommissioning of the Scheme.

In-combination climate change impact assessment

6.5.5 In-combination climate impact assessment identifies how the resilience of various receptors in the surrounding environment is affected by a combination of future climate conditions and the Scheme. The climate parameters relevant to the Scheme are detailed in Table 6-2 below together with the rationale for scoping. On the basis of the information presented in Table 6-2, an in-combination climate change impact assessment is proposed to be scoped out.

Table 6-2 Climate parameters for the in-combination climate change impact of the Scheme

<i>Parameter</i>	<i>Scoped In/ Out</i>	<i>Rationale for Scoping Conclusion</i>
Temperature change	Out	While impacts are expected as a result of projected temperature increases, these temperature increases in combination with the Scheme are not expected to have a significant impact upon receptors identified by other environmental disciplines.
Sea level rise	Out	The Scheme is not located in areas that are susceptible to sea level rise.
Precipitation change (increased frequency and magnitude of precipitation events) and rainfall and low precipitation and drought conditions	Out	Climate change may lead to an increase in substantial precipitation events that could lead to flash flooding or changes to groundwater levels. However, no significant impacts on surface water or groundwater levels are expected as a result of precipitation changes, in combination with the Scheme, as the flow of precipitation to ground will not be significantly hindered. The Scheme, in combination with projected changes in precipitation, is also not expected to have a significant impact upon receptors identified by other environmental disciplines.

<i>Parameter</i>	<i>Scoped In/ Out</i>	<i>Rationale for Scoping Conclusion</i>
Wind	Out	The Scheme, in combination with projected changes in wind patterns, is not expected to have a significant impact upon receptors identified by other environmental disciplines.

Climate change resilience review

6.5.6 Climate parameters relevant to the climate change resilience review are detailed in Table 6-3 below.

Table 6-3 Parameters scoped into the Climate Change Resilience Review

<i>Parameter</i>	<i>Scoped In/ Out</i>	<i>Rationale for Scoping Conclusion</i>
Extreme weather events	In	The Scheme may be vulnerable to extreme weather events such as storm damage to structures and assets.
Increased average temperatures and incidence of heatwaves	In	Extremes in temperatures may result in heat stress of materials and structures.
Increased frequency of heavy precipitation events	In	The Scheme may be vulnerable to changes in precipitation, for example, land subsidence and damage to structures and drainage systems during periods of heavy rainfall.
Increase in strong wind events	In	The Scheme may be vulnerable to changing wind patterns, for example, high winds and falling trees could damage structures and assets.
Sea level rise	Out	The Scheme is not located in areas that are susceptible to sea level rise.

6.5.7 The climate change resilience review will qualitatively assess the Scheme's resilience to climate change. This will be completed in liaison with the project design team and the other EIA technical disciplines by considering the climate projections for the geographical location and timeframe of the Scheme.

6.5.8 A statement will be provided within the ES to describe how the Scheme will be adapted to improve its resilience to future climate conditions.

6.6 Assessment Methodology

GHG impact assessment

6.6.1 The GHG assessment will follow a project lifecycle approach to calculate estimated GHG emissions arising from the construction, operation and decommissioning of the Scheme and to identify GHG 'hot spots' (i.e. emissions sources likely to generate the largest amount of GHG emissions). This will enable the identification of priority areas for mitigation in line with the principles set out in IEMA guidance (Ref. 33).

6.6.2 In line with the World Business Council for Sustainable Development and World Resources Institute GHG Protocol guidelines (Ref. 39), the GHG assessment will be reported as tonnes of carbon dioxide equivalent (tCO₂e) and will consider the seven Kyoto Protocol gases:

- Carbon dioxide (CO₂);
- Methane (CH₄);

- Nitrous oxide (N₂O);
- Sulphur hexafluoride (SF₆);
- Hydrofluorocarbons (HFCs);
- Perfluorocarbons (PFCs); and
- Nitrogen trifluoride (NF₃).

6.6.3 Expected GHG emissions arising from the construction activities, embodied carbon in materials and operational emissions of the Scheme, as well as baseline emissions, will be quantified using a calculation-based methodology as per the following equation, and aligned with the GHG Protocol:

$$\text{Activity data} \times \text{GHG emissions factor} = \text{GHG emissions}$$

6.6.4 Department for Environment, Food and Rural Affairs (Defra) 2018 emissions factors (Ref. 40) and embodied carbon data from the Inventory of Carbon and Energy (ICE) (Ref. 41) will be used as the source data for calculating GHG emissions.

6.6.5 The sensitivity of the receptor (global climate) to increases in GHG emissions is always defined as high as any additional GHG impacts could compromise the UK's ability to reduce its GHG emissions and therefore meet its future 5 year carbon budgets. Also, the extreme importance of limiting global warming to below 2°C this century is broadly asserted by the International Paris Agreement (Ref. 42) and the climate science community.

6.6.6 Due to the absence of any defined industry guidance for assessing the magnitude of GHG impacts for EIA, standard GHG accounting and reporting principles will be followed to assess impact magnitude. In GHG accounting, it is common practice to consider exclusion of emission sources that are <1% of a given emissions inventory on the basis of a minimal contribution. Both Department of Energy and Climate Change (DECC) guidance (0) and the PAS (publicly available specification) 2050 (2011) (Ref. 44) allow emissions sources of <1% contribution to be excluded from emission inventories, and these inventories to still be considered complete for verification purposes. This would therefore suggest that a development with emissions of <1% of the UK inventory and relevant carbon budget would be minimal in its contribution to the wider national GHG emissions.

6.6.7 A further reference is that the International Finance Corporation includes a reporting threshold for projects that it contributes funding to of over 25,000 tCO₂e (carbon dioxide equivalent) in any year (Ref. 45). The magnitude of the impact will therefore be determined by a boundary of less than or more than 1% of total emissions arising during the 5 year carbon budgets or more than 25,000 tCO₂e in any year.

Climate change resilience review

6.6.8 The Scheme's resilience to climate change will be considered qualitatively. This will be completed in liaison with the project design team and the other ES technical specialists by considering the climate projections for the geographical location and timeframe of the Scheme. The significance of climate resilience will not be assessed.

6.6.9 A statement will be provided to describe how the Scheme has been designed to be as resilient as is reasonably practicable to future climate change.

6.7 Assumptions, Limitations and Uncertainties

6.7.1 Where detailed information is not available regarding energy use, types and quantities of materials used, or the embodied carbon of key features of the assets, assumptions will be made based on industry approximations and professional best practice.

6.7.2 All assumptions and limitations, including any exclusions, together with assumptions for choices and criteria leading to exclusion of input and output data will be documented as part of the assessment.

7. Cultural Heritage

7.1 Introduction

- 7.1.1 This chapter sets out the approach to the assessment of the Scheme's impacts on cultural heritage (comprising built heritage, archaeology and the historic landscape). The purpose of the assessment will be to identify and characterise any relevant cultural heritage resources, to consider the nature and scale of potential impacts arising from the Scheme, and to assess the significance of any likely effects.

7.2 Study Area

- 7.2.1 The study area for cultural heritage assets will extend to a distance of 1km from the Scheme Boundary. This will allow heritage assets to be set within their wider context, and allow for the assessment of archaeological potential of the Sunnica East Site, Sunnica West Site, the Grid Connection Route A and Grid Connection Route B (including the Burwell National Grid Substation Extension).
- 7.2.2 A flexible approach will be taken to the identification of high-value assets on which there may be an impact upon setting, up to 5km beyond the Scheme Boundary. Assets beyond this distance may also be considered, where required. This will be guided by the Scheme's Zone of Theoretical Visibility (ZTV) (refer to **Chapter 10: Landscape and Visual Amenity**, of this Scoping Report), but will also consider physical and historical connectivity and relationships with other monuments and the wider landscape.

7.3 Planning Policy Context and Guidance

- 7.3.1 Legislation, planning policy and guidance relating to cultural heritage and pertinent to the Scheme project comprises:

Legislation

- Infrastructure Planning (Decisions) Regulations 2010 (Ref. 46X);
- Planning (Listed Buildings and Conservation Areas) Act 1990 (Ref. 46) (excluding normal planning procedures, which are disapplied by the DCO, which if granted, would encompass all of the normal consents); and
- Ancient Monuments and Archaeological Areas Act 1979 (Ref. 47) (amended by the National Heritage Act 1983 (Ref. 48) and 2002 (Ref. 49).

National Planning Policy

- NPS EN-1 (Ref. 5) with particular reference to Section 5.8 in relation to the significance, impact and recording of the historic environment;
- NPS EN-3 (Ref. 6) with particular reference to paragraph 2.5.34 in relation to the impact on the historic environment;
- NPS EN-5 (Ref. 7) with particular reference to paragraph 2.8.9 in relation to the archaeological consequences of electricity line installation; and
- NPPF (Ref. 8) with particular reference to Section 16: Conserving and Enhancing the Historic Environment.

National Guidance

- Planning Practice Guidance, Conserving and enhancing the historic environment (Ref. 50);
- Historic Environment Good Practice Advice in Planning Note 2. Managing Significance in Decision Taking in the Historic Environment. Historic England (Ref. 51); and

- Historic Environment Good Practice Advice in Planning Note 3. The Setting of Heritage Assets. Historic England (2nd edition, 2017) (Ref. 52).

Local Planning Policy

- East Cambridgeshire District Council Local Plan Adopted April 2015 (Ref. 9), with particular reference to Policy ENV11: Conservation Areas; Policy ENV 12: Listed Buildings; Policy 13: Local Register of Buildings and Structures; Policy 14: Sites of archaeological interest; Policy 15: Historic parks and gardens; and Policy 16: Enabling development associated with heritage assets;
- East Cambridgeshire District Council SPD Renewable Energy Development (Commercial Scale) October 2014 (Ref. 11), with particular reference to Section 4: Heritage Assets;
- Forest Heath District Council Core Strategy Adopted 2010 (Ref. 12), with particular reference to Policy CS3 in relation to Landscape Character and the Historic Environment; and
- Forest Heath and St Edmundsbury Local Plan: Joint Development Management Policies Document (last updated February 2015) (Ref. 13), with particular reference to Policies DM15: Listed Buildings; Policy DM16: Local Heritage Assets and Buildings Protected by an Article 4 Direction; Policy DM17: Conservation Areas; Policy DM18: New Uses for Historic Buildings; Policy DM19: Development Affecting Parks and Gardens of Special Historic or Design Interest; Policy DM20: Archaeology; and Policy DM21: Enabling Development.

7.3.2 The legislation identifies the requirement for the SoS to have regard to the desirability of preserving listed buildings, Scheduled Monuments and the character of conservation areas. The national planning policies identify the requirement for consideration of the conservation of the historic environment. Conservation is an active process of maintenance and managing change. Where changes are proposed, the NPPF (Ref. 8) sets out a clear framework for both plan-making and decision-taking to ensure that heritage assets are conserved, and where appropriate enhanced, in a manner which is consistent with their significance and thereby achieving sustainable development.

7.3.3 Local planning policies identify the need to protect, conserve, and seek opportunities to enhance local heritage assets and their setting. New development should respect, enhance, and reinforce where appropriate the local character and distinctiveness of the area in which it would be situated. Where impacts cannot be avoided, a programme of conservation appropriate to a heritage asset's significance should be undertaken.

7.4 Baseline Conditions

7.4.1 The Scheme occupies a large area which has largely not been subject to previous archaeological study. The following paragraphs provide an outline of the baseline. Designated heritage assets are shown on Figure 7-1 and non-designated heritage assets are shown on Figure 7-2.

Sunnica East Site

7.4.2 The baseline, as derived from the Historic Environment Record (HER) databases, comprises assets (both features and stray artefacts/material culture scatters) dating from the Palaeolithic to the modern periods.

7.4.3 Within the Sunnica East Site, the majority of recorded assets are located in the north-western area, north of the B1102, between Worlington and Freckenham. The remainder of the Sunnica East Site is largely devoid of recorded assets. Within the 1km study area, finds are also unevenly distributed, with concentrations around Worlington/Barton Mills, Freckenham, Red Lodge, and in lesser densities, in the swathe of land either side of the River Kennett between Freckenham and Red Lodge.

7.4.4 The HER 'Events' database, which plots areas subject to field work, indicates that the north-west portion of the Sunnica East Site has been subject to non-intrusive and non-systematic investigation, mainly by metal-detector survey.

7.4.5 In outline, the known archaeological baseline for the Sunnica East Site and its immediate environs is as follows:

- Palaeolithic: two Upper Palaeolithic blades recovered during field walking (within the Sunnica East Site); bones of hippo, bison, rhino, elephant, lion and horse unearthed during railway construction (within the 1km study area);
- Mesolithic: microlith found in association with Chalk Hill barrow (within the Sunnica East Site); further lithics recovered within the Sunnica East Site and in the 1km study area;
- Neolithic: flint axe (within the Sunnica East Site); pottery sherds and burnt bone found near Swales Tumuli (within the 1km study area); potential cropmarks and other features may also date to the Neolithic (within the 1km study area);
- Bronze Age: scheduled Chalk Hill bowl barrow (within the Sunnica East Site); pottery and flint unearthed in pits (within the Sunnica East Site); stray finds of worked flints and bronze awl (within the Sunnica East Site); scheduled Lumber Hill bowl barrow (within the 1km study area);
- Iron Age: pits found at Bay Farm (within the Sunnica East Site); gold stater of Cunobelin (within the Sunnica East Site); minor features such as pits and ditches (within 1km study area); hoard of Iceni staters in Freckenham (within the 1km study area); further stray coin finds (within the 1km study area);
- Roman: hoard of 600 bronze coins in the north-west of the Sunnica East Site; metalwork scatter (within the Sunnica East Site); enamelled brooch scatter (within the Sunnica East Site); Hod hill type brooch (within the Sunnica East Site); material scatter south of Freckenham which includes a hypocaust tile (within the 1km study area); concentration of finds at Fort William (within the 1km study area); metalwork and pottery finds (within the 1km study area);
- Early medieval: Saxon pin find spot (within the Sunnica East Site); find spot of a Saxon bronze book fitting (within the Sunnica East Site); possible sunken-floored building in association with a Saxon brooch, pin, and pottery (within the 1km study area); stray finds of Anglo-Saxon coins and other metalwork (within the 1km study area);
- Medieval: silver coin scatter (within the Sunnica East Site); artefact and pottery scatters (within the Sunnica East Site and the 1km study area); Red Lodge Warren (within the 1km study area);
- Post-medieval: metalwork scatter (within the Sunnica East Site); former water meadow and ridge and furrow near Freckenham (within the 1km study area); Cambridge to Mildenhall railway (within the Sunnica East Site);
- Modern: World War One practice trenches to the north-west of Red Lodge (within the 1km study area); five World War Two pillboxes (within the 1km study area).

7.4.6 There are no listed buildings within the Sunnica East Site.

7.4.7 There are 24 listed building within the 1km study area. These are concentrated in the villages of Worlington and Freckenham, and the hamlet of Badlingham, while an early 19th-century house (The Manor) and a mid-16th century farmhouse are located south-west of Barton Mills. All Saints Church in Worlington is a Grade I structure (NHLE 1037585), while the Church of St Andrew (NHLE 1037614) and the Manor House (NHLE 1037615) in Freckenham are both listed at Grade II*. The remaining buildings are listed at Grade II.

7.4.8 There are an additional 190 listed buildings outside the 1km study area but within the wider 5km study area (six Grade I; eight Grade II*; 176 Grade II). All six of the Grade I structures are churches, situated within the settlements of Mildenhall, Tuddenham, Isleham (two buildings), Chippenham and Fordham. The Grade II* structures comprise four churches (Kentford, Kennett, Barton Mills, Herringswell) a farmhouse at Barton Mills, and stables, lodges and a school house in Chippenham.

- 7.4.9 There are no registered parks and gardens within the Sunnica East Site or the 1km study area. Chippenham Hall Registered Park and Garden lies approximately 2.5 km to the south-west of the Sunnica East Site (RPG Grade II; NHLE 1000615) within the 5km study area.
- 7.4.10 There is one conservation area that falls within the 1km study area, Freckenham Conservation Area. Freckenham is a small village located to the west of the Sunnica East Site. The conservation area encloses nine listed buildings, located along Church Lane, Elms Road and North Street, including the Grade II* Listed Manor House (NHLE 1037615).

Sunnica West Site

- 7.4.11 The baseline for the 1km study area, as derived from the HER databases, comprises assets (both features and stray artefacts/material culture scatters) dating from the Neolithic to modern periods. As with the Sunnica East Site, the distribution exhibits a distinct spatial bias. Within the Sunnica West Site, the majority of artefactual finds are reported in the north-western area, with several find spots in the north-east. Four Bronze Age barrows are recorded in the south-east of the Sunnica West Site, bordering the A14, with a number of others recorded in the 1km study area. The remainder of the Sunnica West Site is largely devoid of recorded assets. Within the surrounding 1km study area, finds are more evenly distributed, albeit in lesser densities in the south-east part of the study area. This may be due to the early 20th century development of the A14 and the mid-19th century Bury St Edmunds railway line in the area.
- 7.4.12 The HER 'Events' database indicates that archaeological investigations in the 1km study area have been focused primarily on the north, near Chippenham Park. The south-east portion of the study area has no recorded investigations.
- 7.4.13 In outline, the known baseline for the Sunnica West Site and its immediate environs is as follows:
- Neolithic: find spots of an arrowhead, three flint scatters, and a knapping site (within the 1km study area);
 - Bronze Age: a group of four scheduled barrows adjacent to the A11/A14 (within the Sunnica West Site) which are part of the Chippenham barrow cemetery, incorporating a further three scheduled extant barrows (within the 1km study area); flint implement (within Site); ring ditches, unscheduled barrows, and artefact find spots (within the 1km study area);
 - Iron Age: coins found at Foxburrow Plantation (within the Sunnica West Site); Iron Age and Roman pottery scatter (within the Sunnica West Site); rectilinear enclosure cropmarks (within the Sunnica West Site); find spots of pottery, coins and jewellery (within the 1km study area); Snailwell warrior burial (within the 1km study area); settlement in Foxburrow Plantation (within the 1km study area);
 - Roman: bead, brooch, coins and sherds at Snailwell Fen (within the Sunnica West Site); possible villa at Snailwell (within the 1km study area); seven find spots including pottery, weaponry, and coin hoards (within the 1km study area);
 - Early medieval: two find spots of pottery and a 9th century hooked silver tag (within the 1km study area);
 - Medieval: furlong boundaries in the open land around the fringes of the modern villages (within the 1km study area); earthworks thought to date to medieval period (within the 1km study area);
 - Post-medieval: Gardens and park at Fordham Abbey (within the Sunnica West Site), Ely to Newmarket railway and Great Eastern railway (within the 1km study area); documentary evidence for structures in Snailwell, Chippenham, and within Chippenham Park (within the 1km study area); and
 - Modern: RAF Snailwell remains including a metalled runway and associated buildings (within the Sunnica West Site).

- 7.4.14 There are no listed buildings within the Sunnica West Site. There are 14 listed buildings within the 1km study area. These reflect development in the medieval and post-medieval eras. They include three Grade II* listed buildings, the parish Church of St Peter (Grade II*, NHLE 1331773); The Old Rectory (Grade II*, NHLE 1331772); and the Lodges, gateway and railings (Grade II*, NHLE 1126376) to the south of Chippenham Hall Park. The agricultural history of the area is illustrated by a number of farmhouses, within the village of Snailwell but also scattered in the countryside including the Waterhall farmhouse (Grade II, NHLE 1126383) and the Park Farmhouse (Grade II, NHLE 1162059).
- 7.4.15 There is one RPG that falls within the Sunnica West Site, which is Chippenham Hall RPG (Grade II, NHLE 1000615). Chippenham Hall RPG includes 19th century pleasure grounds surrounded by a park laid out at the beginning of the 18th century and subsequently landscaped in the 1790s by William Emes and Samuel Lapidge.
- 7.4.16 The former 18th century main entrance drive extends c. 3.2 km to the south of the Grade II* lodges and gateway (NHLE 1126376) to the south of the park, and runs from south to north through the Sunnica West Site to the gardens. The gardens themselves are not located within the Sunnica West Site.
- 7.4.17 The RPG is set around The Hall (Grade II, NHLE 1331778), a Queen Anne Revival country house. Additional listed buildings are located within the RPG to the north of the Hall, including the Grade II* Stable Block (NHLE 1126375).
- 7.4.18 There is one conservation area that falls within the 1km study area, Snailwell Conservation Area. Snailwell is a small village located to the south-west of Chippenham Hall RPG. All but a very small number of properties are included within the conservation area. The conservation area encloses ten listed buildings, most of them located to the west of The Street around Church Lane.
- 7.4.19 There are an additional 18 Grade I and II* listed buildings outside the 1km study area but within the wider 5km study area (four Grade I; 15 Grade II*), as well as more than 150 Grade II listed buildings. All four Grade I buildings are churches situated within the settlements of Chippenham (Parish Church of St Margaret), Fordham (Parish Church of St Peter), Exning (Church of St Martin) and Moulton (Church of St Peter). The Grade II* structures also include churches (Kennett, Landwade, Kentford, Herringswell, Freckenham and Newmarket), as well as stables, lodges, a school house in Chippenham and country houses.

Grid Connection Routes and Burwell National Grid Substation Extension

- 7.4.20 The baseline, as derived from the HER databases, records assets dating from the Mesolithic to modern periods. Within the study area for the Grid Connection Route B, there is a small concentration of assets to the south of Fordham, and a small cluster in the west, in Burwell.
- 7.4.21 The HER 'Events' database indicates that archaeological investigations, as a result of other past local development, in the study area are concentrated in the area between Fordham and Snailwell, with a further cluster of investigations at either end, in Burwell and Red Lodge.
- 7.4.22 The recorded baseline for the cable route corridors for Grid Connection Route A and Grid Connection Route B (including the Burwell National Grid Substation), and their immediate environs is summarised below. Assets noted above in relation to the Sunnica East Site and Sunnica West Site are not mentioned again here.
- Mesolithic: collection of Mesolithic and Bronze Age flints at Fordham House;
 - Neolithic: area of worked and burnt flints and prehistoric remains dating between the Neolithic and Iron Age, comprising buried archaeological remains near Fordham Bypass;
 - Bronze Age: prehistoric settlement at Landwade; excavated barrow approximately 65m west of the A142 at Fordham; flint implement found at Snailwell;

- Iron Age: settlement at Snailwell Fen; rectilinear enclosure marks at Snailwell; two find spots in Snailwell; crouched inhumation and sub-surface deposits dating from the 'late prehistoric';
- Roman: bracelet fragment at Burwell; artefact scatter including bead, brooch, coins, and sherds; inhumation and sub-surface deposits recorded as Roman to medieval in date;
- Medieval: Burwell Lode, a watercourse known from documentary evidence; earthworks to the west and north of Landwade church; ridge and furrow evidence near Burwell; three records of furlong boundaries around Burwell; and
- Post-medieval: Chippenham Park; Goose Hall; a ditched enclosure; Barnwell Junction to Mildenhall.

7.4.23 There are approximately 48 listed buildings within 1km of Grid Connection Routes A and B, and the Burwell National Grid Substation Extension. However, as the cable will be underground, no permanent significant effects are anticipated upon these assets. While there may be temporary effects on some assets during construction, these are not considered to be significant.

7.4.24 Burwell North Street Conservation Area lies within the 1km study area, to the east of Grid Connection Route B and the Burwell National Grid Substation Extension. Burwell High Street Conservation Area lies just outside the 1km study area to the south east of the Scheme Boundary.

7.5 Potential Effects and Mitigation

7.5.1 Construction of the Scheme has the potential to affect heritage assets in the following ways:

- a. Partial or total removal of heritage assets;
- b. Compaction of archaeological deposits by construction traffic and structures;
- c. Adverse effects on the setting of heritage assets including changes to visual intrusion, noise, air quality, severance, access and amenity as a result of construction works.

7.5.2 During operation of the Scheme, there is potential for impacts on the setting of heritage assets as a result of security lighting. No operational effects are anticipated for the Grid Connection Routes A and B.

7.5.3 Mitigation will be inbuilt to the design of the Scheme to minimise impacts on heritage assets and their setting as far as possible. An appropriate archaeological mitigation strategy, for the identified impacts from construction and operation upon heritage assets, will be agreed (where possible) with the Cambridgeshire and Suffolk Archaeology Services, the Conservation Officers from the East Cambridgeshire and Forest Heath District Councils and, where required, Historic England.

7.6 Assessment Methodology

7.6.1 The value of a heritage asset (i.e. its heritage significance) is guided by its designated status but is also derived from its heritage interest which may be archaeological, architectural, artistic or historic (NPPF Annex 2, Glossary (Ref. 8)). Each identified heritage asset can be assigned a value in accordance with the criteria set out in Table 7-1. Using professional judgement and the results of consultation, heritage assets will be assessed on an individual basis and regional variations and individual qualities are taken into account where applicable.

Table 7-1 Criteria for assessing the value of heritage assets

<i>Asset value</i>	<i>Description</i>
High	<p>World Heritage Sites</p> <p>Scheduled Monuments</p> <p>Grade I and II* listed buildings</p> <p>Registered battlefields</p> <p>Grade I and II* registered parks and gardens</p> <p>Conservation areas of demonstrable high value</p> <p>Non-designated heritage assets (archaeological sites, historic buildings, monuments, parks, gardens or landscapes) that can be shown to have demonstrable national or international importance.</p> <p>Well preserved historic landscape character areas, exhibiting considerable coherence, time-depth or other critical factor(s).</p>
Medium	<p>Grade II listed buildings</p> <p>Conservation areas</p> <p>Grade II registered parks and gardens</p> <p>Conservation areas</p> <p>Non-designated heritage assets (archaeological sites, historic buildings, monuments, park, gardens or landscapes) that can be shown to have demonstrable regional importance.</p> <p>Averagely preserved historic landscape character areas, exhibiting reasonable coherence, time-depth or other critical factor(s).</p> <p>Historic townscapes with historic integrity in that the assets that constitute their make-up are clearly legible.</p>
Low	<p>Locally listed buildings</p> <p>Non-designated heritage assets (archaeological sites, historic buildings, monuments, park, gardens or landscapes) that can be shown to have demonstrable local importance.</p> <p>Assets whose values are compromised by poor preservation or survival of contextual associations to justify inclusion into a higher grade.</p> <p>Historic landscape character areas whose value is limited by poor preservation and/ or poor survival of contextual associations.</p>
Not significant	<p>Assets identified on national or regional databases, but which have no archaeological, architectural, artistic or historic value.</p> <p>Assets whose values are compromised by poor preservation or survival of contextual associations to justify inclusion into a higher grade.</p> <p>Landscape with no or little significant historical merit.</p>

7.6.2 Assets classed as 'not significant' will not be considered further in the assessment.

7.6.3 Having identified the value of the heritage asset, the next stage in the assessment will be to identify the level and degree of impact to an asset arising from the development. Impacts may arise during construction or operation and can be temporary, reversible, or permanent. Impacts can occur to the physical fabric of the asset or affect its setting. The contribution of the setting to the significance of any affected assets will be subject to assessment.

- 7.6.4 The level and degree of impact (impact rating) will be assigned with reference to a four-point scale as set out in Table 7-2. The assessment of the level and degree of impact will be made in consideration of any scheme design mitigation (embedded mitigation). If no impact is identified, no impact rating will be given and no resulting effect reported.

Table 7-2 Factors influencing the assessment of magnitude of impacts

<i>Magnitude of Impact</i>	<i>Description of impact</i>
High	Changes such that the significance of the asset is totally altered or destroyed. Comprehensive change to, or total loss of, elements of setting that would result in harm to the asset and our ability to understand and appreciate its significance.
Medium	Change such that the significance of the asset is significantly altered or modified. Changes such that the setting of the asset is noticeably different, affecting significance and resulting in changes in our ability to understand and appreciate the significance of the asset.
Low	Changes such that the significance of the asset is slightly affected. Changes to the setting that have a slight impact on significance resulting in changes in our ability to understand and appreciate the significance of the asset.
Very Low	Changes to the asset that hardly affect significance. Changes to the setting of an asset that have little effect on significance and no real change in our ability to understand and appreciate the significance of the asset

- 7.6.5 An assessment to classify the effect, having taken into consideration any embedded mitigation, is determined using the matrix in Table 7-3, which takes account of the value of the asset (Table 7-1) and the magnitude of impact (Table 7-2). Effects can be neutral, adverse or beneficial.

Table 7-3 Assessment of Effects

<i>Heritage asset value</i>	<i>Magnitude of impact</i>			
	<i>High</i>	<i>Medium</i>	<i>Low</i>	<i>Very Low</i>
<i>High</i>	Major	Major	Moderate	Minor
<i>Medium</i>	Major	Moderate	Minor	Minor
<i>Low</i>	Moderate	Minor	Minor	Negligible

- 7.6.6 Major and moderate effects will be considered significant. Within the NPPF (Ref. 8) and NPS EN-1 (Ref. 5), impacts affecting the value of heritage assets are considered in terms of harm, and there is a requirement to determine whether the level of harm amounts to 'substantial harm' or 'less than substantial harm'. There is no direct correlation between the classification of effect as reported in the ES and the level of harm caused to heritage significance. A major (significant) effect on a heritage asset would, however, more often be the basis by which to determine that the level of harm to the significance of the asset would be substantial. A moderate (significant) effect is unlikely to meet the test of substantial harm and would therefore more often be the basis by which to determine that the level of harm to the significance of the asset would be less than substantial. A minor or negligible (not significant) effect would still amount to a less than substantial harm. However, a neutral effect is classified as no harm. Pursuant to NPS EN-1 (Ref. 5), any harmful impact to the significance of a designated heritage asset should be weighed against the public benefit of the Scheme, whilst

Regulation 3 of the Infrastructure Planning (Decisions) Regulations 2010 (Ref. 46) requires the SoS to have regard to the desirability of preserving a listed building or its setting. In all cases, the determination of the level of harm to the significance of the asset arising from development impact is one of professional judgement.

Sources of information

Desk-based sources

7.6.7 Sources of information that will be consulted include:

- National Heritage List for England (NHLE);
- Cambridgeshire Historic Environment Record (HER);
- Suffolk County Council Historic Environmental Record (HER);
- Portable Antiquities Scheme (PAS);
- The Cambridgeshire and Suffolk Record Offices;
- Aerial photographs (Historic England);
- LIDAR (Environment Agency);
- Published and unpublished literature;
- British Geological Survey (BGS) Geology of Britain Viewer; and
- Online bibliographic resources such as the Archaeological Data Service (ADS) and the British and Irish Archaeological Bibliography (BIAB).

Field walkover

7.6.8 A walkover survey will be undertaken including a visit to known archaeological and heritage assets within the Scheme Boundary to record their survival, extent, condition, setting and significance.

Field Investigation

7.6.9 Field investigation will be undertaken to refine and augment the desk-based data. The scope and specification of the field investigations will be set out in a Written Scheme of Investigation (WSI), which will be subject to agreement with the County Archaeologists for Cambridgeshire and Suffolk. As a minimum, it is anticipated that geophysical survey will be undertaken in areas of interest, and, where required, to be followed by evaluation trenching. Other techniques cannot be discounted at this stage.

7.7 Assumptions, Limitations and Uncertainties

7.7.1 It is assumed that there will be access to all required land to undertake both intrusive and non-intrusive archaeological surveys, and that the results of the surveys will be available to incorporate within the ES. In the event that access is not available, professional judgement will be used, based on available research and data, to assess the archaeological potential of the area.

8. Ecology

8.1 Introduction

- 8.1.1 This chapter outlines the proposed approach to assess the potential impacts and effects on ecology associated with the Scheme.
- 8.1.2 The ecological impact assessment will identify and evaluate important ecological features, i.e. receptors (including nature conservation designations, priority habitats and protected / notable species) within the study area. It will consider the effects that the Scheme is likely to have on their conservation status, inter-relationships and contribution to local, regional and (if appropriate) national biodiversity.
- 8.1.3 Avoidance, reduction, mitigation and, if necessary, compensation measures that may be required to enable the Scheme to proceed will be identified, in compliance with relevant nature conservation legislation and planning policy, and that the works have been planned accordingly, to demonstrate that due consideration has been given to ecological features, including recommendations for biodiversity enhancements, where appropriate.
- 8.1.4 To date, the assessment of the Scheme comprises a Preliminary Ecological Appraisal (PEA), which includes a desk study, Phase 1 Habitat Survey and Protected Species Scoping survey. Surveys of wintering birds commenced in November 2018 and are ongoing until March 2019.
- 8.1.5 Further ecological surveys will be undertaken in 2019 to gather detailed baseline information. The requirement and extent of these surveys will be informed by the desk study data and the PEA, together with AECOM's professional judgement and local knowledge of the geographical area and range of important ecological features.

8.2 Study Area

- 8.2.1 The study area for ecological surveys includes the land within Scheme Boundary and an appropriate buffer zone around the above areas, as described below.
- 8.2.2 The boundaries and zones for the ecology study area reflect standard industry good practice and the scoping distances that statutory consultees would typically expect to be considered for identification of features external to the Scheme that could be affected. This is informed by published guidance and professional judgement.
- 8.2.3 The desk study has included a search for international nature conservation sites (Special Areas of Conservation, Special Protection Areas and Ramsar sites) within 10km of the Scheme Boundary (see Figure 8-1), and national statutory and non-statutory nature conservation designations within 2km (see Figure 8-2). Records of protected and notable species have been identified up to 2km from the Scheme Boundary.
- 8.2.4 The desk study has enabled determination of an appropriate study area, within which all important ecological features requiring assessment, as well as ecological features that could be directly or indirectly affected by the Scheme, will be subject to field survey. The study area varies according to the spatial characteristics of each species or habitat potentially impacted. A 'zone of potential influence' representing the areas within which effects could occur from the Scheme and associated activities will be identified and detailed in the assessment.

8.3 Planning Policy Context and Guidance

8.3.1 Legislation, planning policy and guidance relating to protected nature conservation sites, significant habitats and protected / notable species pertinent to the Scheme is outlined below:

Legislation

- The Wildlife and Countryside Act 1981, as amended (Ref. 53);
- The Countryside and Rights of Way Act 2000 (Ref. 54);
- The Conservation of Habitats and Species Regulations 2017 (Ref. 55);
- The Natural Environment and Rural Communities (NERC) Act 2006 (Ref. 56);
- The Protection of Badgers Act 1992 (Ref. 57);
- The Hedgerows Regulations 1997 (Ref. 58); and
- The Water Environment (Water Framework Directive) (England and Wales) Regulations 2017 (Ref. 59).

National Planning Policy

- NPS EN-1 (Ref. 5) with particular reference to paragraphs 4.2.2 and 4.2.3, which provide national policy on what an ES for a NSIP project should contain, paragraph 4.3.1 which states what the SoS must, under the Habitats and Species Regulations (Ref. 55), consider when granting a development consent order and part 5 which sets out guidance on generic impacts for the applicant's assessment and decision-making on the application.
- NPS EN-3 (Ref. 6) with particular reference to paragraph 2.4.2, which underlines the importance of good design for energy infrastructure in respect of landscape, visual amenity, and in design of the project to mitigate impacts such as noise and effects on ecology.
- NPS EN-5 (Ref. 7) with particular reference to paragraph 2.8.9, which details what the SoS should consider when choosing an underground electricity line. This includes the impact on areas of natural beauty and the environmental consequences as underground cables can disturb sensitive habitats.
- NPPF (Ref. 8) – with particular reference to Section 170 to 177, which state that the planning system should contribute to and enhance the natural and local environment by minimising impacts on biodiversity and providing net gains in biodiversity where possible. The NPPF is clear that pursuing sustainable development includes moving from a net loss of biodiversity to achieving net gains for nature, and that a core principle for planning is that it should contribute to conserving and enhancing the natural environment and reducing pollution.

National Guidance

- Planning Practice Guidance, Natural Environment (Ref. 60) with particular reference to 'Biodiversity and ecosystems' and the related policy in paragraphs 8, 11, 170, 175, and 117.

Local Planning Policy

- East Cambridgeshire District Local Plan Adopted April 2015 (Ref. 9), with particular reference to Policy ENV 2: Design, Policy ENV 7: Biodiversity and geology, Policy ENV 9: Pollution, Policy ENV 10: Green Belt, Policy ENV 16: Enabling development associated with heritage assets, Policy COM 5: Strategic green infrastructure, and Policy SOH16: Green Lanes and Commons.
- East Cambridgeshire District Council SPD Renewable Energy Development (Commercial Scale) October 2014 (Ref. 11), with particular reference to Section 5: Biodiversity and geology.

- Forest Heath District Council Core Strategy Adopted 2010 (Ref. 12), with particular reference to Vision 1 Forest Heath, Spatial Objective ENV1, Policy CS 2 Natural Environment, Policy CS 4 Reduce Emissions, Mitigate and Adapt to future Climate Change, and Policy CS 13 Infrastructure and Developer Contributions.
- Forest Heath and St Edmundsbury Local Plan: Joint Development Management Policies Document (2015) (Ref. 13), with particular reference to Policy DM10 (Impact of Development on Sites of Biodiversity and Geodiversity Importance), Policy DM11 (Protected Species), Policy DM12 (Mitigation, Enhancement, Management and Monitoring of Biodiversity) and Policy DM13 (Landscape Features).

8.3.2 These policies identify the need for ecological surveys to inform the assessment of how biodiverse an area is and how much of an impact to biodiversity development will have on land within the Scheme Boundary and to areas surrounding the Scheme Boundary. In addition, they require the assessment to consider features of ecological interest and connectivity between habitats. The policies also identify measures to enhance biodiversity and adequately mitigate unavoidable impact on existing biodiversity.

8.3.3 With regards to enhancing and protecting biodiversity and connectivity, the policies require consideration of the impacts on biodiversity by assessing protected species and habitats that could be impacted by the Scheme. Particular attention to the habitats and species listed on the Cambridgeshire and Peterborough Biodiversity Action Plan (BAP) and Suffolk BAP is essential. Special consideration of sites of international, national and local importance is also necessary. Delivering a net gain and enhancing the network of habitats is also outlined in the policies.

Other Guidance

8.3.4 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. 61). The UK list of priority species and habitats, however, remains an important reference source and has been used to help draw up statutory lists of priority habitats and species in England, Scotland, Wales and Northern Ireland. For the purpose of this assessment, the UKBAP is still used as one of the criteria to assist in assigning national value to an ecological receptor.

8.3.5 The UK Post-2010 Biodiversity Framework (Ref. 61) sets a broad enabling structure for action across the UK between now and 2020, including a shared vision and priorities for UK-scale activities to help deliver the Aichi targets (Ref. 62) and the EU Biodiversity Strategy. A major commitment by Parties to the Convention of Biological Diversity is to produce a National Biodiversity Strategy and/or Action Plan. Biodiversity 2020 (Ref. 64) is England's strategy for wildlife and ecosystem services.

8.3.6 The UK Post-2010 Biodiversity Framework (Ref. 61) is relevant within England in the context of Section 40 of the NERC Act 2006 (Ref. 56), 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. This list encompasses 56 habitats and 943 species.

8.3.7 Local Biodiversity Action Plans include:

- Cambridgeshire and Peterborough Biodiversity Group Local Priority Habitats and Species (Ref. 65); and
- Suffolk Local Biodiversity Action Plan (Ref. 66).

8.3.8 For further details on any of the above policies and legislation, refer to the source document.

8.4 Baseline Conditions

8.4.1 The known or predicted ecological baseline conditions are summarised below.

Statutory Sites

8.4.2 Statutory sites that are designated for nature conservation were identified through a review of the Multi-Agency Geographic Information for the Countryside (MAGIC) (Ref. 67) website within the study areas set out in Section 8.2. These sites are shown on Figure 8-1 and summarised below in Table 8-1.

Table 8-1 Statutory Designated Sites

<i>Site Name</i>	<i>Status</i>	<i>Description</i>	<i>Distance and direction from closest point of the Scheme Boundary</i>
Chippenham Fen and Snailwell Poor's Fen	Fenland SAC, Chippenham Fen Ramsar / NNR, Chippenham Fen and Snailwell Poor's Fen SSSI	A spring-fed calcareous basin mire with a long history of management, which is partly reflected in the diversity of present-day vegetation. The invertebrate fauna is very rich, partly due to its transitional position between Fenland and Breckland. The site supports diverse vegetation types, rare and scarce plants. The Site is the stronghold of Cambridge Milk Parsley <i>Selinum carvifolia</i> .	Directly adjacent to the north of the Sunnica West Site (north).
Snailwell Meadows	SSSI	The meadows support a range of grassland community types ranging from dry calcareous pasture through wet neutral grassland to marshy grassland with acidic influences typical of fen edge pastures. Such community types are essentially southern in their national distribution and are rare in a Cambridgeshire context.	Directly adjacent to the south of the Sunnica West Site (north).
Brackland Rough	SSSI	A damp valley woodland, the site holds stands of Alder <i>Alnus glutinosa</i> , a woodland type rare in Cambridgeshire and becoming scarce throughout its natural range in lowland Britain.	Approximately 210m north of the cable route corridor for Grid Connection Route B and approximately 350m north of the Sunnica West Site (north).
Red Lodge Heath	SSSI	This site supports a nationally important assemblage of invertebrates, including nationally rare Five-banded Digger Wasp <i>Cerceris quinquefasciata</i> .	Approximately 640m south east of the Sunnica East Site.

<i>Site Name</i>	<i>Status</i>	<i>Description</i>	<i>Distance and direction from closest point of the Scheme Boundary</i>
Cherry Hill and The Gallops, Barton Mills	SSSI	Cherry Hill and The Gallops lie on calcareous soils at the southern edge of Breckland. The soil is a typical flinty, Breckland sand with fragments of chalk and unimproved calcareous grassland has developed on the wide roadside verges within the site. The species-rich grassland flora includes an outstanding assemblage of nationally rare plants.	Approximately 1060m east of the Sunnica East Site.
Newmarket Heath	SSSI	This site lies on the Middle Chalk near Newmarket. It is by far the largest expanse of unimproved chalk grassland remaining in Cambridgeshire. Newmarket Heath is of particular importance for the presence of areas of chalk heath, a rare vegetation type in Britain as a whole. This is the sole Cambridgeshire example and is of great geographical importance in providing a link between the Brecklands heaths and the chalk heaths of the Chilterns. There is a high diversity of flowering plants, including a large population of a nationally rare species listed in the British Red Data Book and at least five nationally uncommon species.	Approximately 1,090m south of the Sunnica West Site (south).
Breckland	Breckland SPA Breckland Forest SSSI Breckland Farmland SSSI (just outside 2km study area)	The site is used regularly by 1% or more of the UK breeding populations of Stone Curlew <i>Burhinus oediconemus</i> , Nightjar <i>Caprimulgus europaeus</i> and Woodlark <i>Lullula arborea</i> .	Approximately 1,410m north east of the Sunnica East Site.
Breckland	Breckland SAC	The site is designated primarily for its inland dunes, natural eutrophic lakes, European dry heaths and semi-dry grasslands, and also alluvial forests and great crested newts.	Approximately 3,360m east of the Sunnica East Site.
Wicken Fen	Wicken Fen Ramsar, Fenland SAC Wicken Fen SSSI, NNR (just outside 2km study area)	The site supports diverse vegetation types, rare and scarce plants. The site supports one species of British Red Data Book plant, Fen Violet <i>Viola persicifolia</i> , which survives at only two other sites in Britain. It also contains eight nationally scarce plants and 121 British Red Data Book invertebrates.	Approximately 2,130m north west of the cable route corridor for Grid Connection Route B and approximately 3,120m north west of the Burwell National Grid Substation Extension.

<i>Site Name</i>	<i>Status</i>	<i>Description</i>	<i>Distance and direction from closest point of the Scheme Boundary</i>
Rex Graham Reserve	SAC, SSSI	This long-disused chalk-pit supports the largest wild population of a nationally rare plant given special protection under Section 13 of the Wildlife and Countryside Act 1981.	Approximately 3,010m north east of the Sunnica East Site.
Devil's Dyke	Devil's Dyke SAC, SSSI	The Devil's Dyke holds one of the best and most extensive areas of species-rich chalk grassland in the county and a similarly extensive area of chalk scrub grading into woodland to the east.	Approximately 5,070m south west of the cable route corridor for Grid Connection B.

Non-statutory Sites

8.4.3 24 non-statutory sites designated for nature conservation were identified within 2 km of the Scheme Boundary. These sites have been designated as County Wildlife Sites (CWS) for their biodiversity value at a county level and are known to have supporting value to a wide variety of protected and ecologically important species and/or habitats. One site is designated as a Protected Road Verge (PRV) for its ecological importance. These sites are shown on Figure 8-2 and summarised in Table 8-2.

Table 8-2 Non-Statutory Designated Sites

<i>Site Name</i>	<i>Status</i>	<i>Description</i>	<i>Distance and direction from closest point of the Scheme Boundary</i>
Chippenham Avenue Fields	CWS	Two arable fields. Grass-poly <i>Lythrum hyssopifolia</i> (Nationally Rare vascular plant species) is found in about half a dozen hollows in the two fields.	The southern field of the CWS lies within the northern section of the Sunnica West Site (south).
Havacre Meadows and Deal Nook	CWS	This site contains semi-improved grassland, woodland, scrub and open water in close association. The site also contains willow carr of the National Vegetation Classification (NVC) Alder <i>Alnus</i> – Stinging Nettle <i>Urtica dioica</i> woodland community (W6).	The cable route corridor for Grid Connection Route A runs through the CWS.
Badlingham Lane	CWS	Verges within this site support species-rich flora characteristic of a breckland habitat including Sainfoin <i>Onobrychis</i> which is listed as near threatened within Suffolk's Rare Plant Register (SRPR). The site also supports a small population of Sand catchfly <i>Silene conica</i> , a plant listed in the Red Data Book and as nationally scarce within SRPR.	The CWS lies within the northern section of the Sunnica East Site.

<i>Site Name</i>	<i>Status</i>	<i>Description</i>	<i>Distance and direction from closest point of the Scheme Boundary</i>
Worlington Heath	CWS	The site contains lowland heathland (Priority habitat) and dry grassland that has had historical records of Marsh stitchwort <i>Stellaria palustris</i> (Priority species included within SRPR). Wet hollows within the site also support Bog pimpernel <i>Anagallis tenella</i> and Marsh speedwell <i>Veronica scutellata</i> (locally scarce and included within the SRPR). The site also contains small pockets of scrub and mature hedge (priority habitat).	The CWS lies within the northern section of the Sunnica East Site.
The Limekilns and Adjacent Areas	CWS	The site supports at least 0.05 ha of CG3 Upright Brome grassland and 0.05 ha of MG5 Crested Dog's-tail <i>Cynosurus cristatus</i> – Black Knapweed <i>Centaurea nigra</i> grassland. Also supports six or more strong calcareous grassland indicator species and a vascular plant species which is rare in the county.	The CWS is directly adjacent the Sunnica West Site (south) on the southern side of the A14.
Joan's Meadow	CWS	A lowland heathland site (biodiversity priority habitat) and a valuable example of short open breckland grassland. Species include Sickie medick <i>Medicago falcata</i> , Small scabious <i>Scabiosa columbaria</i> , Field mouse-ear <i>Cerastium arvense</i> and Basil thyme <i>Acinos arvensis</i> (included within SRPR the latter also being a biodiversity priority species). Lichens, butterflies, owls, House martin <i>Delichon urbicum</i> , Yellowhammer <i>Emberiza citrinella</i> (biodiversity priority species) and bats have all been associated with this site.	The CWS lies immediately adjacent to the northern section of the Sunnica East Site.
Worlington Golf Course and Surrounding Habitat	CWS	The site supports areas of considerable botanical interest and support a range of Breckland plants including Spanish catchfly <i>Silene otites</i> (biodiversity priority species) and Bastard toadflax <i>Comandra umbellata</i> (two nationally rare species). Other biodiversity priority species recorded on-site include rare-spring sedge <i>Carex ericetorum</i> and purple milk-vetch <i>Astragalus danicus</i> . Mixed woodland with dense shrub layer supports Nightingales <i>Luscinia megarhynchos</i> and Goldcrests <i>Regulus</i> . Additionally, arable field margins (biodiversity priority habitat) buffer the golf course along its eastern and south-western edges. Lowland heath/Breck grassland, pond/open water, hedge/scrub, marshy grassland, semi-natural and plantation woodland and wet woodland (biodiversity priority habitats) can be found on and neighbouring the golf course.	The CWS lies immediately adjacent to the northern section of the Sunnica East Site.

<i>Site Name</i>	<i>Status</i>	<i>Description</i>	<i>Distance and direction from closest point of the Scheme Boundary</i>
Snailwell Grasslands and Woods	CWS	The site forms a habitat mosaic more than ten hectares in size which contains three or more of the listed habitats in close association. The marshy grassland contains more than 0.05 ha of a good example of the NVC M22 Blunt-flowered Rush <i>Juncus subnodulosus</i> – Marsh Thistle <i>Cirsium palustre</i> community. The woodland contains approximately 0.5 ha of the NVC Alder – Stinging Nettle community.	The CWS lies immediately adjacent to the Sunnica West Site (north).
Chippenham Gravel Pit	CWS	The site supports populations of Nationally Scarce vascular plant species (Bearded Fescue <i>Vulpia ciliate</i> ssp. <i>Ambigua</i> , Fine-leaved Fumitory <i>Fumaria parviflora</i> and Bur Medick <i>Medicago minima</i>) and County Rare vascular plant species (Smooth Cat's-ear <i>Hypochaeris glabra</i> , Small Cudweed <i>Filago minima</i> and Clustered Clover <i>Trifolium glomeratum</i>). The site also qualifies as a Grade C Site in the Joint Nature Conservation Committee (JNCC) Invertebrate Site Register.	The CWS lies approximately 20m east of the cable route corridor for Grid Connection Route A.
Worlington Chalk Pit	CWS	The site supports a diverse flora typical of an herb-rich chalk grassland. Many of the species recorded here are rare in Suffolk such as Cat mint <i>Nepeta</i> , Night-flowering catchfly <i>Silene noctiflora</i> and Basil thyme all of which are included within SRPR and the latter is also a biodiversity priority species. Broad-leaved cudweed <i>Filago pyramidata</i> also recorded here is a biodiversity priority species, included with the SRPR and considered endangered and only found in this location. Invertebrate interest is high and of particular note are the Scarce-four-dot pin-palp beetle <i>Bembidion quadripustulatum</i> and Cinnabar moth <i>Tyria jacobaeae</i> , both of which are biodiversity priority species.	The CWS lies approximately 30m south east of the Sunnica East Site.
Barton Mills Chalk Pit	CWS	This active chalk quarry and landfill site supports calcareous grassland, a scarce and decreasing (biodiversity priority) habitat in Suffolk. Additionally, records of Basil thyme (biodiversity priority species) have been recorded here.	The CWS lies approximately 40m east of the Sunnica East Site.
Chippenham Park	CWS	The site contains more than 0.05 ha of NVC Common Knapweed – Crested Dog's-tail grassland community and pasture woodland with more than five mature and over mature trees per hectare. The grassland also meets species richness criteria, with frequent numbers of eight neutral grassland indicators.	The CWS lies approximately 90m north west of the Sunnica West Site (south).

<i>Site Name</i>	<i>Status</i>	<i>Description</i>	<i>Distance and direction from closest point of the Scheme Boundary</i>
Red Lodge Warren	CWS	The site supports a valuable Breckland grassland community that includes Purple fescue <i>Vulpia ciliata</i> var. <i>ambigua</i> , a nationally scarce plant (recorded in 15-100 km squares in the UK).	The CWS lies approximately 290m south of the Sunnica East Site.
Old Rectory Meadows	CWS	The site supports frequent numbers of at least 8 neutral grassland indicator species.	The CWS lies approximately 420m west of the Sunnica West Site (south).
Burwell Brick Pit	CWS	The site supports naturally regenerating grasslands, scrub, marshy, grassland, swamp and open water.	The CWS lies approximately 680m north east of the cable route corridor for Grid Connection Route B.
New River and Monk's Lode	CWS	The site supports more than 10 submerged, floating, emergent and wet bank species per 20 m stretch. Also both ends of the site are well managed and continue to display a good flora that meets the qualifying criteria.	The CWS lies approximately 690m north of Grid Connection B.
Snailwell (S of the stud to the railway)	PRV	Neutral / calcareous grassland, presence of a local red data book species.	The PRV is located approximately 690m west of the Sunnica West Site (south).
Halfmoon Plantation Pit	CWS	The site supports populations of Nationally Rare Smooth Rupturewort <i>Herniaria glabra</i> , Nationally Scarce vascular plant species and rare county vascular plant species.	The CWS lies approximately 780m east of the cable route corridor for Grid Connection Route A.
Norah Hanbury-Kelk Memorial Meadows	CWS	The sites provide suitable conditions for a rich assemblage of wetland wildlife. Snipe <i>Gallinago</i> , Gadwall <i>Mareca strepera</i> , Lapwing <i>Vanellus</i> and Redshank <i>Tringa tetanus</i> breed here. Of particular value on this site is a colony of Early marsh orchid <i>Dactylorhiza incarnata</i> , an uncommon plant in Suffolk and a biodiversity priority species. Other biodiversity priority species include, Reed bunting <i>Emberiza schoeniclus</i> , Common bullfinch <i>Pyrrhula</i> , Yellowhammer, Common toad <i>Bufo</i> , Grass snake <i>Natrix</i> and Water vole <i>Arvicola amphibious</i> .	The CWS lies approximately 1,140m north of the Sunnica East Site.
Spring Close	CWS	The site supports frequent numbers of at least 8 neutral grassland indicator species.	The CWS lies approximately 1,370m south east of the cable route corridor for Grid Connection Route B.

<i>Site Name</i>	<i>Status</i>	<i>Description</i>	<i>Distance and direction from closest point of the Scheme Boundary</i>
Pauline's Swamp	CWS	The site contains at least 0.25 ha of the NVC Meadowsweet <i>Filipendula ulmaria</i> – Wild Angelica <i>sylvestris</i> mire community (M27). It also has a pond with beds of Stoneworts <i>Charales</i> .	The CWS lies approximately 1,740m south of the cable route corridor for Grid Connection Route B.
Barton Mills Meadows	CWS	The site supports a rich assemblage of wetland plants including the Scarce adder's-tongue fern <i>Ophioglossum vulgatum</i> , Heath spotted orchid <i>Dactylorhiza maculata</i> , Water avens <i>Geum rivale</i> and Early marsh orchid (the latter included within SRPR and considered locally scarce). The site also supports 38 species of moth including eight biodiversity priority species.	The CWS lies approximately 1,850m north east of the Sunnica East Site.
RNR 96	CWS	Wild Grape Hyacinth <i>Muscari neglectum</i>	The CWS lies approximately 1,920m east of the Sunnica East Site.
Burwell Disused Railway	CWS	The site contains at least 0.05 ha of the NVC Upright Brome <i>Bromus erectus</i> grassland community (CG3) and supports a population of a Nationally Rare vascular plant species. Additionally it also supports frequent numbers of at least 6 strong and 16 strong or weak calcareous grassland indicator species. The site also supports one of the five largest colonies in the county of nationally declining Small Blue <i>Cupido minimus</i> and Chalk-hill Blue <i>Polyommatus coridon</i> butterflies.	The CWS lies approximately 1,930m south of the cable route corridor for Grid Connection Route B.

Habitats

8.4.4 Priority habitats listed under Section 41 of the NERC Act 2006 (Ref. 56), which are present or likely to be present (where determination by further survey is required) within the Scheme Boundary, include: arable field margins, hedgerows, lowland heathland, lowland dry acid grassland, lowland mixed deciduous woodlands, wet woodlands, lowland fens, reedbeds, rivers and streams, and standing water (ponds and reservoirs). These habitats have potential to support a range of protected and notable species.

Species

8.4.5 The desk study identified records of 206 protected or notable species of flora and fauna within the study area. These include:

- 71 flowering plant species;
- 3 amphibian species (Great Crested Newt *Triturus cristatus*, Common Frog *Rana temporaria*, and Common Toad *Bufo bufo*);
- 70 bird species, including Barn Owl *Tyto alba*, Stone Curlew *Burhinus oedicnemus*, Nightjar *Caprimulgus europaeus* and Woodlark *Lullula arborea*
- 44 invertebrate species;

- 2 reptile species (Common Lizard *Zootoca vivipara* and Grass Snake *Natrix natrix*);
- 13 bat species; and
- 6 notable mammal species (Brown Hare *Lepus europaeus*, Eurasian Badger *Meles*, Eurasian Water Shrew *Neomys fodiens*, European Otter *Lutra*, European Water Vole *Arvicola amphibius*, and West European Hedgehog *Erinaceis europaeus*).

8.4.6 These species are offered full or part protection under the Wildlife and Countryside Act 1981 (Ref. 53). Several species recorded within the study area are also listed on the UK Biodiversity Action Plan (UKBAP); on Section 41 of the NERC Act 2006 (Ref. 56) as being of priority conservation concern; on the Suffolk Biodiversity Action Plan (Ref. 66) or as a Cambridgeshire and Peterborough Priority Species (Ref. 65). Full details of these species and their legal status and conservation value will be provided in the ES.

Additional Survey Requirements

8.4.7 The PEA, which consists of a Phase 1 Habitat Survey (following the established JNCC methodology, Ref. 68) and Protected Species Scoping Survey, will confirm the requirements for further surveys to support the ecology, biodiversity and nature conservation impact assessment, but these are likely to include the following:

- Botanical surveys including for any invasive non-native plant species, hedgerows and river habitats and corridors;
- Aquatic invertebrate surveys including for any invasive non-native species;
- Terrestrial invertebrate surveys;
- Reptile presence / absence surveys;
- Habitat Suitability Index (HSI) assessment and Great Crested Newt eDNA surveys at ponds identified on and within 500m of the Scheme;
- Great Crested Newt population size surveys (where applicable);
- Breeding bird surveys, including targeted surveys for Barn Owl, Stone Curlew, Nightjar and Woodlark;
- Wintering bird surveys;
- Preliminary bat roost feature assessment of buildings and structures and tree climbing surveys for bats (where applicable);
- Bat activity surveys;
- Dusk emergence and dawn return surveys of buildings, structures and trees (if applicable);
- Badger surveys; and
- Riparian mammal surveys (Otter and Water Vole).

8.4.8 The surveys undertaken will inform the Habitats Regulation Assessment (HRA). A HRA Screening Report will be prepared under the Conservation of Habitats and Species Regulations 2017 (Ref. 55). The HRA Screening Report will be provided with the DCO application, together with sufficient information to enable the Examining Authority and SoS to make an appropriate assessment, if the Screening Report indicates that further assessment work for HRA is required.

8.4.9 The surveys undertaken will also inform European Protected Species (EPS) mitigation licences prepared in draft for advisory comment from Natural England, all of which will form part of the DCO application for the Scheme.

8.4.10 A habitat conditions assessment will also be carried out on land within the Scheme Boundary in order to perform a biodiversity net-gain assessment. The baseline information gathered from this, and other surveys, will be used to develop an appropriate strategy in line with the policies identified in Section 8.3.

8.5 Potential Effects and Mitigation

Construction and Decommissioning

8.5.1 There is the potential for the following construction and decommissioning impacts on important ecological features:

- Habitat loss: direct loss, fragmentation and severance of wildlife habitats through land take in various locations with potential to affect various species;
- Direct disturbance of, and harm to, animals, including the displacement of species from the proximity of the Scheme;
- Spread of invasive species either from or onto the land within the Scheme Boundary; and
- Indirect impacts, such as watercourse pollution, sedimentation and dust deposition, lighting of sensitive habitats and increased human disturbance.

Operation

8.5.2 The operation of the Scheme may result in significant effects on important ecological features and these effects include:

- Disturbance / displacement of species during operational maintenance;
- Lighting of sensitive habitats (recognising that, in relation to security lighting, as described in Paragraph 2.3.43, no areas are proposed to be continuously lit); and
- Management and maintenance of on-site and adjacent habitats.

8.5.3 These effects are concerned with the operation of the Sunnica East Site and Sunnica West Site, and the Burwell National Grid Substation Extension,. The cables will be laid underground, and no operational effects are anticipated with this element of the Scheme.

8.6 Assessment Methodology

8.6.1 The approach used for the ecological impact assessment (EclA) will be undertaken in accordance with best practice guidance issued by the Chartered Institute of Ecology and Environmental Management (CIEEM) in 2018 (Ref. 69), as summarised below. The aims of the EclA will be to:

- Identify relevant ecological features (*i.e.* designated sites, habitats, species or ecosystems) which may be impacted;
- Provide a scientifically rigorous and transparent assessment of the likely ecological impacts and resultant effects of the Scheme; impacts and effects may be beneficial (*i.e.* positive) or adverse (*i.e.* negative);
- Facilitate scientifically rigorous and transparent determination of the consequences of the Scheme in terms of national, regional and local policies relevant to nature conservation and biodiversity, where the level of detail provided is proportionate to the scale of the development and the complexity of its potential impacts; and
- Set out what steps will be taken to adhere to legal requirements relating to the relevant ecological features concerned.

8.6.2 The principal steps involved in the EclA can be summarised as follows:

- Ecological features that are both present and might be affected by the Scheme are identified (both those likely to be present at the time works begin and those predicted to be present at a set time in the future) through a combination of targeted desk-based study and field survey work to determine the relevant baseline conditions;

- The importance of the identified ecological features evaluated, placing their relative biodiversity and nature conservation value into geographic context. This is then used to define the relevant ecological features that need to be considered further within the assessment process;
- The changes or perturbations predicted to result as a consequence of the Scheme (*i.e.* the potential impacts), and which could potentially affect relevant ecological features are identified and their nature described. Established good-practice, legislative requirements or other incorporated design measures to minimise or avoid impacts are also described and are taken into account;
- The likely effects (beneficial or adverse) on relevant ecological features are then assessed, and where possible quantified;
- Measures to avoid or reduce any predicted significant effects, if possible, are then developed in conjunction with other elements of the design (including mitigation for other environmental disciplines). If necessary, measures to compensate for effects on features of nature conservation importance are also included;
- Any residual effects of the Scheme are reported; and
- Scope for ecological enhancement is considered.

8.6.3 It is not necessary in the assessment to address all habitats and species with potential to occur in the study area and instead the focus should be on those that are 'relevant', *i.e.* ecological features that are considered to be important and potentially affected by the Scheme. In its guidance, CIEEM (Ref. 69) makes clear that there is no need to *"carry out detailed assessment of ecological features that are sufficiently widespread, unthreatened and resilient to project impacts and will remain viable and sustainable"*. This does not mean that efforts should not be made to safeguard wider biodiversity, and requirements for this will be considered. National policy documents emphasise the need to achieve net gains for nature and that a core principle for planning is that it should contribute to conserving and enhancing the natural environment and reducing pollution.

8.6.4 To support focussed ecological impact assessment, there is a need to determine the scale at which the relevant ecological features identified through the desk studies and field surveys undertaken for the Scheme are of value. The value of each relevant ecological feature will be defined with reference to the geographical level at which it matters. The frames of reference used for this assessment, based on CIEEM guidance (Ref. 69), will be:

- International (generally this is within a European context, reflecting the general availability of good data to allow cross-comparison);
- National (Great Britain, but considering the potential for certain ecological features to be more notable (of higher value) in England, with context relative to Great Britain as a whole);
- Regional (East England);
- County (Cambridgeshire and Suffolk);
- District (East Cambridgeshire and Forest Heath); and
- Local (has value at the 'Site' level).

8.6.5 Species populations are valued on the basis of their size, recognised status (such as through published lists of species of conservation concern and designation of Biodiversity Action Plan (BAP) status), and legal protection.

8.6.6 In assigning values to species populations, it is important to take into account the status of the species in terms of any legal protection. However, it is also important to consider other factors such as its distribution, rarity, population trends and the size of the population which would be affected. For example, whilst the Great Crested Newt is protected under European law, and therefore conservation of the species is of significance at an international level, this does not mean that every population of Great Crested Newt is internationally important. It is important to consider the particular population in its context. Therefore, in assigning values to

species, the geographic scale at which they are important will be considered. The assessments of value rely on the professional opinion and judgment of experienced ecologists.

- 8.6.7 Plant communities will be assessed both in terms of their intrinsic value, and as habitat for protected species whose habitat is also specifically protected, and for species of nature conservation concern which are particularly associated with them.
- 8.6.8 Due regard will also be paid to the legal protection afforded to species during the development of mitigation and compensation measures to be implemented as part of the Scheme. For European protected species, there is a requirement that the Scheme should not be detrimental to the maintenance of the population of the species concerned at a favourable conservation status in their natural range.
- 8.6.9 Assessing the value of features requires consideration of both existing and future predicted baseline conditions. Therefore, the description and valuation of ecological features will take account of any likely changes, such as trends in the population size or distribution of species, likely changes to the extent of habitats and the effects of other schemes or land use changes.
- 8.6.10 In line with the CIEEM guidelines (Ref. 69), the terminology used within the EclA will draw a clear distinction between the terms 'impact' and 'effect'. For the purposes of this EclA these terms are defined as follows:
- **Impact** – actions resulting in changes to an ecological feature. For example, construction activities of a development removing a hedgerow; and
 - **Effect** – outcome resulting from impact acting upon the conservation status or structure and function of an ecological feature. For example, the effects on a population of bats as a result of the loss of a bat roost.
- 8.6.11 When describing potential impacts (and where relevant the resultant effects) consideration will be given to the following characteristics likely to influence this:
- **Beneficial / adverse** – i.e. is the change likely to be in accordance with nature conservation objectives and policy:
 - **Beneficial** – a change that improves the quality of the environment, or halts or slows an existing decline in quality e.g. increasing the extent of a habitat of conservation value; or
 - **Adverse** – a change that reduces the quality of the environment, e.g. destruction of habitat.
 - **Spatial extent** – the spatial or geographical area or distance over which the impact/effect occurs;
 - **Magnitude** – the 'size', 'amount' or 'intensity' and 'volume' of an impact - this is described on a quantitative basis where possible;
 - **Duration** – the time over which an impact is expected to last prior to recovery or replacement of the resource or feature. Consideration has been given to how this duration relates to relevant ecological characteristics such as a species' lifecycle. However, it is not always appropriate to report the duration of impacts in these terms. The duration of an effect may be longer than the duration of an activity or impact;
 - **Timing and frequency** – i.e. consideration of the point at which the impact occurs in relation to critical life-stages or seasons; and
 - **Reversibility** – i.e. is the impact temporary or permanent. A temporary impact is one from which recovery is possible or for which effective mitigation is both possible and enforceable. A permanent effect is one from which recovery is either not possible, or cannot be achieved within a reasonable timescale (in the context of the feature being assessed).
- 8.6.12 Cumulative effects will be assessed and are those occurring from several sources (also known as inter-relationships) and/or the combined effects of other developments in the area.

8.6.13 For each ecological feature only those characteristics relevant to understanding the ecological effect and determining the significance will be described. The determination of the significance of effects has been made based on the predicted effect on the structure and function, or conservation status, of relevant ecological features, as follows:

- **Not significant** - no effect on structure and function, or conservation status; and
- **Significant** - structure and function, or conservation status is affected.

8.6.14 CIEEM guidance (Ref. 69) states that effects should be determined as being significant when:

“an effect either supports or undermines biodiversity conservation objectives for ‘important ecological features’ or for biodiversity in general. Conservation objectives may be specific (e.g. for a designated site) or broad (e.g. national/local nature conservation policy) or more wide-ranging (enhancement of biodiversity). Effects can be considered significant at a wide range of scales from international to local. A significant effect is an effect that is sufficiently important to require assessment and reporting so that the decision maker is adequately informed of the environmental consequences of permitting a project. In broad terms, significant effects encompass impacts on structure and function of defined sites, habitats or ecosystems and the conservation status of habitats and species (including extent, abundance and distribution)”.

8.6.15 Using this information and judgment, it is determined whether the effects will be significant or not on the integrity (of site / ecosystems) or conservation status (of habitats / species) of each ecological feature and the impact significance is determined at the appropriate geographical scale.

8.6.16 In order to provide consistency of terminology, the findings of the CIEEM assessment will be translated into the classification of effects scale, as outlined in Table 8-3.

Table 8-3 Relating CIEEM assessment terms to those used in other EIA chapters

<i>Effect classification terminology used in other EIA chapters</i>	<i>Equivalent CIEEM assessment</i>
Major beneficial	Beneficial effect on structure / function or conservation status at regional, national or international level.
Moderate beneficial	Beneficial effect on structure/ function or conservation status at County level.
Minor beneficial	Beneficial effect on structure / function or conservation status at Local level.
Neutral / Negligible	No effect on structure / function or conservation status.
Minor adverse	Adverse effect on structure / function or conservation status at Local level.
Moderate adverse	Adverse effect on structure / function or conservation status at County level.
Major adverse	Adverse effect on structure / function or conservation status at Regional, National or International level.

8.7 Assumptions, Limitations and Uncertainties

8.7.1 The following assumptions and limitations have been noted during the scoping:

- Baseline ecological surveys commenced in 2018 and will continue through 2019 to determine the baseline ecological conditions. The surveys may highlight new important ecological features with potential to be significantly affected which have not been identified (or considered not to be significant) at this stage of the assessment.
- A precautionary approach has been taken at this stage which assumes that all habitats within the footprint of the solar PV modules and associated solar and battery storage infrastructure will be permanently lost during construction.
- It is currently assumed that should there be the requirement for the potential mitigation of ecological features and recommended enhancement measures, suitable on-site areas will be made available to deliver the required outcomes.

9. Flood Risk, Drainage and Surface Water

9.1 Introduction

9.1.1 This chapter relates to the potential effects of the Scheme on the surface water bodies (e.g. rivers, streams, ditches, canals, lakes and ponds, etc) including water quality and hydromorphology, as well as flood risk and drainage. It considers the potential for likely significant effects of the Scheme on the surface water environment, the scope for mitigation, and how it is proposed to assess the significance of these potential effects.

9.2 Study Area

9.2.1 A study area of approximately 1 km from the Scheme Boundary has been considered in order to identify surface water bodies that could reasonably be affected by the Scheme. However, the baseline assessment has also considered a wider study area of up to 2 km downstream of the Scheme Boundary where watercourse flow impacts may propagate downstream (in terms of water quality and flood risk).

9.3 Planning Policy Context and Guidance

9.3.1 A summary of the legislation, planning policy and guidance relevant to the assessment of impacts of the Scheme on the water environment is presented in this section.

Legislation

9.3.2 The main legislation relevant to the Scheme include the following (please note that details of European Directives are not included, just the national legislation that transposes them):

- Water Act 2014 (Ref. 70);
- Floods and Water Management Act 2010 (Ref. 71);
- Land Drainage Act 1991 (as amended) (Ref. 72);
- Water Resources Act 1991 (as amended) (Ref. 73);
- Salmon and Freshwater Fisheries Act 1975 (as amended) (Ref. 74);
- Water Environment (Water Framework Directive) (England and Wales) Regulations 2017 (Ref. 59);
- Environmental Damage (Prevention and Remediation) Regulations 2015 (0);
- Environmental Permitting (England and Wales) Regulations 2016 (Ref. 76);
- Groundwater (England and Wales) Regulations 2009 (Ref. 77);
- Eels (England and Wales) Regulation 2009 (Ref. 78); and
- Control of Pollution (Oil Storage) (England) Regulations 2001 (Ref. 79).

National Planning Policy

9.3.3 The following planning policies have been taken into account as part of identifying the assessment methodology, receptor selection/sensitivity, potential significant environmental effects, and mitigation:

- NPS EN-1 (Ref. 5) with particular reference to paragraphs 5.91 to 5.95, 5.97, 5.110 to 5.114 in relation to flood risk and paragraphs 5.219 to 5.223, 5.226 and 5.228 to 5.231 in relation to water quality and resources;

- NPS EN-3 (Ref. 6) – although this NPS does not cover solar developments, this document highlights the importance of considering potential impacts on water quality, water resources and flood risk, taking into account climate change;
- NPS EN-5 (Ref. 7), with particular reference to Section 2.4: Climate Change Adaptation; and
- NPPF (Ref. 8) with particular reference to paragraphs 8 (a and b), 20(b), 149, 155-165 in relation to flood risk and paragraphs 8(c), 20(d), 149, and 170 (e) regarding water quality.

National Guidance

- Planning Practice Guidance, Flood Risk and Coastal Change (Ref. 80), and Water Supply, Wastewater and Water Quality (Ref. 81).

Local Planning Policy

- East Cambridgeshire District Council Local Plan Adopted April 2015 (Ref. 9), with particular reference to Policy ENV 8 (Flood Risk);
- East Cambridgeshire District Council SPD Renewable Energy Development (Commercial Scale) October 2014 (Ref. 11), with particular reference to Policy CS6: Environment, noting opportunities to limit water pollution, improve water quality, and minimised flooding, and Policy EN8: Pollution;
- Forest Heath District Council Core Strategy Adopted 2010 (Ref. 12), with particular reference to Policy CS-4 (Reduce Emissions, Mitigate and Adapt to future Climate Change) and Spatial Objective ENV2; and
- Forest Heath and St Edmundsbury Local Plan: Joint Development Management Policies Document (last updated February 2015) (Ref. 13), with particular reference to Policy DM6 Flooding and Sustainable Drainage and DM14 Protecting and Enhancing Natural Resources, Minimising Pollution and Safeguarding from Hazards.

9.3.4 These policies identify the need for a site specific flood risk assessment to inform the assessment of flood risk from all types of flooding to and from the development. They require the assessment to consider the vulnerability of users of the proposed infrastructure, consider the impacts of climate change and confirm whether flood risk is increased elsewhere. In addition, local flood risk management strategies and surface water management plans should be considered when assessing local flood risk. The policies also identify measures to mitigate flood risk through sustainable surface water management.

9.3.5 With regard to water quality and water resources, the policies require consideration of the impacts of pollution from development on the water environment by assessing, water bodies, protected areas under the Water Framework Directive (WFD) (Ref. 59), safeguard zones, water protection zones, source protection zones around potable groundwater abstractions and ecological sites. The policies also encourage mitigation of pollution on the water environment through careful design to facilitate good pollution control practice.

9.3.6 Consideration will also be given to UK Government's 25 Year Environment Plan (Ref. 82), the UK Government's Future Water Strategy (2011) (Ref. 83), Non-statutory technical standards for Sustainable Drainage Systems (SuDS) (Ref. 84), Building Regulations 2010 Approved Document H: Drainage and Waste Disposal (Ref. 85), BRE Digest 365: Soakaway Design and Sewers for Adoption (7th Edition, 2012) (Ref. 25).

9.3.7 At a regional level, water management is coordinated through 10 River Basin Management Plans (RBMPs). Each RBMP is prepared by the Environment Agency for six year cycles and set out how organisations, stakeholders and communities will work together to improve the water environment. The most recent plans were published in 2015 (the second cycle) and will remain in place until after 2021. The waterbodies within the study area fall under the Anglian RBMP (Ref. 86).

9.3.8 Finally, the following Strategic Flood Risk Assessments (SFRA) are available for the development Sites, and will be reviewed in full:

- Sunnica East Site – East Cambridgeshire District Council SFRA (Ref. 87); and
- Sunnica West Site – Forest Heath District Council SFRA (Ref. 88).

9.3.9 An SFRA is a study carried out by one or more local planning authorities to assess the risk to an area from flooding from all sources, now and in the future, taking account of the impacts of climate change, and to assess the impact that land use changes and development in the area will have on flood risk.

9.4 Baseline Conditions

9.4.1 Baseline information has been reviewed in the context of the Scheme in order to identify the potential for significant effects based on a source-pathway-receptor model and where relevant, consideration has been given to the scope for mitigation. Figures 9-1 and 9-2 present surface water bodies and groundwater features respectively.

9.4.2 The surface water environment baseline conditions have been determined by a desk study of available information, and various other online data sources including:

- Online Ordnance Survey (OS) maps viewed to identify any surface water bodies within 1 km of the Scheme (Ref. 89);
- Online aerial photography (Ref. 90 and Ref. 91);
- Part 1: Anglian river basin district river basin management plan (Ref. 86);
- Environment Agency Catchment Data Explorer tool (Ref. 92);
- British Geological Survey (BGS) Borehole and Geology Mapping (Ref. 93);
- Environment Agency Online Interactive Maps (Ref. 94);
 - Flood map for planning (rivers and sea);
 - Risk of flooding from surface water;
 - Risk of flooding from reservoirs; and
 - Flood warning areas and risk.

9.4.3 Further review of existing geological plans, hydrogeological data and site investigation data will be carried out to provide a preliminary assessment of local ground and groundwater conditions. Summarised data will be recorded and provided within the FRA, and will be used to inform the Surface Water Drainage Strategy. The FRA will form a technical appendix to the ES.

9.4.4 In addition, further information and data will be obtained from the Environment Agency to undertake the impact assessment and will be presented in the ES. This will include water quality, resources (pollution incidents, abstraction licences and discharge consents) and fisheries data.

Flood risk from all sources

9.4.5 Tables 9-1 and 9-2 below summarises the flood risk from all sources for both the Sunnica East Site and Sunnica West Site. The cable route corridors for Grid Connection Route A and Grid Connection Route B cross areas of Flood Zone 2 and 3, particularly where they cross watercourses, and to the west of Burwell. In addition, the Burwell National Grid Substation Extension is within Flood Zone 2 and 3. The grid connection will be buried and flood protected, and therefore is not susceptible to flood risk and will not be considered in the ES.

Table 9-1 Flood risk from all sources (Sunnica East Site)

<i>Flood Risk Source</i>	<i>Comments</i>
Fluvial	The Sunnica East Site is within Flood Zone 1, according to the Gov.uk website (Ref. 94). The SFRA notes an area to the north east of the Sunnica East Site along a small ordinary watercourse with a fluvial flood risk. This is a low spot on the Sunnica East Site, where the local Newmarket Road bisects it.
Surface Water	The Forest Heath District Council SFRA mapping (Ref. 88) and the GOV.uk Flood risk from surface water mapping (Ref. 94), indicates patches of the Sunnica East Site which are susceptible to surface water flooding; however, flooding is localised and genially shallow (low risk). One location, shown on Figure 9-1 within the central area of the Sunnica East Site is shown to have a potential high risk.
Groundwater	According to the Forest Heath District Council SFRA mapping (Figure SFRA-01, Rev 2) (Ref. 88), there are no records of groundwater flooding across the Sunnica East Site, or in the vicinity. The Suffolk Preliminary Flood Risk Assessments (Ref. 95) indicate that the Sunnica East Site is not at risk of groundwater flooding. However, it was noted during site visits that groundwater may be shallow, so groundwater may have a reasonably consistent level.
Sewers	To date there are no sewer records available to note potential sewers in the vicinity of the Sunnica East Site. The Forest Heath Water Cycle Study (Ref. 96) has no records of flooding near the Sunnica East Site. In lieu of sewer asset plans, the risk of flooding from sewers is considered low.
Reservoirs	The Sunnica East Site is not within or near any registered reservoirs (assumed with volumes >10,000m ³). The Sunnica East Site is at very low risk of flooding from reservoirs.

Table 9-2 Flood risk from all sources (Sunnica West Site)

<i>Flood Risk Source</i>	<i>Comments</i>
Fluvial	The north eastern boundary of the Sunnica West Site (south) follows an ordinary watercourse, and the north eastern corner is at risk of fluvial flooding (Zones 2 and 3). Flood depths would likely be shallow due to the relatively flat topography of the area. The remainder of the Sunnica West Site (south) is within Flood Zone 1. The western boundary of the Sunnica West Site (north) follows the River Snail and the north western corner is within Flood Zones 2 and 3.
Surface Water	The East Cambridgeshire District Council SFRA mapping (Ref. 87) and the GOV.uk Flood risk from surface water mapping (Ref. 94), indicates patches of the Sunnica West Site which are susceptible to surface water flooding; however, flooding is very localised and genially shallow (low risk). The majority of the Sunnica West Site is at very low risk of surface water flooding.
Groundwater	The East Cambridgeshire District Council SFRA mapping (Ref. 87) indicates areas across the Sunnica West Site with varying groundwater flood risk. The central and western parts of the Sunnica West Site (south) that coincide with lower topography levels have up to 75% chance of groundwater flooding. However, there are no known records of groundwater flooding in this locale to date (SFRA and SWMP). The remainder of the Sunnica West Site has between 25 and 75% chance of groundwater flooding.

<i>Flood Risk Source</i>	<i>Comments</i>
Sewers	To date there are no sewer records available to note potential sewers in the vicinity of the Sunnica West Site. The Anglian Water DG5 register was not available at the time of writing the 2017 Level 1 and 2 SFRA report (Ref. 87). In lieu of sewer asset plans, the risk of flooding from sewers is considered low.
Reservoirs	The Sunnica West Site is not within or near any registered reservoirs (assumed with volumes >10,000m ³). The Sunnica West Site is at very low risk of flooding from reservoirs.

Topography, Land Use, Climate and Geology

- 9.4.6 The topography of the area is relatively flat, with existing ground levels approximately 10m Above Ordnance Datum (AOD) according to online Ordnance Survey mapping (Ref. 89). The Site is currently used mainly for agriculture.
- 9.4.7 Based on the Meteorological Office website (Ref. 97), the nearest weather station is located at Isleham (TL 64485 74065), approximately 6km north of the Scheme. Using data from this weather station, it is estimated that the study area experiences an average of approximately 630mm of rainfall per year, with it raining more than 1mm on approximately 116 days per year, which are both low in the UK context. This is relevant to the whole study area.
- 9.4.8 The bedrock and superficial geology for the area is identified by the BGS online mapping (Ref. 93). The bedrock consists of a mix of Zig Zag Chalk Formation (west area) and Holywell Nodular Chalk Formation and New Pit Chalk Formation (undifferentiated) (east area) – Chalk, of sedimentary origin.
- 9.4.9 Superficial deposits are mainly River Terrace Deposits – Sand And Gravel, of fluvial origin, with small sections of:
- Head - Clay, Silt, Sand And Gravel and Blown Sand – Sand of aerial origin in the Sunnica East Site;
 - Alluvium - Clay, Silt, Sand And Gravel around the Main Rivers; and
 - Peat in the Chippenham Fen area, south of Fordham, and north-west of Burwell in the Little Fen area.
- 9.4.10 According to MAGIC Map (Ref. 67), the superficial aquifer is a mixture of Secondary A and Secondary (undifferentiated) while the bedrock aquifer is designated as Principal.
- 9.4.11 There is a Groundwater Source Protection Zone (SPZ) 2 and 3 around the Sunnica East Site and SPZ 3 north-east of the Sunnica East Site⁶. There are no Drinking Water Safeguard Zones (DWSZ) either surface or groundwater within the study area. The nearest DWSZ is over 2km northeast from the Sunnica East Site.

Surface Water

- 9.4.12 The Scheme is located within the Cam and Ely Ouse Management catchment of the Anglian RBMP (Ref. 86). The Sunnica East Site and Sunnica West Site are within the Lark operational catchment, with the cable routes passing westwards into the Cam and Ely Ouse operational catchment.

⁶ Source Protection Zones are defined as Inner (Zone 1), Outer (Zone 2) and Total Catchment (Zone 3). These are classified based on the time it takes for water to migrate from the edge of the zone to the abstraction. These being Zone 1 as 50 days travel time or less, Zone 2 as 400 days travel time or less, and Zone 3 as the total catchment area.

Sunnica East Site

- 9.4.13 The Sunnica East Site is located within four separate WFD catchments, with portions of the Sunnica East Site located within the 'Lark downstream Mill Street Bridge' waterbody (the majority of the central and eastern part of the Sunnica East Site), the 'River Kennett – Lee Brook' waterbody (upstream of Freckenham – water body GB105033042990) (the northwest area), and the 'River Kennett – Lee Brook' waterbody (downstream of Freckenham – water body GB105033043020) (the south western areas). The River Kennett is designated as a Main River and flows south and west of the Sunnica East Site to the River Lark, which is also designated as a heavily modified water body under the WFD. Within the northern area of the Sunnica East Site, there is a small pond area, and a tributary that flows northwards to the River Lark.

Sunnica West Site

- 9.4.14 The Sunnica West Site (south) is within the Lee Brook catchment, with Lee Brook rising along the northern edge of the land parcel. Lee Brook is an Ordinary watercourse and is also designated as a heavily modified water body under the WFD (water body GB105033042970). This watercourse flows in northerly direction for 3.5km to its confluence with the River Kennett.
- 9.4.15 The Sunnica West Site (north) is adjacent to the River Snail, with the Chippenham Fen SSSI / NNR / SAC / Ramsar to the north. These ecological sites are associated with wet ground and are considered to be a Groundwater Dependent Terrestrial Ecosystem (GWDTE). There are small ponds and various ditches on the designated site that drain to the River Snail. The River Snail is a Main River and designated under the WFD as part of Soham Lode WFD water body (reference GB105033042860). There is also a trout farm including a series of small ponds at a site within Snailwell, although this receptor appears to be upstream of the Scheme Boundary.

Cable Route Corridor

- 9.4.16 There are numerous small ponds, reservoirs and drains within the study area, mainly associated with local farms and drainage of agricultural fields. The sections below describe surface water bodies within the cable route corridors for Grid Connection Route A and Grid Connection Route B.

Grid Connection Route A

- 9.4.17 The cable route corridor for Grid Connection Route A passes between the Sunnica West Site (south) and Sunnica East Site. The route from the Sunnica West Site (south) is parallel to Lee Brook WFD waterbody, and passes northeast across agricultural land towards the Sunnica East Site. Prior to going into the Sunnica East Site, the cable route crosses the River Kennett.

Grid Connection Route B

- 9.4.18 As the cable route corridor for Grid Connection Route B passes westwards to the Burwell National Grid Substation Extension, it passes into the Soham Lode, New River and Burwell Lode river catchments. The cable route corridor for Grid Connection Route B then crosses the River Snail, which flows in a north-west direction from Snailwell and is a Main River and watercourse that forms part of the Soham Lode WFD water body (reference GB105033042860).
- 9.4.19 The Catch Water Drain and numerous unnamed small drains are connected with the Main Rivers and WFD waterbodies New River (GB105033042780) and Burwell Lode (GB105033042720), in the western extent of the study area, north of Burwell. These two watercourses flow in a north-west direction to the River Cam. This area is considered within the Swaffham Internal Drainage Board⁷, as part of the 'South Level Fens'. The District comprises mainly of high grade agricultural land much of which is below mean sea level and considerably below 'flood level' and is therefore totally reliant on pumped drainage for its existence as it has been for many years. The drains' water levels are terraced / controlled from the upper reaches, at a number of structures in the Board's drains to the Upware Pumping Station where surplus land drainage water is discharged to the River Cam.

⁷ <http://www.elydrainageboards.co.uk/internal-drainage-boards/swaffham/>

Water Quality

Sunnica East Site

- 9.4.20 The River Kennett – Lee Brook (GB105033043020, downstream Freckenham) is currently at Poor Ecological Potential with a target of Good Ecological Potential by 2027. Macrophytes and phytobenthos (combined), fish and hydrological regime are all failing to be at good status. Causes are thought to include physical modification for land drainage and barriers for fish, the presence of Invasive Non-Native Species (INNS) (North American signal crayfish *Pacifastacus leniusculus*), and groundwater and surface water abstraction (agriculture and water industry).
- 9.4.21 The River Kennett – Lee Brook (GB105033042990, upstream of Freckenham) is currently at Moderate Ecological Potential because of phosphate, macrophytes and phytobenthos (combined), and a degraded hydrological regime. The reasons for not achieving good status are diffuse and point pollution from sewage water treatment and agriculture (phosphate), groundwater abstractions from the water industry, and barriers for fish movement. The Environment Agency has set a less strict objective for this water body of Bad Overall Potential by 2015.
- 9.4.22 The River Lark (downstream of Mill Street Bridge, water body reference GB105033043052) is currently at Moderate Ecological Potential, its target status. This water body is failing to meet good status due to high phosphate levels due to sewage discharges from the water industry affecting phosphate. Physical modifications have occurred in connection to urban and transport and local and central government development.

Sunnica West Site

- 9.4.23 Lee Brook is an approximately 4km long WFD waterbody that is currently at Moderate Ecological Potential, its target status. Reasons for not being at Good Ecological Potential include a degraded hydrological regime and phosphate that are connected with reduced flows from surface water abstraction for agriculture, local and central government and water industry, and sewage discharges from water industry.

Cable Route Corridor

Grid Connection Route A

- 9.4.24 The cable route corridor for Grid Connection Route A passes between the Sunnica West Site and Sunnica East Site. This route crosses the River Kennett WFD waterbody (GB105033042990). The WFD waterbody classification was described in Paragraph 9.4.23.

Grid Connection Route B

- 9.4.25 As the cable route corridor for Grid Connection Route B passes westwards to the Burwell National Grid Substation Extension, it passes into the Soham Lode, New River and Burwell Lode river catchments. Water quality and WFD classifications for these water bodies is described in this section.
- 9.4.26 The Soham Lode WFD waterbody (GB105033042860) is at Moderate Ecological Potential, its target status. The reason for not being at a higher status is elevated phosphates, likely due to sewage discharge from the water industry. Physical modifications are due to local and central government, recreation and agriculture (mitigation implementation).
- 9.4.27 The New River (GB105033042780) waterbody is at Moderate Ecological Potential, with a target of Good Ecological Potential by 2027. The main reasons for not meeting its target are a degraded hydrological regime. Physical modification is due to reasons connected to agriculture, local and central government and recreation.
- 9.4.28 The Burwell Lode (GB105033042720) is currently at Moderate Ecological Potential, exceeding its target status of Poor Ecological Potential by 2015. The reasons for not being at a higher status are due to failing to meet good chemical status. This is due to the Priority Hazardous Substances Mercury and Its Compounds with the sources thought to be transport drainage and atmospheric deposition. Physical modification is due to reasons connected to agriculture, local and central government and recreation.

Aquatic Ecology and Nature Conservation Sites

There are several SSSIs, SACs, NNRs, LNRs and Ramsar sites in the study area that are believed to be water dependent and thus relevant to this assessment:

- Chippenham Fen and Snailwell Poor's Fen SSSI (in favourable status), Fenland SAC and Chippenham Fen NNR and Ramsar Site, is directly adjacent to the north of the Sunnica West Site;
- Brackland Rough SSSI is a damp valley woodland located approximately 200m north of the cable route for Grid Connection Route B, and over 350m north of the Sunnica West Site;
- Cherry Hill and The Gallops, Barton Mills SSSI (currently in unfavourable declining condition), and Barton Mills LNR, approximately 1km east of the Sunnica East Site;
- Red Lodge Heath SSSI (currently in unfavourable recovering condition), approximately 600m south-east of the Sunnica East Site; and
- Snailwell Meadows SSSI, connected to River Snail (in unfavourable recovering condition), approximately 50m south of the Sunnica West Site and 500m south of the cable route corridor for Grid Connection Route B.

9.4.29 The importance of water bodies will be determined taking account of any relevant ecological nature conservation designation, but also aquatic protected species that may be present. Current information on the potential for aquatic protected species to be present is described in **Chapter 8: Ecology**, of this Scoping Report.

9.5 Potential Effects and Mitigation

Construction and Decommissioning

9.5.1 A number of activities during construction and decommissioning phases are likely to generate impacts, which have the potential to affect the water environment, if unmitigated.

9.5.2 The greatest risks of adverse impacts during construction and decommissioning are in the vicinity of River Kennett, Lee Brook, River Snail, New River, Catch Water Drain and several small ponds present in the study area, which may be directly affected by the Scheme.

9.5.3 During construction the following adverse impacts may occur:

- Pollution of surface water due to deposition or spillage of soils, sediment, oils, fuels, or other construction chemicals, or through uncontrolled site run-off;
- Temporary changes in flood risk from changes in surface water runoff, e.g. disruption of stream flows during any potential culvert construction works, and exacerbation of localised flooding, due to deposition of silt, sediment in drains, ditches; and
- Potential impacts on local water supplies. The potential presence of any known Private Water Supplies (PWS) will be investigated during the impact assessment by requesting records from the environmental health departments for East Cambridgeshire and Forest Heath District Councils.

9.5.4 The Scheme includes the construction of a cable route to join the Sunnica East Site and Sunnica West Site to the Burwell National Grid Substation. This will necessitate the crossing of watercourses and drainage ditches in the area. The construction of cable routes crossing watercourses has the potential to result in modifications to WFD waterbodies. However, at this stage it is assumed that crossings of Internal Drainage Board watercourses and WFD waterbodies (reportable reaches) and their significant tributaries would be installed using non-intrusive trenchless techniques (e.g. HDD) at a suitable depth beneath the bed level. Crossings of other drainage features would be risk assessed on a case by case basis. Therefore, at this stage it is considered that there will not be any hydromorphological impacts during construction. This will be reviewed as further design information becomes available.

Operation

9.5.5 During the operational phase, the following adverse impacts may occur:

- Impacts on water quality in watercourses from run-off and spillages from new permanent hardstanding and maintenance activities, assuming surface water run-off does ultimately drain to a surface watercourse rather than simply to ground;
- Potential impacts on hydrology as a result of the Scheme. This may also have a subsequent effect on aquatic habitats and water-dependant nature conservation sites; and
- Potential impacts on local water supplies.

9.6 Assessment Methodology

Water Environment

Water Quality Assessment

9.6.1 Relevant data has been requested and obtained from the Environment Agency, although it is possible that further data will be requested as the impact assessment is undertaken. A Site Walkover Survey has also been undertaken during the Scoping Stage by a surface water specialist. This was to observe surface waterbodies in the study area and to make observations about their current condition and character, the presence of existing risks and any potential pathways for construction, operation and decommissioning impacts as a result of the Scheme. Further site surveys may be required as the Scheme develops.

9.6.2 A qualitative assessment of potential effects on surface water quality from construction, operation and decommissioning of the Scheme will be undertaken. This will consider the risk to surface water bodies resulting from construction or decommissioning works or future operation activity using a source-pathway-receptor approach. Where there is a risk of pollution, mitigation measures will be described with reference to best practice guidance (e.g. Guidance on Pollution Prevention Notes and Construction Industry Research and Information Association guidance).

Water Framework Directive Assessment

9.6.3 Due to the potential impacts upon WFD designated water bodies, a Preliminary WFD Assessment will be undertaken. The aim of this assessment would be to determine the potential for any non-compliance of the Scheme with WFD objectives for affected water bodies, using readily available information and site observations. This will include an examination of the potential construction, operation and decommissioning phase effects of the Scheme on relevant WFD hydromorphological, biological and physio-chemical parameters. Depending on the outcomes of the preliminary assessment, more detailed investigations may be required, which will be determined in consultation with the Environment Agency.

Surface Water Drainage Strategy

9.6.4 The design of drainage systems aims to ensure that there will be no significant increases in flood risk downstream, during storms up to and including the 1 in 100 (1%) annual probability design flood, with an allowance for climate change.

9.6.5 A Surface Water Drainage Strategy will be undertaken to ensure the risk of groundwater flooding is not increased as a result of the Scheme, and any increased land take for foundations and access roads (i.e. increase in impermeable area) across the Sunnica East Site and Sunnica West Site.

9.6.6 Careful consideration of the SuDS features, in-keeping with local planning policy and through liaison with the lead Local Flood Authority (LLFA), Internal Drainage Boards and Environment Agency, will be undertaken to ensure that the Surface Water Drainage Strategy adequately attenuates and treats runoff from the Scheme, whilst minimising flood risk to the Sunnica East Site and Sunnica West Site, and surrounding areas.

- 9.6.7 In accordance with planning policy and general good practice, mitigation will be provided by restricting surface water discharge rates and providing on-site attenuation.

Flood Risk Assessment

- 9.6.8 A Flood Risk Assessment (FRA) will be prepared for the Scheme, to review the current and future flood risk to the Sunnica East Site and Sunnica West Site from all sources (including surface water, groundwater and fluvial sources), in-keeping with the NPPF guidance, to inform the Scheme design and set out any proposed mitigation requirements that are to be addressed within the Surface Water Drainage Strategy.
- 9.6.9 Whilst the NPPF does not explicitly categorise solar farms under a particular vulnerability classification, it is proposed that the Scheme is considered as 'essential infrastructure', given its similarity to other uses placed under that designation, specifically, utility infrastructure including power stations, substations and wind turbines. This classification is acceptable within Flood Zone 1 and should not require an Exception Test. Cable routes are not generally considered in flood risk terms, other than temporary works during installation. However, the approach to the Sequential and Exception Tests for the cable route will be clarified with the Environment Agency and the LLFA as required.
- 9.6.10 Where development is to take place within areas at risk of flooding, there may be a requirement for the construction of flood compensation or mitigation measures to ensure no detrimental effect to flooding potential within or from the affected watercourse in the catchment once the Scheme is operational. The conclusions of this will be referred to within the flood risk, drainage and surface water assessment presented in the ES. The FRA will be a technical appendix to the ES.

Assessment of Effect Significance

- 9.6.11 The impact assessment will be based on a source-pathway-receptor model. For an impact on the water environment to exist the following is required:
- An impact source (such as the release of polluting chemicals, particulate matter, or biological materials that cause harm or discomfort to humans or other living organisms, or the loss or damage to all or part of a water body);
 - A receptor that is sensitive to that impact (i.e. water bodies and the services they support); and
 - A pathway by which the two are linked.
- 9.6.12 Once an impact has been identified and assessed, the effect category will be determined with reference to the criteria set out within the Design Manual for Roads and Bridges HD45/09 (Ref. 98). This can be applied to all development types and represents the most robust and nationally accepted criteria for the determination of potential effects on the water environment. The criteria will be adapted where required to take account of hydromorphological impacts and the full range of flood risks. Impacts and effects will be categorised as adverse / beneficial, direct / indirect, temporary / permanent and short term or long term, as per the methodology described in **Chapter 5: EIA Methodology**, of this Scoping Report. After embedded mitigation measures, and additional mitigation measures are taken into account, residual effects are those effects which are still predicted to potentially take place. Effects that are moderate or greater will be considered significant.

9.7 Assumptions, Limitations and Uncertainties

- 9.7.1 The assessment of potential effects is currently based on the description of the Scheme set out in **Chapter 2: The Scheme**, of this Scoping Report. The final routes for Grid Connection Route A and Grid Connection Route B (within the cable route corridors shown on Figure 1-2), and the cable route construction methodologies and mitigation, have not yet been determined. This is of particular importance when considering impacts associated with the watercourse crossings for Grid Connection Routes A and B, the quality of surface water runoff, impacts to hydromorphology and channel hydraulics.

- 9.7.2 Receptors considered in this assessment include the Scheme itself, other existing infrastructure assets, residential buildings, commercial buildings and agricultural land, and property potentially affected by the Scheme.
- 9.7.3 Requirements for hydraulic modelling of watercourses will be discussed with the Environment Agency / LLFA; any modelling required will be undertaken as part of the ES to inform the FRA and Surface Water Drainage Strategy.
- 9.7.4 Visual surveys will be undertaken of accessible water/drainage features to inform the Surface Water Drainage Strategy. However, it may not be possible to survey all significant locations / structures due to access constraints.
- 9.7.5 Other than the site walkover survey, the FRA and Drainage Strategy will be based on desktop surveys and best available site layout proposals. Where available, topographical data will be used to support the FRA. In the absence of topographical data, LiDAR data will be used to inform the FRA and the Surface Water Drainage Strategy.
- 9.7.6 Temporary works will not be assessed unless they are of a potentially significant scale and have the potential to adversely affect flood risk or impact the quality or form of water bodies. The temporary works where such risks are considered significant (for example, excavations for the cable routes), will be identified and assessed within the FRA, Preliminary WFD Assessment and impact assessment.

10. Landscape and Visual Amenity

10.1 Introduction

- 10.1.1 This chapter considers the two related sub-topics of landscape and visual amenity. The objectives of the chapter are to identify sensitive landscape and visual receptors in the vicinity of the Scheme that will need to be scoped into the landscape and visual impact assessment (LVIA). The chapter also outlines the potential landscape and visual impacts and key mitigation principles that could be incorporated and sets out the proposed approach that will be taken within the LVIA.
- 10.1.2 This chapter should be read in conjunction with **Chapter 7: Cultural Heritage**, of this Scoping Report, which details matters relating to cultural heritage assets including the Chippenham Hall Grade II RPG. This designation is referenced in this chapter as there are potential overlaps between the LVIA and cultural heritage assessment in relation to the wider landscape setting of the RPG.

10.2 Study Area

- 10.2.1 The LVIA study area has been informed by an initial desk-based review of the landform, and landcover context surrounding the Scheme, supported by preliminary computer generated Zones of Theoretical Visibility (ZTV) in Figures 10-1 and 10-2. These have then been verified during a site visit.
- 10.2.2 The preliminary ZTVs indicate areas of potential visibility of the proposed solar PV panels and, therefore help to identify the scope of receptors likely to be affected, and assist in identifying important viewpoints to form the basis of the assessment. They are based on a maximum height of panels of 3.5m across the Sunnica East Site and Sunnica West Site. They are also based on indicative locations and heights for proposed on-site substations at the Sunnica East Site and Sunnica West Site. As set out in **Chapter 2: The Scheme** of this Scoping Report, these could extend up to 10m in height and represent the tallest element of the Scheme. The preliminary ZTVs do not include other associated infrastructure that may be necessary, the scale and location of which is unknown at the time of writing this Scoping Report. However, it is not anticipated that the other associated infrastructure will be more substantial in scale than the on-site substations.
- 10.2.3 A review of the preliminary ZTVs indicates that the principal zones of visibility of the Sunnica East Site and Sunnica West Site will be concentrated within 5km over bare ground (Figure 10-1). However, when considered with the addition of existing features including woodland and buildings surrounding the Sunnica East Site and Sunnica West Site, the principal zones of visibility will be generally confined to locations within 2km (Figure 10-2).
- 10.2.4 Further analysis indicated that visibility would be limited from locations beyond 2km and as such landscape and visual effects beyond this distance are not likely to be significant and receptors beyond 2km are not considered further.
- 10.2.5 As the design of the Scheme evolves, the study area to be used for the LVIA may need to be refined to ensure all works, including temporary areas required for construction and permanent infrastructure are included. The maximum parameters of these, in terms of height and location, will be determined as the Scheme design develops, taking into account environmental and technical factors. A reasonable worst case will be assessed and presented in the ES.

10.3 Planning Policy Context and Guidance

10.3.1 The following planning policies have been taken into account in developing the assessment methodology and identifying and selecting receptors sensitivity, potential significant environmental effects; and mitigation:

National Planning Policy

- NPS EN-1 (Ref. 5) – paragraphs 4.1.3-4.1.4, 4.2.1, 4.2.34.2.4, 4.2.8-4.2.10 in relation to assessment principles and paragraphs 4.5.1-4.5.3 in relation to good design, 5.1.2 in relation to ES requirements and section 5.9 in relation to landscape and visual assessment.
- NPS EN-2 (Ref. 6) – paragraphs 2.1.2 in relation to good design for landscape and visual amenity.
- NPS EN-5 (Ref. 7) - paragraphs 2.2.5 in relation to location and landscape considerations and section 2.8 (paragraph 2.8.4) in relation to landscape and visual assessment.
- NPPF (Ref. 8) – in particular, paragraphs 127 in relation to achieving well designed places, paragraph 153 in relation to compliance with development plan policies, paragraph 170 in relation to conservation and enhancing the natural environment and 180 in relation to siting development that is appropriate for its location taking account of effects and mitigation.

National Guidance

- Planning Practice Guidance, Natural Environment (Landscape) (Ref. 60); and
- Planning Practice Guidance, Renewable and Low Carbon Energy (Ref. 99), with particular reference to glint and glare.

Local Planning Policy

- East Cambridgeshire District Council Local Plan Adopted April 2015 (Ref. 9), with particular reference to Policy ENV1: Landscape and settlement character, ENV2: Design, ENV6: Renewable Energy Development, ENV11: Conservation Areas, ENV15: Historic Parks and Gardens and COM 5: Strategic Green Infrastructure;
- East Cambridgeshire District Council SPD Renewable Energy Development (Commercial Scale) October 2014 (Ref. 11), with particular reference to Section 3: Visual landscape impact and key views;
- Forest Heath Core Strategy (2010) (Ref. 12), with particular reference to Spatial Objectives ENV3 and ENV4; Policy CS2: Natural Environment; Policy CS3: Landscape Character and the Historic Environment; and CS5: Design Quality;
- Forest Heath and St. Edmundsbury Local Plan: Joint Development Management Policies Document (last updated February 2015) (Ref. 13), with particular reference to Policy DM2: Creating Places - Development Principles and Local Distinctiveness; DM5: Development in the Countryside; DM8: Low and Zero Carbon Energy Generation; DM13: Landscape Features, DM15: Listed Buildings, DM19: Development Affecting Parks and Gardens of Special Historic, DM31: Farm Diversification; and
- Cambridgeshire Green Infrastructure Strategy, with particular reference to Section 4.6, Strategic Area 5 (Chippenham Fen) (Ref. 100).

10.3.2 These policies identify the requirement for good design and the need for mitigation to assist in integrating development into its landscape context. They also require the assessment of effects to consider local strategies, policies and character assessment.

10.4 Baseline Conditions

- 10.4.1 This section provides a review of the key local guidance documents and identifies those landscape and visual receptors which merit detailed consideration in the LVIA. In accordance with the Guidelines for Landscape and Visual Impact Assessment, Third Edition (GLVIA3) (Ref. 101), it also identifies those which are 'scoped out' from further assessment as effects "*have been judged unlikely to occur or so insignificant that it is not essential to consider them further*".

Landscape Context

- 10.4.2 The Scheme straddles the county boundaries of Cambridgeshire (district of East Cambridgeshire) and Suffolk (district of Forest Heath). As described in Paragraph 1.1.1, the Scheme Boundary encompasses the Sunnica East Site and Sunnica West Site and associated infrastructure for connection to the national grid (Grid Connection Route A, between the Sunnica East Site and the Sunnica West Site, and Grid Connection Route B, between the Sunnica West Site and the Burwell National Grid Substation Extension).

Sunnica East Site

- 10.4.3 The Sunnica East Site is located on arable farmland between the settlements of Worlington, Freckenham and Red Lodge, extending towards West Row and Isleham Road to the north. It comprises arable fields of varied size, with small to irregular shape to the south of Freckenham and Worlington and more moderate to large regular fields to the north of Freckenham towards West Row. The landscape features of the Sunnica East Site consist of individual trees, hedgerows, tree belts (linear) and small deciduous and plantation woodland blocks. The hedgerows range between lengths of dense tall vegetation (shrub and tree species), and thin lines of vegetation with sporadic trees present, although the prior is a dominant feature. The Sunnica East Site is traversed by several minor roads connecting villages, including the B1102 between Freckenham and Worlington, Elms Road and Newmarket Road to the south and Beck Road to the north. The Sunnica East Site is further traversed by farm access tracks and ProW.
- 10.4.4 The topography across the northern and western sections is relatively flat, lying between 10-15m AOD, but to the east the land rises to local high points of 35m AOD at Chalk Hill. Notable man-made features also exist to the south of Worlington with an operational quarry and reservoir within the Sunnica East Site and an operational solar farm located between the southern site boundary and the A11.
- 10.4.5 The landscape surrounding the Sunnica East Site is similar in context to the north of the A11 trunk road. The Sunnica East Site also lies close to several rural villages (Worlington, Freckenham and Isleham) to the north, (Barton Mills) east and (Red Lodge) south. Farmsteads are also present including Bay Farm, which is immediately south. ProWs cross the Sunnica East Site to the south of Worlington and Freckenham and run along the Site boundaries to the south and west.

Sunnica West Site

- 10.4.6 The Sunnica West Site consists of two land parcels of agricultural land between the A14/A11 trunk roads to the south, Chippenham Hall RPG to the east, Chippenham Fen to the northeast and the settlement of Snailwell to the west. The landscape features within the Sunnica West Site consist of individual trees, managed hedgerows, tree shelter belts (linear), small woodland and copses, agricultural fields, and farm access tracks. There is an avenue of trees which bisects the southern sections of the Sunnica West Site from Chippenham Hall Park to the A14, which contains a track at its centre. The arable fields are regular in pattern and moderate to large in scale.
- 10.4.7 The topography across the larger southern sections of the Sunnica West Site is undulating between 20m and 25m AOD but rises to 35m AOD to the north-west. The topography across the smaller area to the north is lower and flatter, lying between 15m and 20m AOD. The majority of the landscape surrounding the Sunnica West Site is similar in context and comprises regular shaped arable fields interspersed with managed hedgerows, tall shelter belts of trees and in the Chippenham Hall RPG area, a parkland landscape with mature

individual trees. The exception to this is Chippenham Fen, a designated nature conservation site (see **Chapter 8: Ecology**, of this Scoping Report), which lies immediately north of the western land parcel Sunnica West Site. The landscape within the fen provides a change in landscape context with a diverse range of habitats associated with wetlands, meadows and wet woodland. Much of the remaining area surrounding the Sunnica West Site is related to the Newmarket horse breeding and racing industry. It is characterised by grazed paddocks, horse gallops and exercise tracks, and the British Racing School is located to the south of the Sunnica West Site, beyond the A14. To the south, the land continues to rise up to local high points of 55m AOD along across the Limekilns gallops and the B1506. A PRow runs along the western boundary of the Sunnica West Site.

Cable Route Corridor and Burwell National Grid Substation Extension

Grid Connection Route A

- 10.4.8 The landscape within and surrounding the cable route corridor is similar to the Sunnica East Site and Sunnica West Site, with moderate sized arable fields and individual trees, hedgerows, tree belts (linear) and small deciduous and plantation woodland blocks present.

Grid Connection Route B

- 10.4.9 The landscape within and surrounding the cable route corridor for Grid Connection B, including the Burwell National Grid Substation Extension, comprises more open, flat arable farmland with individual trees, hedgerows, tree belts (linear) and small deciduous and plantation woodland blocks are present. The cable route corridor crosses more built up and industrial areas to the south of Fordham and north-west of Burwell.

National Landscape Character

- 10.4.10 The study area crosses two National Character Areas (NCA), as defined by Natural England (Ref. 102 and Ref. 103). To the northeast, the Sunnica East Site lies on the south western boundary of NCA 85: The Brecks, where it joins NCA87. This NCA, *“has an ages-old identity, a very particular land use history and a richly distinctive wildlife, which sets it apart from all surrounding landscapes. It is a “largely open, gently undulating landscape with a low-lying, dry plateau that rises to the north. Subtle long slopes lead to alluvial flats containing shallow, meandering wooded river valleys”*. This area is sandwiched between the more fertile, and more wooded, clayland plateau to the north, east and south, and the level drained peat and silt fens to the west, which the main rivers, the Little Ouse, Wissey and Lark, drain into.
- 10.4.11 The Sunnica West Site, Grid Connection Route A, Grid Connection Route B and Burwell National Grid Substation Extension lie wholly within the north eastern sections of NCA 87: East Anglian Chalk. This area is defined by the narrow continuation of the chalk ridge that runs south-west–north-east across southern England. The NCA profile notes in its summary that *“This creates a visually simple and uninterrupted landscape of smooth, rolling chalkland hills with large regular fields enclosed by low hawthorn hedges, with few trees, straight roads and expansive views to the north”*.
- 10.4.12 In the context of the area north of Newmarket, the NCA goes on to note that *“A significant influence around Newmarket has historically been horse-racing and stud farms, which have brought a manicured appearance to the landscape”*
- 10.4.13 The NCA also notes that *“The chalklands are traversed by several ancient trackways, including the major ancient trackway, the Icknield Way”*.
- 10.4.14 Beyond these two host NCAs, a further NCA lies approximately 1km to the north of the Sunnica East Site and Sunnica West Site and covers the westernmost extent of Grid Connection Route B and the proposed National Grid Substation Extension. This NCA is defined as NCA 46: The Fens (Ref. 104). It is a human influenced wetland landscape, noted for its *“large-scale, flat, open landscape with extensive vistas to level horizons”*.

Regional Landscape Character

10.4.15 At a regional level, the East of England Landscape Framework (Ref. 105) provides context for defining landscape character. It classifies the regional landscape into landscape typologies. Of relevance to the Scheme, two key typologies are present: Lowland Village Chalklands and Forested Estate Sandlands. These typologies inform more detailed character assessments at the local level.

Local Landscape Character

10.4.16 At a local level, the landscape character across most of the study area is described within the Suffolk Landscape Character Assessment (Ref. 106) and within that, two landscape character areas (LCAs) are present. The majority of the central sections of the Sunnica East Site lie within the Estate Sandlands LCA, but the Sunnica East Site also straddles the boundary with the Rolling Estate Chalklands LCA on the eastern, western and northern fringes of the Sunnica East Site. The Sunnica West Site, Grid Connection Routes A and B and the Burwell National Grid Substation Extension lie within one area of the Rolling Estate Chalklands LCA.

10.4.17 The key characteristics of the Estate Sandlands LCA relevant to the study area comprise:

- Flat or very gently rolling plateaux of free-draining sandy soils, overlying drift deposits of either glacial or fluvial origin;
- Chalky in parts of the Brecks, but uniformly acid and sandy in the south-east;
- Absence of watercourses;
- Extensive areas of heathland or acid grassland;
- Strongly geometric structure of fields enclosed in the 18th and 19th century;
- Large continuous blocks of commercial forestry;
- Characteristic 'pine lines' especially, but not solely, in the Brecks;
- Widespread planting of tree belts and rectilinear plantations;
- Generally a landscape without ancient woodland, but there are some isolated and very significant exceptions;
- High incidence of relatively late, estate type, brick buildings; and
- North-west slate roofs.

10.4.18 The key characteristics of the Rolling Estate Chalklands relevant to the study area comprise:

- Very gently rolling or flat landscape of chalky free draining loam;
- Dominated by large scale arable production;
- "Studscape" of small paddocks and shelterbelts;
- Large uniform fields enclosed by low hawthorn hedges;
- Shelter belt planting, often ornamental species;
- A "well kept" and tidy landscape;
- Open views;
- Clustered villages with flint and thatch vernacular houses; and
- Many new large "prestige" homes in villages.

10.4.19 The local landscape character across the Sunnica West Site was also assessed by Cambridgeshire County Council in the 1990s in their “*Cambridgeshire Landscape Guidelines – A Manual for Management and Change In The Rural Landscape*” (Ref. 107). The Sunnica West Site lies within Area 2: Chalklands, of which the key characteristics are identified as:

- Complex settlement patterns;
- Large fields;
- Modern roads;
- Interlinked developments;
- Smooth rolling chalk land hills;
- Wooded escarpments and beech hangars; and
- Strong hedgerow and woodland structure.

10.4.20 Overall, the landscape character of the study area is distinguished by three distinctive and contrasting features:

- Fens – these cover the north western sections of the study area and are characterised by large open, flat and low lying fields under wide skies, crossed by numerous waterways and drainage channels. There are fine, long distance views of buildings and settlements, and most settlements are located on old ‘islands’ within what were originally wet fens.
- Chalk hills – these extend between Cambridge and Newmarket, and are a broad scale landscape of large fields, low hedges and relatively few trees. Villages are mainly nucleated in form.
- Clay hills – these lie to the south-east of the study area, and are an undulating landscape of gently rolling hills and scattered woodland. A number of small hamlets and villages have developed in sheltered locations, often originally built to take advantage of the natural springs.

Landscape Planning Designations

10.4.21 There are no designated landscapes within the Scheme Boundary. However, there are some features of heritage value in proximity, including conservation areas, listed buildings and Scheduled Monuments. Chippenham Hall is a Grade II RPG, the majority of which lies to the north of the Sunnica West Site, enclosed by a continuous wall. To the south side of the walled area, a spur or ‘ride’ runs through the centre of the Sunnica West Site before it crosses over the A14 on a bridge and which, is still of historic importance. These features are considered further in **Chapter 7: Cultural Heritage** and **Chapter 8: Ecology**, of this Scoping Report.

Other Planning Considerations

10.4.22 The Sunnica West Site lies within a Strategic Area for Green Infrastructure at Chippenham Fen, as defined in the Cambridgeshire Green Infrastructure Strategy (Ref. 100). This is to “*promote the historic fen landscape and to improve public access*”.

Extent of Visibility

10.4.23 The extent of visibility of the Scheme is informed by the ZTVs (Figure 10-1 and 10-2), and then principally from a number of viewpoints that represent a broad range of sensitive receptors.

10.4.24 As the bare ground and screened ZTVs show, there is some potential for views of the Scheme from the surrounding landscape. This will include principal zones of visibility around the Sunnica East Site extending to 2km to the north, west and east but limited to the south-east. At the Sunnica West Site, the extent of visibility is reduced slightly. It will extend across principal zones up to 2km to the south but it will then be restricted to closer points to the east, west and north. The extent of visibility will be reduced further due to additional vegetation patterns.

Key Visual Receptors

10.4.25 A range of visual receptors and receptor groups can be expected to be affected by the Scheme, including:

- Residents of settlements;
- Residents within properties scattered throughout the open countryside and possibly residents of hotels and holiday/caravan parks;
- Users of nearby PRoW that are scattered throughout the landscape and run along the boundaries of the Sunnica East Site and Sunnica West Site, and traverse across the Sunnica East Site;
- People travelling through the landscape by car, bicycle, bus or train including several minor roads that run through the Sunnica East Site;
- In addition, there might be views of the Scheme from public open spaces such as surrounding golf courses or nature reserves including Chippenham Fen NNR; and
- People may also experience views from workplaces, educational establishments and from vehicles travelling on trunk roads including the A14, A11, and surrounding roads where they cross or run within close proximity to the Sunnica East Site and Sunnica West Site and Grid Connection Routes A and B (including the Burwell National Grid Substation Extension).

Public Rights of Way

10.4.26 PRoW cross the Sunnica East Site from the south side of Worlington down to Elms Road and to the south-east side of Freckenham. PRoW also run along boundaries of the Sunnica East Site to the south at Badlingham Manor and at two further points to the north side of Freckenham, along Lee Brook and North Street. There is also a PRoW just north of the Sunnica East Site running along the low lying River Lark on the south side of West Row.

10.4.27 As Figure 2-1 illustrates, there are no PRoW within the Sunnica West Site, but a PRoW runs immediately adjacent to the western boundary of the Sunnica West Site (south). It runs from Snailwell in the northwest towards Newmarket in the south, via a bridge crossing over the A14. Due to the thick tree coverage along the majority of this footpath, most views eastwards towards the Sunnica West Site are anticipated to be well screened in summer months.

10.4.28 A further PRoW public footpath leads east from the north of Snailwell, to the south of the Sunnica West Site (north). This PRoW links up with the Chippenham Fen landscape and Chippenham Park, at a lower lying point in the landscape with most views to the south reduced to local views contained by rising land and vegetation.

10.4.29 PRoW also cross the cable route corridors for Grid Connection Routes A and B in a number of locations.

Settlements

10.4.30 People within the villages of Worlington, Barton Mills, Red Lodge, Freckenham, West Row and Isleham will potentially have a range of potential views of the Sunnica East Site from the nearest settlement edges but within the settlements views will be screened by buildings and vegetation.

10.4.31 As Figure 2-1b illustrates, the closest settlement to the Sunnica West Site is Snailwell, which lies approximately 0.75km to the west, and is separated from the Sunnica West Site by Newmarket Road and Chippenham Road. Properties are clustered around the village centre at a lower elevation than the nearest sections of the Sunnica West Site (south), but at a similar elevation to the Sunnica West Site (north). The focus of views from this settlement are to the north. Views to the Sunnica West Site (north) are therefore possible but view to the Sunnica West Site (south) are limited.

10.4.32 Newmarket is located approximately 3.5km to the south of the Sunnica West Site (south), beyond the A14. However, given the intervening landform and landcover, views from the settlement itself are limited.

10.4.33 There are views of the cable route corridor for Grid Connection Route A, there are potential views from the fringes of Chippenham and Red Lodge, and for Grid Connection Route B from the fringes of the settlements of Snailwell, Fordham and Burwell, and the Burwell National Grid Substation Extension from the fringes of Burwell.

Highways

10.4.34 The A14 lies immediately to the south of the Sunnica West Site (south) and forms a significant part of the southern boundary. The A11 links with the A14 at the eastern extent of the Sunnica West Site (south) and forms the remainder of the boundary. From both of these roads there are clear views into the Sunnica West Site (south) where the roadside vegetation is limited and sparse, and the road does not sit in cutting until further points to the east and west. There is also potential for views of the Sunnica West Site (north) to the north of Snailwell from an isolated point on the A142 to the south of Fordham.

10.4.35 The Sunnica East Site is set back from trunk roads across the western sections. However, views are gained to the more elevated sections of the Sunnica East Site across Chalk Hill from the A11 to the north of Red Lodge.

Important Viewpoints and Representative Viewpoints

10.4.36 There are no specific viewpoints identified on OS mapping within the immediate study area.

10.4.37 Key views are noted within the East Cambridgeshire District Council SPG for Renewable Energy Development (Ref. 11). They include a range of views towards Ely Cathedral. However, these viewpoints lie to the north of the study area and are focused further north.

10.4.38 The potential for important views has been appraised and 13 initial viewpoints are considered to cover a representative range of viewing distances, elevations and orientations, with different viewing experiences of the Scheme. They will be used as 'samples' on which to base judgements and will help establish how visible the proposals will be from specific locations and help to gauge the anticipated effects upon visual amenity. They will also be used to illustrate the effects of the Scheme in year 1 and in year 15 of operation with photomontages. The initial locations for these are shown on the ZTVs in Figures 10-1 and 10-2 with initial photographs provided in Appendix B. Together with other key views, they will assist in making judgements on effects on visual amenity. The viewpoints are noted as follows:

- Viewpoint 1 – B1506, The Limekilns;
- Viewpoint 2 – PRoW, Southeast of Snailwell;
- Viewpoint 3 – La Hogue Road, adjacent to Chippenham Hall RPG;
- Viewpoint 4 – Norwich Road, A11 junction at Waterhall Farm;
- Viewpoint 5 – PRoW, Elms Road, Freckenham;
- Viewpoint 6 – B1102, Freckenham Road, Worlington;
- Viewpoint 7 – PRoW, Mortimer Lane, Freckenham;
- Viewpoint 8 – Bay Farm, Newmarket Road;
- Viewpoint 9 – PRoW River Lark, West Row
- Viewpoint 10 – Golf Links Road, at Royal Worlington and Newmarket Golf Course;
- Viewpoint 11 – Snailwell Road, east of junction with A142;
- Viewpoint 12 – Chippenham Road, east of Snailwell; and
- Viewpoint 13 – PRoW, east side of Snailwell.

10.4.39 These locations will be reviewed as the Scheme design progresses. The final selection of viewpoints will be consulted upon and agreed with the Local Planning Authorities.

Potential Effects and Mitigation

10.4.40 The LVIA will assess the likely effects on landscape features and character within the study area. In particular, the Scheme has the potential to affect the following landscape and visual resources during construction, operation and decommissioning. The significance of impacts on these will be assessed through detailed assessment and reported in the ES. Aspects to which potential effects are likely to relate include:

- Physical features and elements of the landscape within the Sunnica East Site and Sunnica West Site (addition, alteration and / or removal of features) and the cable route corridors for Grid Connection Routes A and B and, Burwell National Grid Substation Extension;
- Landscape character of the Sunnica East Site and Sunnica West Site, and the cable route corridors for grid Connection Routes A and B, and Burwell National Grid Substation Extension and the surrounding area up to a radius of 2km; and
- The views and visual amenity of people in the surrounding area up to a radius of 2km from the Sunnica East Site and Sunnica West Site, cable route corridors for Grid Connection Routes A and B, and Burwell National Grid Substation Extension.

10.4.41 The effects on landscape and visual receptors will be mitigated as far as possible, to avoid, prevent, reduce or offset effects, through the integrated design and mitigation strategy for the Scheme. This will comprise primary and secondary measures. Primary measures are those developed through the iterative design process that will become integrated or embedded into the project design along with standard construction and operational management practices for avoiding and reducing environmental effects. Secondary measures are those *“designed to address any residual adverse effects remaining after primary measures and standard construction practices have been incorporated into the scheme”* (Ref. 101).

10.4.42 The primary mitigation measures integrated into the design of the Scheme will consider the following principles.

Sunnica East Site

- Offset the Scheme from the nearest settlement fringes to protect key views to/from settlements and the setting of the Freckenham Conservation Area;
- Provide a combination of internal site planting and development setbacks from boundaries adjacent to sections of roads between rural settlements, particularly where there the Scheme is located on both sides; and
- Consider the potential for enhancement of PRoW through the Sunnica East Site and potential link to/through the quarry restoration area.

Sunnica West Site

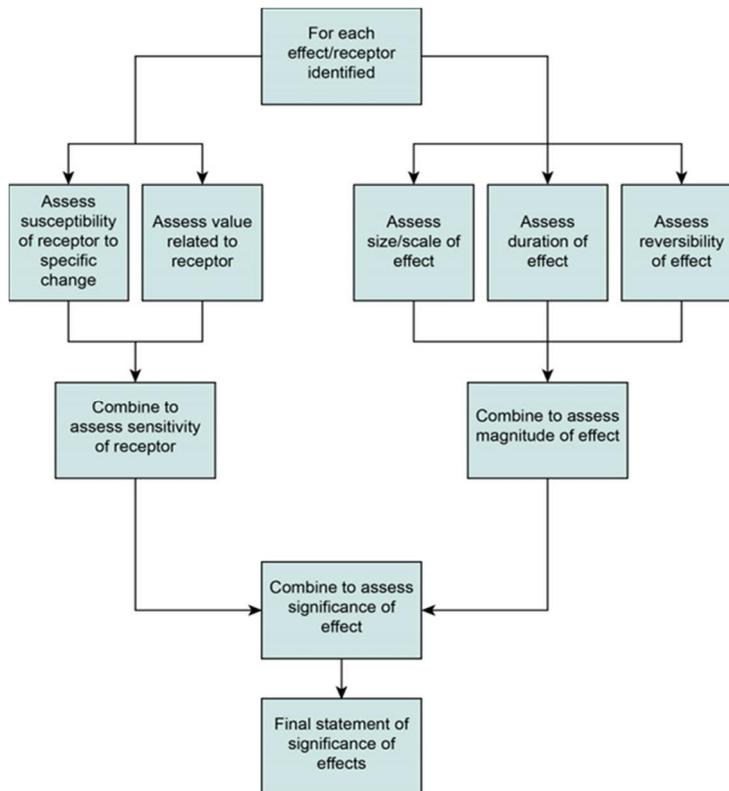
- Offset or set back the Scheme from the trunk roads and local roads to the south where a sequence of views could be experienced;
- Provide a combination of internal site planting and development setbacks from boundaries and elevated land to the northwest side of the southern sections of the Sunnica West Site, to help screen the Scheme in key views from more elevated land across the Newmarket Gallops to the south;
- Provide development setbacks from the north and eastern boundaries to protect views to the wider landscape setting of the RPG (i.e. surrounding points where it could be experienced from);
- Consider the potential for enhancement of field boundaries to provide greater connectivity in landcover patterns; and
- Provide a combination of internal Site planting and development setbacks to screen views of the separate northern section of the Sunnica West Site from Snailwell along with the PRoW to the south, Chippenham Fen and Chippenham Park to the east and the A142 to the north.

- 10.4.43 Some residual landscape and visual effects during operation may remain significant despite mitigation. For example there could be reversible long-term effects on the rural character of the landscape as a result of the Scheme. There may also be reversible long-term effects on views experienced by some sensitive receptors, where views are open and experienced frequently in a sequence of views and where the Scheme is in close proximity.
- 10.4.44 Climate change and biosecurity are also major factors likely to bring about future change in the landscape. The need for climate change mitigation and adaption is now well established at policy level. These issues for appropriate mitigation will be considered in line with the Landscape Institutes policy document 'Landscape architecture and the challenge of climate change', (Ref. 108). The planting design will take account of the risks of biosecurity issues, such as the increased prevalence of pests and diseases, through a wider mix of species including some non-natives.
- 10.4.45 Further consideration will be given to identify opportunities for landscape enhancement beyond mitigation proposals to appraise what proposals will deliver the greatest balance and benefit in terms of ecosystem services, landscape character and landscape setting of important features noted above.

10.5 Assessment Methodology

- 10.5.1 The methodology for the LVIA has been developed with reference to the following principal sources of guidance and information:
- Guidelines for Landscape and Visual Impact Assessment, Third Edition. (Landscape Institute and Institute of Environmental Management and Assessment, 2013) (hereafter referred to as GLVIA3) (Ref. 101);
 - Visual representation of development proposals (Landscape Institute, 2017) (Ref. 109); and
 - Landscape Institute Advice Note 01/11: Photography and photomontage in landscape and visual impact assessment (Ref. 110).
- 10.5.2 These publications together form a standard reference for undertaking LVIA for major renewable energy schemes in the UK. The guidance is not prescriptive and therefore a tailored approach has been developed, which recognises the importance of professional judgement.
- 10.5.3 The LVIA will be also be informed by aerial photography, maps and local publications.
- 10.5.4 GLVIA3 (Ref. 101) states that "*Landscape and Visual Impact Assessment is a tool used to identify and assess the significance of and the effects of change resulting from development on both the landscape as an environmental resource in its own right and people's views and visual amenity.*" (para 1.1).
- 10.5.5 In addition, sections 2.20-2.22 of GLVIA 3 (Ref. 101) indicate that the two components (assessment of landscape effects, and assessment of visual effects) are "*related but very different considerations*".
- 10.5.6 The LVIA methodology will follow the process set out in Figure 3.5 of GLVIA3 (Ref. 101), as shown below in Diagram 10-1.

Diagram 10-1: GLVIA3, Assessing the significance of effects



10.5.7 In accordance with the GLVIA3 process, the LVIA will include the following key stages.

- Baseline review;
- Sensitivity (nature of the receptor);
- Magnitude Impact (nature of effect); and
- Significance of Effects.

Landscape value and sensitivity

10.5.8 The nature of a receptor’s sensitivity can be assessed by combining judgements about its value and its susceptibility to change arising from the specific proposal (GLVIA3, page 38 (Ref. 101)). The assessment of the value of each of the LCAs, which form the basis of this assessment, will be informed by the information set out in the baseline, including any relevant landscape designations, and the value of elements or characteristics of notable aesthetic, perceptual or experiential quality.

10.5.9 Value will be assessed at the baseline stage and consideration will be given to the criteria set out in GLVIA3 Box 5.1 (page 84) (Ref. 101), and with reference to Table 10-1.

Table 10-1 Landscape Value Criteria

<i>Classification</i>	<i>Value of LCA</i>
National	Landscape with elements of national importance, e.g. protected by legislation
Regional	Landscape with elements of regional importance designated regional leisure routes and conservation areas.

<i>Classification</i>	<i>Value of LCA</i>
Local	Landscape with elements which are protected or valued through local or neighbourhood planning policies, such as protected open space or groups of listed buildings or buildings of townscape merit
Community	Landscape with relatively common elements which are likely to be valued by the community which lives and works in the area
Limited	Landscape with weak or discordant elements and characteristics which detract from the quality of the area.

Landscape Susceptibility

10.5.10 GLVIA3 paragraph 5.40 (Ref. 101) defines landscape susceptibility as:

“the ability of the landscape receptor (whether it be overall character or condition of a particular landscape type or area, or an individual element and/or features, or a particular aesthetic and perceptual aspect) to accommodate the proposed development without undue consequences for the maintenance of the baseline situation” (paragraph 5.40).

10.5.11 GLVIA3, paragraph 5.43 (Ref. 101) it states that judgements about susceptibility of landscape receptors to change should be recorded on a verbal scale and this will be applied as set out in Table 10-2.

Table 10-2 Susceptibility to Change of Landscape Receptors

<i>Classification</i>	<i>Susceptibility to Change</i>
High	Undue consequences are likely to arise from the Scheme
Medium	Undue consequences may arise from the Scheme
Low	Undue consequences are unlikely to arise from the Scheme

Landscape Sensitivity

10.5.12 The assessment of landscape value and landscape susceptibility will be combined and are considered together to define the sensitivity or nature of the receptor.

Table 10-3 Landscape Sensitivity

<i>Sensitivity</i>	<i>Description</i>
High	<p>Landscape of national or regional value with distinctive elements and characteristics, highly susceptible to small changes of the type of development proposed without undue consequences for the maintenance of the baseline situation. Typically these would be;</p> <ul style="list-style-type: none"> • Of high quality with distinctive elements and features making a positive contribution to character and sense of place. • Likely to be designated, but the aspects which underpin such value may also be present outside designated areas, especially at the local scale. • Areas of special recognised value through use, perception or historic and cultural associations. • Likely to contain features and elements that are rare and could not be replaced.

<i>Sensitivity</i>	<i>Description</i>
Medium	<p>Landscape of local or community value, with mostly common elements and characteristics, which by nature of their character would be able to partly accommodate change of the type proposed without undue consequences for the maintenance of the baseline situation. Typically these would be;</p> <ul style="list-style-type: none"> • Comprised of mostly commonplace elements and features creating generally unremarkable character but may include some rarer elements and with some sense of place. • Locally designated, or value may be expressed through non-statutory local publications. • Containing some features of value through use, perception or historic and cultural associations. • Likely to contain some features and elements that could not be replaced.
Low	<p>Landscape of community or limited value and relatively inconsequential elements and characteristics, the nature of which is potentially tolerant of substantial change of the type proposed. Typically these would be;</p> <ul style="list-style-type: none"> • Comprised of some features and elements that are discordant, derelict or in decline, resulting in indistinct character with little or no sense of place. • Not designated. • Containing few, if any, features of value through use, perception or historic and cultural associations. • Likely to contain few, if any, features and elements that could not be replaced.
Very Low	<p>Landscape of very low or limited value which is damaged, degraded or a substantially modified landscape pattern with few or no natural or original features remaining, such that it is tolerant of change.</p>

Visual receptor value and sensitivity

10.5.13 Visual effects result from changes in the composition of views and or changes to the overall visual amenity. GLVIA 3 (Ref. 101) notes that the visual sensitivity of receptors is dependent upon:

“the susceptibility to change in views and visual amenity and also the value attached to particular views” (paragraph 6.31).

10.5.14 Visual sensitivity includes a combination of parameters, such as the activity/occupation/pastime of the receptors at particular locations; the extent to which their attention or interest may be focused on the views and the visual amenity they experience. It will comprise the location, relative focus and orientation of particular views, the quality or importance of the existing view and its attractiveness / or scenic quality; the principal or secondary interest in that particular view; the static or sequential nature of views; the ability of the view to accommodate the type of development and the frequency and duration of the view.

Visual Value

10.5.15 GLVIA3 (Ref. 101) stresses the importance of considering the value attached to views, for example in relation to heritage assets, or through planning designations. It provides a list of indicators of the value of views in paragraph 6.37, including:

- Appearance in guidebooks or tourist maps;
- Provision of facilities, such as parking places, sign boards and interpretive materials; and
- References in literature or art.

10.5.16 The assessment of the value of views is also informed by the location of the viewing place and the quality or designation of the existing elements in the view, as shown in Table 10-4 below.

Table 10-4 Visual Value Criteria

<i>Classification</i>	<i>Value of View</i>
National	Recognised or iconic views within nationally/internationally designated landscapes, such as National Parks, Areas of Outstanding Natural Beauty (AONB) and/or national/international landmarks with views recognised in planning policy and/or management plans
Regional	Views or viewing places identified in the East of England landscape framework or regional strategies
Local	Views across high quality landscape which might include features of interest, such as landmarks, which may be identified in the Local Plan
Community	Views of relatively common landscape elements, likely to be valued by the communities which experience the view
Limited	Views across poor quality landscape with a high degree of detracting or common elements

Visual Susceptibility

10.5.17 GLVIA3 (Ref. 101) notes that visual receptors “*most susceptible to change*”, include residents “*especially using rooms normally occupied in waking or daylight hours*” (para 6.36) and visitors engaged in outdoor recreation “*whose attention or interest is likely to be focused on the landscape and on particular views*” (para 6.33).

10.5.18 However, in paragraph 6.35, GLVIA3 (Ref. 101) notes that the divisions between categories are not always clear cut and “*in reality there will be a gradation in the susceptibility to change*”, (paragraph 6.35).

10.5.19 For the purposes of this assessment therefore, susceptibility of visual receptors to change will be defined as follows.

Table 10-5 Susceptibility to change of views

<i>Visual Receptor</i>	<i>Susceptibility to change</i>		
	<i>High</i>	<i>Medium</i>	<i>Low</i>
Occupation or activity	People living in the area or visiting areas because of their high landscape value	People passing through the area on designated routes	People working inside or passing through the area on public roads or railway lines
Degree of attention on the view	Views are an important part of the experience of the landscape	Views are relevant to the experience or activity but not central to it	Views are likely to be focused on the activity of the receptor, rather than the view
Degree of exposure to the view	Views are likely to be open	Views may be framed, partially screened or filtered	Views are likely to be limited to glimpses or are heavily screened

<i>Visual Receptor</i>	<i>Susceptibility to change</i>		
	<i>High</i>	<i>Medium</i>	<i>Low</i>
Length of exposure to the view	Views are likely to be experienced daily or for long periods of time	Views may be fleeting or experienced as a sequence of views moving through the area	Views are likely to be short

10.5.20 For the LVIA, GLVIA 3 (Ref. 101) will be followed for establishing the visual sensitivity of the receptors. It will use the following criteria for sensitivity of visual receptors.

Table 10-6 Sensitivity of visual receptors

<i>Classification</i>	<i>Sensitivity of visual receptors</i>
High	Activity resulting in a particular interest or appreciation of the view (e.g. residents with principal private views, or people engaged in outdoor recreation whose attention is focused on the landscape and where people might visit purely to experience the view, such as promoted viewpoints) and/or a view of national value (e.g. within/towards a designated landscape).
Medium	Activity resulting in a general interest or appreciation of the view (e.g. residents or people engaged in outdoor recreation that does not focus on an appreciation of the landscape, outdoor workers, people in schools or other institutional buildings and hotels and people passing through the landscape on defined scenic routes) and/or a view of local or community value (e.g. suburban residential areas, or agricultural land or urban areas).
Low	Activity where interest or appreciation of the view is secondary to the activity or the period of exposure to the view is limited (e.g. people at work, motorists travelling through the area or people engaged in outdoor recreation that does not focus on an appreciation of the landscape) and/or a view of limited value (e.g. featureless agricultural landscape, poor quality urban fringe).
Very Low	Activity where interest or appreciation of the view is inconsequential (e.g. people at work with limited views out, or drivers of vehicles in cutting) and/or very low value of existing view (e.g. industrial areas or derelict land).

Magnitude (nature of effect)

10.5.21 GLVIA 3 (Ref. 101) notes the use of different terms for ‘impact’ and ‘effect’ within LVIA. For the purpose of this assessment and in line with GLVIA3 (paragraph 1.15), the term ‘impact’ is defined as the action being taken and the ‘effect’ is defined as the change resulting from that action.

10.5.22 GLVIA 3 (Ref. 101) notes that magnitude of change is informed by combining considerations relating to the “*scale, extent and duration*” of effect (para 3.28). This includes the geographical extent of influence, the spatial extent of the effect, the level of integration of new features with existing elements, its duration and degree to which the effect is reversible.

10.5.23 Effects can be direct, where they involve a physical change to a defined element or characteristic of the landscape, or indirect, where effects are secondary and perceived on the wider pattern of elements or on visual amenity, away from a proposed site.

Magnitude of landscape Effect

10.5.24 Criteria for defining the level of magnitude are identified below in Table 10-7.

Table 10-7 Magnitude of Landscape Effect

<i>Magnitude</i>	<i>Typical Criteria Descriptors</i>
High	Total loss or large scale damage to key characteristics or distinctive features, and/or the addition of new features or components that will substantially alter the character or setting of the area.
Medium	Partial loss or noticeable damage to key characteristics or distinctive features, and/or the addition of new features and whilst notable or obvious, the change would not fundamentally alter the balance of the key characteristics.
Low	Limited loss or damage to key characteristics or alteration of common features, and/or the addition of new features such that post development the change would be discernible but the underlying pattern of characteristics would remain similar to the baseline condition.
Very Low	Barely noticeable loss, damage or alteration to key characteristics or features. The change would not influence the wider character and would be barely discernible or legible, approximating to a “no change” situation

Visual Magnitude

10.5.25 The magnitude of visual impact results from changes in the composition of views and or changes to the overall visual amenity. It includes combinations of the degree of change, the extent over which the changes will be visible, the period of exposure to the view and reversibility or permanence of the change and is classified as follows.

Table 10-8 Magnitude of Visual Effect

<i>Magnitude</i>	<i>Typical Criteria Descriptors</i>
High	Extensive change to the composition of the existing view (e.g. widespread loss of characteristic features or the widespread addition of new features within the view) and/or high degree of exposure to view (e.g. close, direct or open views). Where the Scheme, or a part of it, would become the dominant feature or focal point of the view.
Medium	Partial change to the composition of the existing view (e.g. loss of some characteristic features or the addition of new features within the view) and/or medium degree of exposure to view (e.g. middle-distance or partially screened views) where the Scheme, or a part of it, would form a noticeable feature or element of the view which is readily apparent to the receptor.
Low	Subtle change to existing view (e.g. limited loss of characteristic features or the addition of new features within the view) and/or low degree of exposure to view (e.g. long-distance, substantially screened or glimpsed views) where the Scheme, or a part of it, would be perceptible but not alter the overall balance of features and elements that comprise the existing view.
Very Low	Barely perceptible change to the existing view and/or very brief exposure to view, where only a very small part of the Scheme would be discernible, or it is at such a distance that it would form a barely noticeable feature or element of the view.

Significance of Effect

10.5.26 Landscape and visual effects will be classified by considering the relationship between the sensitivity of the receptor and the magnitude of impact using a matrix as shown in Table 10-9. However, should professional judgement consider that the effect is different to that in the matrix, or if it should fall between two categories, then a reasoned justification will be presented in the ES chapter.

Table 10-9 Classification of Effects Matrix

Sensitivity or value of resource / receptor	Magnitude of impact				
	High	Medium	Low	Very low	None
High	Major	Major / Moderate	Moderate / Minor	Minor / Negligible	Neutral
Medium	Major / Moderate	Moderate / Minor	Minor / Negligible	Negligible	Neutral
Low	Moderate	Minor	Minor / Negligible	Negligible / Neutral	Neutral
Very low	Minor	Negligible	Negligible / Neutral	Neutral	Neutral

10.5.27 Following the classification of an effect, clear statements will be made within the LVIA as to whether that effect is significant or not significant. As a general rule, major and moderate effects are considered to be significant, whilst minor and negligible effects are not considered to be significant. Where a combined significance is identified for example Minor / Negligible, professional judgement is used to determine whether Minor or Negligible or combination of the significance is more suitable for the specific receptor and impact. This will take account of whether the effect is temporary, permanent, or reversible, its duration/frequency and / or its likelihood of occurrence, and a full reasoned justification will be presented in the ES chapter.

Glint and Glare

10.5.28 The Ministry for Housing, Communities and Local Government's guidance 'Planning Practice Guidance for Renewable and Low Carbon Energy' (Ref. 99) notes that "*particular factors a local planning authority will need to consider include [inter alia] the effect on landscape of glint and glare*".

10.5.29 Glint and glare are defined as follows:

- Glint (specular reflection) may be produced as a direct reflection of the sun from the development; and
- Glare (diffuse reflection) is a continuous source of brightness in scattered lightwaves. Glare is significantly less intense than glint. (Source: based on 'The Development of Large Scale (>50kW) Solar PV Arrays in Cornwall', Cornwall Council, March 2012) (Ref. 111).

10.5.30 A general consideration of the potential for glint and glare from the Scheme to cause significant effects to landscape and visual receptors will be provided as part of the assessment.

10.6 Assumptions, Limitations and Uncertainties

- 10.6.1 Access to viewpoints may be restricted to publicly accessible areas and private land where access had been agreed. Where access is limited, site work will be undertaken from the nearest publicly accessible location and noted within the assessment. The consequential evaluation for impacts on some private and/or inaccessible viewpoints will be made, therefore, based upon the professional judgement of suitably qualified and experienced specialists.
- 10.6.2 The number of residential properties will be calculated from site assessment and use of address point data, where available, and any other mapping information where close access to the receptor was not possible and/or where address point data was not available.
- 10.6.3 Where appropriate, visual receptors will be grouped together as 'clusters' within the same receptor group at points where they are likely to experience the same level of effect.
- 10.6.4 The number of business receptors has been assumed as one per receptor group where businesses are situated in close proximity to one another and will experience the same visual effects. This is because it might not be possible to gain a clear understanding of the number of separate businesses in some areas.
- 10.6.5 Impacts on views from existing PRoW will be assessed.
- 10.6.6 Impacts on future visual receptors, including those subject to planning permission, will be assessed as part of the future baseline where developments are known and will be completed before the Scheme is under construction, or otherwise they will be treated as part of the cumulative effects assessment.
- 10.6.7 Only visual receptors within the ZTV that will experience a potentially significant adverse or beneficial effect will be assessed. Whilst there are likely to be a number of other receptors that will experience views of parts of the Scheme, these will not be recorded in detail where the significance of effect will be neutral at all timescales.
- 10.6.8 Existing vegetation outside the Scheme Boundary will screen or filter views from some locations and will be taken into account within the assessment of visual effects. Changes to this vegetation will potentially affect the visual effects caused by the Scheme but the management and retention of such vegetation is outside the control of this Scheme.

11. Noise and Vibration

11.1 Introduction

11.1.1 This section sets out the scope and methodology for the noise and vibration assessment of the Scheme.

11.2 Study Area

11.2.1 The study area for construction and operational noise effects will include receptors within 500m of the Sunnica East Site and Sunnica West Site. Based on the types of construction activities that may be required during site preparation and construction of the Scheme (e.g. site establishment, upgrade of existing tracks, construction of new tracks, erection of structures), and operational elements of the Scheme (solar farm plant, battery storage plant, substation), as described in **Chapter 2: The Scheme**, of this Scoping Report, it is not anticipated that noise from construction and operational phases of the Scheme would result in any significant effects on noise-sensitive receptors beyond 500m.

11.2.2 The study area for construction noise effects from the cable route will include receptors within 100m of the cable route corridors for Grid Connection Route A and Grid Connection Route B (including the Burwell National Grid Substation Extension). Based on the likely noisy construction activities that may be required during cable installation (e.g. stripping of topsoil, trenching, capping of topsoil, excavation and installation of jointing pits, as described in **Chapter 2: The Scheme**, of this Scoping Report), and the nature of the works physically moving along the cable route over time (such they are not fixed in one location for an extended period), it is not anticipated that noise from these activities would result in any significant effects on noise-sensitive receptors beyond 100m.

11.2.3 Operational noise effects of the Burwell National Grid Substation Extension transformer compound will include receptors within 500m of the compound location. As this is an extension to the existing substation, it is not considered the introduction of the compound and introduction of some additional sound sources would result in any significant effects on noise-sensitive receptors beyond this distance.

11.2.4 No operational noise or vibration effects are associated with Grid Connection Route A or Grid Connection Route B. No operational vibration effects are associated with the Sunnica East Site, the Sunnica West Site or the Burwell National Grid Substation Extension.

11.3 Planning Policy Context and Guidance

11.3.1 Legislation, planning policy and guidance relating to noise and pertinent to the Scheme comprises:

Legislation

- Control of Pollution Act 1974 (Ref. 24); and
- Environmental Protection Act 1990 (Ref. 27).

National Planning Policy

- NPS EN-1 (Ref. 5), with particular reference to Section 5.11 and Paragraphs 5.11.4 to 5.11.7, in relation to the assessment of noise;
- NPS EN-3 (Ref. 6), with particular reference to Paragraphs 2.4.2, in relation to the design of a project to mitigate noise impacts;
- NPS EN-5 (Ref. 7), with particular reference to Section 2.9 and Paragraphs 2.6.8 to 2.9.9, in relation to rain-induced noise on overhead transmission lines;
- NPPF (Ref. 8), with particular reference to Paragraph 170 and 180; and
- Noise Policy Statement for England (NPSE) (2010) (Ref. 112).

National Guidance

- Planning Practice Guidance: Noise (Ref. 113).

Local Planning Policy

- East Cambridgeshire District Local Plan Adopted April 2015 (Ref. 9), with particular reference to Policy ENV 9: Pollution;
- East Cambridgeshire District Council SPD Renewable Energy Development (Commercial Scale) October 2014 (Ref. 11);
- Forest Heath District Council Core Strategy Adopted 2010 (Ref. 12);
- Forest Heath and St Edmundsbury Councils: Joint Development Management Policies Document (last updated February 2015) (Ref. 13), with particular reference to Policy DM2: Creating Places - Development Principles and Local Distinctiveness, DM5: Development in the Countryside, DM8: Low and Zero Carbon Energy Generation, and DM14: Protecting and Enhancing Natural Resources, Minimising Pollution and Safeguarding from Hazards.

11.3.2 These policies identify the need for a site specific noise assessment to consider the impacts of construction / decommissioning and operational phase noise on local noise-sensitive receptors. NPS EN-1 (Ref. 5) also advises on relevant assessment guidance in the assessment of construction / decommissioning and operational noise, which have been considered in this Scoping Report.

11.4 Baseline Conditions

11.4.1 Following a desktop review, it is likely that the noise climate around the Scheme, and at surrounding noise sensitive receptors is dominated by road traffic (e.g. the A142, A14 and A11). Additional noise contributors are likely to include aircraft movements at RAF Mildenhall (located approximately 2km to the north of the Sunnica East Site), operations at the Worlington Quarry, (located within the Sunnica East Site boundary), the Greater Anglia Rail line (between Ely and Kennett stations) and farming activities on surrounding agricultural land.

11.4.2 The nearest identified noise-sensitive receptors to the Scheme (and approximate distances from the Scheme Boundary) are summarised below:

- Sunnica East Site
 - Residential properties, Acacia Close (Red Lodge) (approximately 450m)
 - Residential properties, Badlingham Road (approximately 300m)
 - Residential properties, East View, Freckenham (approximately 30m)
 - Residential properties, Walnut Grove, Freckenham Road (B1102) (Worlington), (approximately 20m)
- Sunnica West Site
 - Biggin Stud farmhouse, Newmarket Road (A142), Fordham (approximately 350m)
 - Residential properties, The Green (Snailwell) (approximately 300m)
 - Arran House Stud Bed & Breakfast, Norwich Road (Kennett) (approximately 120m)
 - RF Tillbrook & Sons farmhouse, La Hogue Hall (approximately 300m)
- Grid Connection Routes A and B
 - Fuller KW & Son farmhouse, Ness Farm, Ness Road (B1102) (approximately 15m)
 - Biggin Stud farmhouse, Newmarket Road (A142) (Fordham) (approximately 100m)
- Burwell National Grid Substation Extension
 - Residential properties, Weirs Drove, Burwell (approximately 300m)

11.5 Potential Effects and Mitigation

Construction and decommissioning noise and vibration (temporary effects)

- 11.5.1 The potential impacts throughout the works programme are likely to include noise due to works activities associated with the cable laying when carried out nearby to sensitive receptors. In practice, works noise levels and resulting impacts are likely to vary during the different phases of the Scheme depending upon the location of work sites and proximity of receptors. Adverse impacts on nearby receptors may occur during the construction phases although these would be of a temporary nature and have no lasting residual impact.
- 11.5.2 BS 5228:2009+A1:2014 Noise and vibration control on construction and open sites - Part 2: Vibration (Ref. 115) indicates that vibration effects generally only occur during heavy ground works (e.g. piling, excavation or ground compaction activities) when they are located less than 20m from sensitive locations. The effect depends on the type of works taking place, ground conditions, and receptor distance. Based on the separation distance between existing receptors and the cable route corridor for Grid Connection Routes A and B where excavation and ground compaction will take place, as well as the Sunnica East Site, Sunnica West Site and the Burwell National Grid Substation Extension, where there will be piling associated with PV and substation installations, and existing receptors, it is considered that there is a low potential to cause disturbance due to vibration to nearby receptors and therefore vibration associated with construction works is scoped out.
- 11.5.3 Design Manual for Roads and Bridges (DMRB) Volume 11 Section 3 Part 7 - HD 213/11-Revision 1: Noise And Vibration (Ref. 116) advises that:
- “A change in noise level of 1 dB $L_{A10,18h}$ is equivalent to a 25% increase or a 20% decrease in traffic flow, assuming other factors remain unchanged, and a change in noise level of 3 dB $L_{A10,18h}$ is equivalent to a 100% increase or a 50% decrease in traffic flow”.*
- 11.5.4 It is generally accepted that changes in noise levels of 1 dB(A) or less are imperceptible, and changes of 3 dB(A) are perceptible to the average human ear. While individual HGV movements may cause disturbance when in close proximity to a receptor, it is anticipated that the anticipated construction-related traffic set out in Paragraph 2.5.9 would result in no perceptible changes to overall road traffic noise levels across the study area. Any impacts of construction traffic noise would be temporary in nature, mitigated through the use of restricted routes and timings (refer to **Chapter 13: Transport and Access**, of this Scoping Report) and have no lasting residual impact, and would not be significant. As such noise associated with construction traffic is scoped out.

Operational noise (reversible long-term effects)

- 11.5.5 The potential effects during operation of the Scheme are likely to include noise from solar farm plant (e.g. inverters, transformers), and associated battery storage plant (e.g. cooling units, transformers) and the on-site substation. However it is expected that these can be controlled using appropriate noise control and mitigation measures in order to meet appropriate operational noise limits. No major vibration sources are envisaged to be introduced as part of the Scheme, and therefore it is proposed that operational vibration is scoped out of the assessment.
- 11.5.6 Due to the low level of trips associated with the operational phase of the Scheme (refer to **Chapter 13: Transport and Access**, of this Scoping Report) it is anticipated that operational traffic will result in no perceptible changes to overall road traffic noise levels across the study area, and would not be significant. As such, it is proposed to scope out noise associated with operational traffic.

11.6 Assessment Methodology

- 11.6.1 The criteria presented in **Chapter 5: EIA Methodology**, of this Scoping Report, will be followed in assigning categories to construction and operational phase noise impacts, and determining if the effects are significant.
- 11.6.2 Baseline noise monitoring will be carried out to establish the noise environment around the Scheme Boundary and representative of surrounding noise sensitive receptors. Monitoring will be undertaken at locations representative of noise-sensitive receptors around the Sunnica East Site and West Site and the cable route corridor. The monitoring procedures will follow guidance from BS 4142:2014 Methods for rating and assessing industrial and commercial sound (Ref. 115). Baseline noise surveys will be carried out post-scoping, and the scope and survey methodology will be agreed in consultation with the Environmental Health Officers at the East Cambridgeshire and Forest Heath District Councils, where possible.
- 11.6.3 Noise levels associated with construction and decommissioning works will be assessed (at chosen sensitive receptors, agreed with the Environmental Health Officers at the East Cambridgeshire and Forest Heath District Councils) using the data and procedures given in BS 5228:2009+A1:2014 Part 1: Noise (Ref. 114).
- 11.6.4 The impact of the proposed operational plant will be assessed following guidance from BS 4142:2014 (Ref. 115), based on information on the operating conditions and the levels of noise generated by the plant, as provided by the client. If a schedule of plant is not available, suitable criteria for operational noise limits will be provided based on baseline noise measurements.

Assumptions, Limitations and Uncertainties

- 11.6.5 Predictions of sound levels have an associated degree of uncertainty. Modelling and measurement processes have been carried out in such a way to reduce such uncertainty; however, it is unavoidable that some degree of prediction uncertainty remains.
- 11.6.6 Construction works noise levels will be predicted following guidance from BS 5228:2009+A1:2014 (Ref. 114) which provides a realistic estimate of sound propagation from construction plant. The predictions will use representative noise levels, sourced from industry standard guidance documents such as BS 5228:2009+A1:2014 (Ref. 114), for typical items of plant that are used in such developments as advised by the Applicant.
- 11.6.7 Predictions of operational plant and activities sound pressure levels will be undertaken following guidance to ISO 9613 Attenuation of sound during propagation outdoors – Part 2: General method of calculation (Ref. 117), which are based on an assumption of moderate downwind propagation, and hence could be considered as a worst-case calculation. However, the standard also indicates an estimated accuracy of ± 3 dB(A) in predicted levels.
- 11.6.8 Any measurement of existing ambient or background sound levels will be subject to a degree of uncertainty. Environmental sound levels vary between days, weeks, and throughout the year due to variations in source levels and conditions, meteorological effects on sound propagation and other factors. Hence, any measurement survey can only provide a sample of the ambient levels. Every effort will be made to ensure that measurements are undertaken in such a way as to provide a representative sample of conditions, such as avoiding periods of adverse weather conditions, and school holiday periods (which are often considered to result in atypical sound levels). However, a small degree of uncertainty will always remain in the values taken from such a measurement survey.

12. Socio-Economics and Land Use

12.1 Introduction

- 12.1.1 This section sets out the scope and methodology for the socio-economics and land use assessment of the Scheme.

12.2 Study Area

- 12.2.1 Impacts on potentially sensitive socio-economic receptors will be assessed by various geographical impact areas. Impact areas will depend on the nature and type of receptor being assessed, and will be set out in the ES.

12.3 Planning Policy Context and Guidance

- 12.3.1 There is no applicable legislation specific to the assessment of socio-economics. Planning policy and guidance relating to socio-economics and pertinent to the Scheme comprises:

National Planning Policy

- NPS EN-1 (Ref. 6) with particular reference to and 4.1.4 in relation to adverse effects and benefits, paragraph 4.2.1 in relation to EU directive requirements, paragraph 4.2.2 in relation to socioeconomics, paragraph 5.10.8 in relation to impacts on best and most versatile agricultural land, and paragraph 5.10.9 in relation to mineral safeguarding; and
- NPPF (Ref. 8) with particular reference to Section 6: Building a strong, competitive economy (paragraphs 80, 82-83), Section 12: Achieving well designed places (paragraphs 127-128) and Section 15: Conserving and enhancing the natural environment (paragraph 170b, in relation to impacts on best and most versatile agricultural land) and Section 17 (Facilitating the sustainable use of minerals).

Local Planning Policy

- East Cambridgeshire District Local Plan Adopted April 2015 (Ref. 9), with particular reference to Policy EMP 3 (New employment development in the countryside);
- East Cambridgeshire District Council SPD: Renewable Energy Development (Commercial Scale) October 2014 (Ref. 11) with particular reference to Section 8 (Access and Public Rights of Way), Section 9 (Site Restoration and Continuation of Agricultural Use);
- Forest Heath District Council Core Strategy Adopted 2010 (Ref. 12), with particular reference to Spatial Objective ENV3: Promoting Energy Schemes;
- Forest Heath and St Edmundsbury Local Plan: Joint Development Management Policies Document (February 2015) (Ref. 13), with particular reference to Policy DM2 (Creating Places – Development Principles and Local Distinctiveness) and Policy DM31 (Farm Diversification);
- Cambridgeshire and Peterborough Minerals and Waste Development Strategy (2011) (Ref. 16), with particular reference to Policy CS26 (Mineral Safeguarding Areas), CS23 (Sustainable Transport of Minerals), CS30 (Waste Consultation Areas) and Proposals Map C;
- Cambridgeshire and Peterborough Minerals and Waste Site Specific Proposals Development Plan Document (2012) (Ref. 17), with particular reference to Section 8.8 (Waste Consultation Areas) and Section 9.2 (Transport Safeguarding Areas);
- Cambridgeshire and Peterborough Minerals and Waste Local Plan Preliminary Consultation Draft (May 2018) (Ref. 18), with particular reference to Policy 7 (Mineral Allocation Areas, Mineral Allocation Consultation Areas and Mineral Safeguarding Areas), Policy 11 (Waste Allocation Areas and Waste Allocation Consultation Areas)

and Policy 17 Transport Infrastructure Allocation Areas (TIAAs) and Transport Infrastructure Consultation Areas (TICAs));

- Suffolk Minerals Core Strategy (2008) (Ref. 19) , with particular reference to Policy 5 (Mineral Safeguarding Areas) and Map B;
- Suffolk Minerals Specific Site Allocations (DPD) (2009) (Ref. 20), with particular reference to Site 19 (Worlington Quarry, Red Lodge) and Site 20 (Worlington Quarry, Red Lodge); and
- Suffolk Minerals and Waste Local Plan Submission Draft (2018) (Ref. 21), with particular reference to Chapter 17: Worlington.

12.4 Baseline Conditions

12.4.1 The potential impacts arising from the Scheme are assessed relative to the baseline conditions and benchmarked against regional and national standards where appropriate. The key indicators and measures of the areas will be established for:

- population and deprivation;
- an overview of the local economies;
- the local labour markets; and
- land use.

12.4.2 A high level summary of baseline conditions has been presented in the following paragraphs, based upon review of the following documents:

- 2001 and 2011 Census Data (Ref. 118 and Ref. 119);
- English Indices of Deprivation (Ref. 120);
- ONS (2016); UK Business Register and Employment Survey: provisional results 2017, revised results 2016 (Ref. 121);
- ONS (2016); Gross Value Added (Income Approach) (2015) (Ref. 122);
- ONS (2018); Annual Population Survey (January 2017 to December 2017) (Ref. 123);
- ONS (2018); Claimant Count: K02000001 UK: People: SA: Thousands (Ref. 124);
- ONS (2018); Local statistics (Ref. 125).
- Natural England (2010); Agricultural Land Classification map Eastern Region (ALC008) (Ref. 126).

Sunnica East Site

12.4.3 The Sunnica East Site is located within the district of Forest Heath. The land is primarily used for agriculture with some general industrial use, including a working quarry. As described in Paragraph 2.1.5, the quarry is planned to cease operation in 2025, at which point it will be restored to agricultural land with some habitat creation.

12.4.4 The Defra mapping of soils (Ref. 126) identifies the Sunnica East Site as being located within an area of land comprising Grade 3 (undifferentiated) soils and Grade 4 land in the easternmost corner. Under the Agricultural Land Classification (ALC) system⁸, Grade 3a land would form Best and Most Versatile Land (BMV) whereas Grade 3b would not therefore an ALC soil survey was commissioned, which identified the eastern land parcels of the Sunnica East Site as being formed of largely Grade 3b and 4 land, with a small pocket of Grade 3a towards the northern most section at Coldwell Head. The remaining land parcels will also be

⁸ The Agricultural Land Classification (ALC) system, provides a framework for classifying land according to the extent to which its physical or chemical characteristics impose long-term limitations on agricultural use. The ALC system divides agricultural land into five grades (Grade 1 'excellent' to Grade 5 'very poor'), with Grade 3 subdivided into Subgrade 3a 'Good' and Subgrade 3b 'Moderate'. ALC is based upon an assessment of limiting factors, including soils, climate and other physical limitations and the way in which these factors interact.

subject to an ALC soil survey. The ALC soils survey will be presented as a technical appendix to the ES.

- 12.4.5 Parts of the Sunnica East Site are located within a Minerals Safeguarding Area. These are areas where there are considered to be economic deposits of mineral, and are designated to make sure that mineral resources are taken into account in land use planning decisions. They do not automatically preclude development taking place, but are intended to ensure mineral resources are not unknowingly or needlessly sterilised. As described in Paragraph 2.1.5, Worlington Quarry is currently operational and will cease operation by October 2025, when it will be restored in accordance with the extant minerals consent. An extension is proposed to the north of Worlington Quarry within the Suffolk County Council Minerals Specific Site Allocation Development Plan (Ref. 17) and this is also included in the Suffolk Mineral and Waste Local Plan Submission Draft (Ref. 18), along with further extensions (see Figure 2-1d).
- 12.4.6 The population of Forest Heath grew by 13.8% between 2007 and 2017 (from 57,550 to 65,520) (Ref. 118 and Ref. 119). Forest Heath is a comparatively deprived borough and is the 11th most deprived local authority in the country (out of 326), as defined by the Index of Multiple Deprivation (Ref. 120). The borough is the most deprived in the East of England region by this measure.
- 12.4.7 Gross Value Added (GVA) per head was significantly lower in Forest Heath in 2015 (£21,040) compared to the average for the East of England (£23,970), and the average for Great Britain (£25,722) (Ref. 124 and Ref. 125). The sectors which contribute the most towards GVA in Forest Heath are the Distribution, Transport, Accommodation and Food Services sector; the Real Estate activities sector and the Public Administration, Education and Health sector. These three sectors are also the three which contribute the most towards GVA in the East of England economy (Ref. 125).
- 12.4.8 The broad industrial groups which contribute most to the Forest Heath economy in terms of employment are Accommodation and Food Services (14.6%), Manufacturing (10.3%) and Retail (10.1%) (Ref. 123). The retail industry is also an important employment provider within the East of England region (totalling 10% of the entire workforce). However, the other main employers in the East of England are different sectors than those with strong presence in Forest Heath, such as Health (11.5%) and Business Administration and Support Services (11%).
- 12.4.9 In 2017, approximately 50,500 people were employed in Forest Heath in 2017. The economic activity rate for people of working age (16-64) is 82.9%, which is higher than the East of England (80.8%) and national (78.4%) averages (Ref. 125). However, Forest Heath has a high rate of unemployment at 6.2% (Ref. 125). In comparison, the average for the East of England is 3.7% and the average for Great Britain is 4.5%. The proportion of residents which are working age (61.4%) is similar to that in the East of England in its entirety (61.3%) but less than the average for Great Britain (62.9%) (Ref. 125).

Sunnica West Site, Cable Route Corridors and Burwell National Grid Substation Extension

- 12.4.10 The Sunnica West Site, cable route corridors for Grid Connection Routes A and B and Burwell National Grid Substation Extension are located within the district of East Cambridgeshire and currently used principally for agriculture.
- 12.4.11 The Defra mapping of soils (Ref. 126) identifies the Sunnica West Site as being located within an area of land comprising Grade 3 (undifferentiated) soils, with a small pocket of Grade 4 land in the easternmost corner. An ALC soil survey was commissioned, which identified the Sunnica West Site (south) as being formed of largely Grade 3b and 4 land, with a small pocket of Grade 3a in the northern most corner. The Sunnica West Site (north) and Burwell National Grid Substation Extension will also be subject to an ALC soil survey. A detailed ALC survey is not proposed to be undertaken for the cable route corridor for Grid Connections A and B since these areas will be subject to temporary disturbance and soils will be replaced. The ALC soil survey will be presented as a technical appendix to the ES.

- 12.4.12 Parts of the Sunnica West Site are located within a Minerals Safeguarding Area. These are areas where there are considered to be economic deposits of mineral, and are designated to make sure that mineral resources are taken into account in land use planning decisions. They do not automatically preclude development taking place, but are intended to ensure mineral resources are not unknowingly or needlessly sterilised. In addition, the western land parcel of the Sunnica West Site is located adjacent to a Waste Consultation Area (SSP W8T Fordham Road, Snailwell), which is intended to ensure incompatible development from being permitted that would prejudice an existing or allocated waste management use. The same area is also within a Transport Safeguarding Area (SSP T2D: European Metal Recycling, Snailwell), which is intended to ensure that proposed development in, or on the edge, or in close proximity to a minerals and / or waste transport facility will not prejudice existing or future transport operations.
- 12.4.13 The population of East Cambridgeshire has grown from 79,900 in 2007 to 88,860 in 2017 (Ref. 118 and Ref. 119). This represents an increase of 11.2%. The East Cambridgeshire borough is the 262nd most deprived out of the 326 national boroughs (as defined by the indices of deprivation) (Ref. 120). None of the Lower Super Output Areas (LSOAs) in the borough are within the top 10% deprived boroughs in the country.
- 12.4.14 The East Cambridgeshire economy performs worse than the regional (East of England) economy in a number of measures. In East Cambridgeshire, GVA per head is £22,000 compared to the East of England average of £23,970 and the England and Wales average of £25,722 (Ref. 124 and Ref. 125). The Distribution, Transport, Accommodation and Food Services sector, the Manufacturing sector and Real Estate Activities sector make up the greatest percentages of gross value added to the East Cambridgeshire economy (Ref. 122).
- 12.4.15 The broad industrial groups which employ the most people in East Cambridgeshire are the Business Administration and Support services sector (11.4% of total employment) and the Manufacturing sector (11.3%) (Ref. 123). The Business Administration and Support services sector is also a large contributor to employment in the East of England economy (11% of total East of England employment). However, the Manufacturing sector only contributes towards 7.8% of employment in the entirety of the East of England with other industries such as health (11.5%) and Retail (10%) having greater prominence in the regional economy than in East Cambridgeshire.
- 12.4.16 In 2017, approximately 74,800 people were employed in East Cambridgeshire. The economic activity rate of 16-64 year olds was 80.6% which is very similar to the East of England rate (80.8%) and above the national rate (78.5%) (Ref. 125). In 2016, the unemployment rate for 16-64 year olds was 7.3% which was significantly higher than the regional (3.9%) and national (4.9%) rate (Ref. 125). The borough also has a lower proportion of working age residents (60.3%) than the regional (61.3%) and national (62.9%) averages (Ref. 125).

12.5 Potential Effects and Mitigation

- 12.5.1 For the purposes of this ES, due consideration will be given to the Scheme in terms of the following:
- temporary employment during the construction and decommissioning phases of the Scheme;
 - gross value added during the construction and decommissioning phases of the Scheme;
 - creation of long-term employment opportunities once the Scheme is operational including consideration of any existing employment uses on-site (principally related agricultural land uses); and
 - the change of land use within the Scheme Boundary and any impacts that occur due to this. Likely impacts are anticipated to arise from the displacement of agricultural land uses for the duration of the Scheme. Consideration will also be given to impacts experienced by users of recreational facilities, open space (including PRoW) and community facilities.

- 12.5.2 Mineral deposits within Minerals Safeguarding Areas will not be permanently sterilised by the Scheme and can be extracted, if required, after its decommissioning. It is considered that this satisfies the requirements of the Cambridgeshire and Suffolk Mineral Safeguarding policies, and therefore it is proposed to scope out effects on these areas. Consultation will be undertaken with the Cambridgeshire and Suffolk Minerals and Waste Officers to confirm this view.
- 12.5.3 The Scheme will not prejudice existing or future planned waste management or transport operations at Fordham Road, Snailwell or European Metal Recycling, Snailwell, and, therefore it is proposed to scope out effects on these areas.
- 12.5.4 It is anticipated that Worlington Quarry will have ceased operations and been restored in accordance with approved plans and therefore the Scheme will not prejudice existing or future mineral extraction at this site. It is therefore proposed to scope out effects on these areas. As described in Paragraph 12.4.5 and shown on Figure 2-1d, extensions to Worlington Quarry are proposed. Initial discussions with Suffolk County Council indicate that they would not accept development on these extensions until the minerals have been extracted. This will be taken into account as the Scheme design progresses.

12.6 Assessment Methodology

Baseline

- 12.6.1 Relevant policy will be reviewed at the local, regional and national levels to identify the key issues of relevance to the Scheme. This will include Local Plans, and any relevant SPG, NPS and NPPF measures.
- 12.6.2 A baseline assessment will be undertaken using a range of sources to provide a description of the socio-economic conditions within the local area and at borough level, including employment and the economy. This will be done using established statistical sources, such as:
- 2001 and 2011 Census Data (Ref. 118 and Ref. 119);
 - Business Register and Employment Survey (BRES) (2016) (Ref. 121);
 - Claimant Count Data (2018) (Ref. 124); and
 - Labour Force and Neighbourhood Statistics (2017/18) (Ref. 125).
- 12.6.3 As described in Paragraph 12.4.4 and 12.4.11, ALC soil surveys will be undertaken for the remaining land parcels at the Sunnica East Site, the Sunnica West Site (north) and the Burwell National Grid Substation Extension.

Assessment of effects (including significance)

- 12.6.4 An assessment of effects will be undertaken to assess the impact of the Scheme on the baseline socio-economic conditions. The methodology for assessing socio-economic impacts will follow standard EIA guidance and will entail:
- Assessment of the likely scale, permanence and significance of effects associated with socio-economic receptors; and
 - An assessment of the potential cumulative effects with other schemes within the surrounding area.
- 12.6.5 The assessment of potential socio-economic effects will use policy thresholds and expert judgment to assess the scale and nature of the effects of the Scheme against baseline conditions. For socio-economics there is no accepted definition of what constitutes a significant (or not significant) socio-economic effect. It is however recognised that effects are categorised based upon the relationship between the scale (or magnitude) of effect and the sensitivity (or value) of the affected resource or receptor.

12.6.6 As such, the socio-economic effects will be assessed on the basis of:

- Consideration of sensitivity to effects: specific values in terms of sensitivity are not attributed to socio-economic resources/receptors due to their diverse nature and scale, however the assessment takes account of the qualitative (rather than quantitative) 'sensitivity' of each receptor and, in particular, their ability to respond to change based on recent rates of change and turnover (if appropriate);
- Scale of effect: this entails consideration of the size of the effect on people or business in the context of the area in which effects will be experienced; and
- Scope for adjustment or mitigation: the socio-economic study is concerned in part with economies. These adjust themselves continually to changes in supply and demand, and the scope for the changes brought about by the Scheme to be accommodated by market adjustment will therefore be a criterion in assessing significance.

12.6.7 The assessment aims to be objective and quantifies effects as far as possible. However, some effects can only be evaluated on a qualitative basis. Effects are defined as follows:

- Beneficial classifications of effect indicate an advantageous or beneficial effect on an area, which may be minor, moderate, or major in effect;
- Negligible classifications of effect indicate imperceptible effects on an area;
- Adverse classifications of effect indicate a disadvantageous or adverse effect on an area, which may be minor, moderate or major in effect; and
- No effect classifications indicate that there are no effects on an area.

12.6.8 Based on consideration of the above, where an effect is assessed as being beneficial or adverse, the scale of the effect has been assigned using the below criteria:

- Minor: a small number of receptors are beneficially or adversely affected. The effect will make a small measurable positive or negative difference on receptors at the relevant area(s) of effect;
- Moderate: a noticeable number of receptors are beneficially or adversely affected. The effect will make a measurable positive or negative difference on receptors at the relevant area(s) of effect; and
- Major: all or a large number of receptors are beneficially or adversely affected. The effect will make a measurable positive or negative difference on receptors at the relevant area(s) of effect.

12.6.9 Those effects which are found to be moderate or major are considered to be 'significant' and those which are minor or negligible are 'not significant'.

12.6.10 Duration of effect is also considered, with more weight given to reversible long-term or permanent changes than to temporary ones. Temporary effects are considered to be those associated with the construction works. Long-term reversible effects are generally those associated with the completed and operational development. For the purposes of this assessment, short term effects are considered to be of one year or less, medium term effects of one to four years and long-term effects for five or more years.

12.6.11 There are no defined thresholds for assessing the effects of non-agricultural development on agricultural assets. The NPPF (Ref. 8) states that "*planning policies and decisions should contribute to and enhance the natural and local environment by ... recognising the intrinsic character and beauty of the countryside, and the wider benefits from natural capital and ecosystem services – including the economic and other benefits of the best and most versatile agricultural land, and of trees and woodland*". BMV land is defined in Annex 2 of the NPPF (Ref. 8) as land in Grades 1, 2 and 3a of the Agricultural Land Classification (ALC). Identification and consideration of BMV agricultural land is therefore necessary and the loss of BMV is a measure of the effect of the Scheme.

12.6.12 There is no definition of 'significance' either within EIA guidance or in the NPPF (Ref. 8) regarding the loss of agricultural land. However, the alternative use of 20 ha or more of BMV agricultural land for predominantly non-agricultural purposes, requires consultation with Natural England. Based on this threshold and on professional experience, the alternative use of 20 ha or more of BMV agricultural land would be identified as a potential significant adverse effect.

12.7 Assumptions, Limitations and Uncertainties

12.7.1 Information on current land use from landowners on the Sunnica East Site and Sunnica West Site will be required to determine existing employment generated within the existing Sites. In the absence of this information, good practice guidance and professional judgement will be applied.

13. Transport and Access

13.1 Introduction

- 13.1.1 This section outlines the anticipated traffic and transport scope of assessment for the Scheme. A Transport Scoping Note has also been prepared, which sets out the proposed scope specific to the future Transport Assessment, which is fully consistent with the approach set out below. Highways England and the County Highway Authorities will be consulted on the Transport Scoping Note to determine the scope and approach.

13.2 Study Area

- 13.2.1 Due to the nature of the Scheme, consideration will need to be given to a number of locations which could possibly be impacted. Junctions likely to require consideration include:

- B1085 Elms Road / A11 / B1085 Newmarket Road roundabouts;
- B1085 Newmarket Road / B1085 Dane Hill roundabout;
- A11 Off Slip / B1085 Dane Hill priority 'T' junction; and
- A14 / A142 Fordham Road (Junction 37).

- 13.2.2 Further to these specific junctions, those in the vicinity of the villages of Freckenham, Worlington, Chippenham, Snailwell and Burwell will also be considered. Exact details on the study area for assessment in terms of highway impact will be subject to discussion and agreement with Highways England and the County Highway Authorities, where possible.

13.3 Planning Policy Context and Guidance

- 13.3.1 Planning policy and guidance relating to transport and pertinent to the Scheme comprises:

National Planning Policy

- NPS EN-1 (Ref. 5), with particular reference to paragraphs 5.13.3, 5.13.4 and 5.13.5, which state that if a project is likely to have a significant transport implications, a Transport Assessment, Travel Plan and additional transport infrastructure should be provided to mitigate the impacts of the proposed development; and
- NPPF (Ref. 8), with particular reference to Paragraph 108 Part C, which states that any significant impacts from the development on the transport network (in terms of capacity and congestion), or on highway safety, can be cost effectively mitigated to an acceptable degree.

National Guidance

- Planning Practice Guidance, Travel Plans, Transport Assessments and Statements in Decision Taking (Ref. 127).

Local Planning Policy

- East Cambridgeshire District Local Plan Adopted April 2015 (Ref. 9), with particular reference to Policy COM 7: Transport Impact and Policy COM 8: Parking Provision.
- East Cambridgeshire District Council SPD Renewable Energy Development (Commercial Scale) October 2014 (Ref. 11), with particular reference to paragraph 8.3 part 3 which states that where renewable energy development is proposed which is likely to have significant transport implications (e.g. level of traffic movements) a Transport Statement will be required;

- Forest Heath District Council Core Strategy Adopted 2010 (Ref. 12), with particular reference to Policy CS12: Strategic Transport Improvement and Sustainable Transport and Spatial Objective T1: to ensure that new development is located where there are the best opportunities for sustainable travel and the least dependency on car travel.
- Forest Heath and St Edmundsbury Councils: Joint Development Management Policies Document (last updated February 2015) (Ref. 13), with particular reference to Policy DM45: Transport Assessments and Travel Plans which states that for major development and / or where a proposed development is likely to have significant transport implications, the Council requires the applicant to submit a Transport Assessment appropriate to the scale of the development and the likely extent of transport implications as well as a Travel Plan.

13.3.2 The policies set out above relate to how traffic and transport related impacts should be dealt with, in terms of identifying the level of impact, as well as any mitigation, which might be necessary. Therefore, in accordance with the policies and guidance set out above, a Transport Assessment will be prepared (scope and approach to be confirmed with Highways England and the County Highway Authorities), which identifies the impact of the Scheme, and what, if any, mitigation is required.

Industry Guidance

- Guidelines for the Environmental Assessment of Road Traffic (1993) (Ref. 128), provides guidance on examining the environmental impacts of developments in terms of traffic and transportation.

13.4 Baseline Conditions

13.4.1 Baseline conditions for the land within the Scheme Boundary will be described in detail in the ES, however for the purposes of this scoping study, they have been summarised below.

Existing Local Highway Network

13.4.2 The existing local highway network which surrounds the Scheme Boundary is described below:

- **Sunnica East Site** – the main part of the site is bound by the B1085 Elms Road to the north-east and the south, whilst the B1102 Freckenham Road and Mildenhall Road bound the site to the north-west. A small section of the site is located to the east of the B1085 Elms Road and is further bound by Golf Links Road to the north, the A11 to the east and agricultural land to the south.
- **Sunnica West Site** – an unclassified road bounds the Sunnica West Site (south) to the north-east and provides access to the La Hogue Farm Shop. It is linked to the A11 to the east and to another unclassified road to the north. Further unclassified roads bound the Sunnica West Site (south) to the north-west and the west with the southern and eastern boundaries provided by the A14 and A11 respectively. The Sunnica West Site (north) is bound by Fordham Road / Snailwell to the south, leading to the A142 Fordham Road to the west.
- **Grid Connection Routes A and B** – the cable route crosses several roads including Weirs Drove, Burwell, the B1102 Ness Road, the A142 Fordham Road, Chippenham Road, the unclassified road, which bounds the Sunnica West Site (south) to the north-east, the B1085 (between the A11 and Chippenham) and Elms Road
- **Burwell National Grid Substation Extension** – the existing Burwell National Grid Substation is located on Newnham Drove, off Weirs Drove in Burwell.

Existing Walking Facilities

- 13.4.3 Due to the location of the Scheme in rural Suffolk and Cambridgeshire, no footways are provided alongside the carriageways in the vicinity. There are a number of footpaths and bridleways (including PRow) which pass through the Sunnica East Site and Sunnica West Site or along boundaries. These will be reviewed to establish use where possible, and to identify if routes need to be diverted around the Sunnica East Site and/or Sunnica West Site to ensure that access to routes is still provided both during construction and operation of the Scheme.
- 13.4.4 The cable route corridors for Grid Connection Routes A and B also cross a number of PRow (as shown on Figure 2-1), and the Burwell National Grid Substation is located on Newnham Drive, which is an informal public access route. These will be reviewed to establish use and identify if routes need to be temporarily diverted during construction.

Existing Cycling Facilities

- 13.4.5 There are no on or off road cycling facilities within the vicinity of the Scheme Boundary; however the roads surrounding the Scheme Boundary are generally lightly trafficked and therefore would not deter cyclists. Further detail on the provision of cycle routes and facilities and any deficiencies which exist will be detailed within the Transport Assessment.

Existing Public Transport Facilities

- 13.4.6 At present, there are no bus stops located within the vicinity of the Sunnica East Site and Sunnica West Site with the nearest well served bus stops located on B1085 Turnpike Road in the village of Red Lodge. Further bus stops are located in Burwell, Worlington, Freckenham and Snailwell however these services are infrequent and generally serve these locations outside of the standard arrival and departure times.

13.5 Potential Effects and Mitigation

- 13.5.1 The nature of the Scheme is such that the greatest impact is likely to occur during the construction and decommissioning phases and this will be the focus of the assessment of transport effects presented in the ES.
- 13.5.2 The potential effects as a result of the Scheme during the construction and decommissioning phases are:
- Increase in HGV movements;
 - Increase in abnormal loads;
 - Travel to and from site by construction employees; and
 - Increase in delay to vehicles, pedestrians and cyclists due to increase in HGV movements.
- 13.5.3 Although both the Scheme is located near to Red Lodge, Newmarket and Burwell, which are the largest settlements immediately in the vicinity, it is not considered likely that visitors, be it during the construction, operational or decommissioning phases, will do so by foot, bicycle or public transport. Consideration will also be given to those users of local facilities which could be impacted by the Scheme. Therefore, this has not been detailed in this Scoping Report although for completeness these modes will be reviewed within the Transport Assessment.
- 13.5.4 As described in Paragraph 2.3.44, vehicular access to the Sunnica East Site, Sunnica West Site and Burwell National Grid Substation Extension during construction, operation and decommissioning is anticipated to be from the following locations:
- Sunnica East Site – B1085, approximately 700m north of its junction with the A11.
 - Sunnica West Site – Off the unclassified road which also provides access to the La Hogue Farm Shop, which is approximately 450m west of its junction with the A11.
 - Burwell National Grid Substation Extension – Off Newnham Drove / Weirs Drove, Burwell.

- 13.5.5 The locations of the accesses are not yet confirmed, with the above considered the most appropriate at this point in time. Accesses to the cable route corridor for Grid Connection Routes A and B are also yet to be confirmed. Discussions will be undertaken with the Cambridgeshire and Suffolk County Highway Authorities in relation to road crossings and access required for construction of the grid connection. Further detail on proposed access to the Scheme will be included within the ES, the Transport Assessment and an Access Strategy, which will be submitted with the DCO application.
- 13.5.6 As described in Paragraph 2.5.9, at this stage it is anticipated that as a worst case during the peak construction period, there could be up to 42 HGV deliveries per day for the Sunnica East Site and 22 HGV deliveries per day for the Sunnica West Site. There are anticipated to be up to six HGV deliveries per day for Grid Connection Route A and Grid Connection Route B. It is anticipated that as a worst case during the peak construction period, there could be up to two HGV deliveries per day for the Burwell National Grid Substation Extension. In addition, there will be Light Goods Vehicle (LGV) deliveries and vehicle movements associated with construction worker arrivals and departures. Construction traffic predictions will be confirmed in the ES.
- 13.5.7 The potential mitigation measures, which could be implemented during the construction and decommissioning phases, include:
- Restriction of HGV movements to certain routes, days of the week and times of the day; and
 - Upgrading of routes where considered necessary to cater for the additional vehicles.
- 13.5.8 Potential impacts during the construction and decommissioning phases are typically considered as short term, as defined in **Chapter 5: EIA Methodology**, as enduring for up to 12 months after construction.
- 13.5.9 During the operational phase, the Scheme will be manned by up to three people working across the Sunnica East Site and Sunnica West Site. Staff vehicles and those used by maintenance are primarily four wheeled drive vehicles and vans, with heavy good vehicles rarely accessing the site. Therefore, due to the low level of trips likely to be generated within the network peak hours, it is proposed to exclude operational phase transport effects from the EIA. Further detail of the operational stage transport arrangements will be set out in the ES and Transport Assessment to support this approach.

13.6 Assessment Methodology

Sources of Baseline Information and Consultation

- 13.6.1 To inform the assessment of the Scheme, information from a number of sources will be collected. The sources which will be used are set out below:
- Local travel information will be gathered from various sources including local bus operators and the local council;
 - Personal Injury Accident (PIA) data obtained from Suffolk County Council and Cambridgeshire County Council;
 - OS / Architectural Base Mapping will be used to ascertain an accurate geographical representation of the areas in the vicinity of the Scheme; and
 - Mode share data from the 2011 Census.
- 13.6.2 Peak hour traffic counts will be identified from historic data or WebTRIS information obtained from Highways England. Traffic counts will be undertaken, if considered necessary, at a number of locations in the vicinity of the Scheme to determine the baseline traffic conditions of the surrounding highway network. The extent of the traffic data and scope for any traffic surveys that may be required will be agreed with the County Highways Authorities, as statutory consultees, where possible.

- 13.6.3 To determine the impact of the Scheme, a number of scenarios will be assessed using the information collated above. The scenarios considered appropriate for assessment are:
- Baseline (2019) – AM, PM and Daily;
 - Peak Construction Year (2023) Without Development – AM, PM and Daily; and
 - Peak Construction Year (2023) With Development – AM, PM and Daily.
- 13.6.4 The peak construction year of 2023 is considered appropriate at this stage as it corresponds with the anticipated peak construction year for the purpose of the EIA, as described in **Chapter 5: EIA Methodology**, of this Scoping Report.
- 13.6.5 For the purposes of the EIA, the decommissioning assessment year is considered to be 2065. This year will not be considered in the Transport Assessment in terms of junction assessments as it is considered too far into the future to be able to accurately predict traffic flows or junction forms.
- 13.6.6 The Transport Scoping Note will be formally presented to Highways England, Suffolk County Council and Cambridgeshire County Council as statutory consultees in order to agree the scope of the transport related assessment. At this stage, it is not considered that junction capacity analysis will be required. This will be discussed and agreed with Highways England, Suffolk County Council and Cambridgeshire County Council, where possible.

Impact Assessment Methodology

- 13.6.7 In accordance with the IEMA guidance for assessing the environmental impacts of road traffic (Ref. 128), the following criteria will be considered in this assessment.
- Severance;
 - Driver delay;
 - Pedestrian delay;
 - Pedestrian and cyclist amenity;
 - Fear and Intimidation;
 - Accidents and safety; and
 - Hazardous loads.
- 13.6.8 The significance of effect is determined through consideration of two elements; the magnitude of the impact and the sensitivity of the receptor. The following sections outline the approach that would be used to determine these factors.
- 13.6.9 The overall effect will be determined by measuring the magnitude of the impact following mitigation measures (where applicable) against criteria including; the number of activities of the population affected; the type and sensitivity of the receptor; and the type of impact. Effects are defined as beneficial or adverse, with effects further defined using the following classifications:
- **Minor** – slight, very short, or highly localised impact of no significant consequence;
 - **Moderate** – limited impact (by extent, duration or magnitude) which may be considered significant; and
 - **Major** – considerable impact by extent, duration or magnitude) of more than local significance, or in breach of recognised acceptability, legislation, policy or standards.
- 13.6.10 The IEMA guidelines (Ref. 128) state that the magnitude of each impact should be determined as the predicted deviation from the baseline conditions. This will be done for the construction and decommissioning phases.

- 13.6.11 IEMA (Ref. 128) set out a number of criteria by which the magnitude of impact can be measured. These are outlined below. Many of the criteria do not provide specific thresholds by which such impacts can be measured, and as a result will be measured qualitatively where necessary.
- 13.6.12 **Severance** is defined in the IEMA guidelines (Ref. 128) as the “*perceived division that can occur with a community when it becomes separated by a major traffic artery*”. The term is used to describe a complex series of factors that separate people from places and other people. Severance may result from the difficulty of crossing a heavily trafficked road or a physical barrier created by the road itself. It can also relate to quite minor traffic flows if they impeded pedestrian access to essential facilities. IEMA guidelines suggest that a 30%, 60% and 90% increase in traffic flows will result in a low, medium, and high change in severance respectively.
- 13.6.13 **Driver Delay** will be determined through the analysis of junction capacity assessments, contained within the Transport Assessment, which will be measured in terms of change in delay per vehicle (in seconds) from the baseline situation. This criterion is considered to be applicable to all modes of transport using the public highway, namely cars, motorcycles, pedal cycles and buses.
- 13.6.14 **Pedestrian Delay** is considered to be affected by the changes in volume, composition or speed of traffic, in terms of their respective impacts on the ability of pedestrians to cross roads. In general, increases in traffic levels and/or traffic speeds are likely to lead to greater increases in pedestrian delay.
- 13.6.15 **Pedestrian and Cycle Amenity** is broadly defined as “*the relative pleasantness of a journey and is considered to be affected by traffic flow, traffic composition and pavement width/separation from traffic*”. The guidance suggests that a tentative threshold for judging the significance of changes in pedestrian and cycle amenity would be where the traffic flow is halved or doubled.
- 13.6.16 **Fear and Intimidation** is “*dependent on the volume of traffic, its HGV composition, and its proximity to people or the lack of protection caused by such factors as narrow pavement widths*”.
- 13.6.17 A detailed assessment of **Accidents and Safety** will be carried out by examination of road traffic accident data for the most recent five year period available. This analysis will be included in the Transport Assessment and undertaken to highlight if there are any existing safety issues on the local road network which may be exacerbated by the Scheme. The outcome of the assessment will be presented in the ES.
- 13.6.18 With regard to **Hazardous and Dangerous Loads**, the guidance indicates that “*the Statement should include a risk or catastrophe analysis to illustrate the potential for an accident to happen and the likely effect of such an event.*” Analysis of the road network within the study area indicates that there are no particular features, such as a significant vertical drop immediately beyond the carriageway, which would suggest that the transfer of materials poses a particular risk beyond that which would be expected on the general highway network. It is concluded that the impacts of Hazardous and Dangerous Loads do not warrant further consideration in the preparation of the ES. The projected impacts of the Scheme will be measured separately, dependent upon the receptor, for the construction and decommissioning periods of the Scheme.
- 13.6.19 In terms of **Severance, Pedestrian Delay, Pedestrian / Cycle Amenity** and **Fear and Intimidation**, the links within easy walking / cycling distance of the Sunnica East Site and Sunnica West Site will be used as receptors. For the construction impacts, the sensitivity of pedestrian routes and cycle routes is based on a qualitative assessment of the 2019 baseline scenario, taking into consideration the importance and attractiveness of the route and the destinations served. The thresholds are defined as:
- Neutral Sensitivity:
 - Rural road with no pedestrian / cycle facilities provided;

- Low Sensitivity:
 - Strategic vehicular route in a rural setting with pedestrian / cycle facilities;
- Medium Sensitivity:
 - Main vehicular route with pedestrian / cycle facilities provided in built up area; and
- High Sensitivity:
 - Lightly trafficked route provided in town centre setting.

13.6.20 In terms of **Driver Delay, Accidents and Safety and Hazardous Loads**, the impacts of the Scheme, both construction and decommissioning will be assessed at junction level. The sensitivity of these receptors will be expressed in terms of Ratio to Flow Capacity (RFC) or Degree of Saturation (DoS). The worst case peak hour assessments from the 2023 Without Scheme scenario junction modelling from the Transport Assessment for the junctions agreed with the County Highway Authorities will be assessed.

13.6.21 The thresholds for sensitivity of junctions have been defined as:

- Low Sensitivity: RFC / DoS below 90%
- Medium Sensitivity: RFC / DoS between 90% and 95%
- High Sensitivity: RFC / DoS above 95%

13.6.22 In order to determine the effect on specific receptors, both the sensitivity of receptors and the magnitude of impact, as outlined above, are considered. Table 13-1 below shows the matrix that has been used to determine the effect category. Effects which are classified as major or moderate are considered to be significant.

Table 13-1 Matrix for Determining Effect Category

<i>Impact Magnitude</i>	<i>Receptor Sensitivity</i>			
	<i>High</i>	<i>Medium</i>	<i>Low</i>	<i>Neutral</i>
<i>Major Adverse</i>	Major Adverse	Major Adverse	Moderate Adverse	Neutral
<i>Moderate Adverse</i>	Major Adverse	Moderate Adverse	Minor Adverse	Neutral
<i>Minor Adverse</i>	Moderate Adverse	Minor Adverse	Minor Adverse	Neutral
<i>Neutral</i>	Neutral	Neutral	Neutral	Neutral
<i>Minor Beneficial</i>	Moderate Beneficial	Minor Beneficial	Minor Beneficial	Neutral
<i>Moderate Beneficial</i>	Major Beneficial	Moderate Beneficial	Minor Beneficial	Neutral
<i>Major Beneficial</i>	Major Beneficial	Major Beneficial	Moderate Beneficial	Neutral

13.7 Assumptions, Limitations and Uncertainties

- 13.7.1 At this stage the exact extent of the study area cannot be confirmed in terms of traffic and transport as detailed discussions have not yet taken place with the Highways England and the County Highway Authorities. The area proposed as part of this Scoping Report is determined by AECOM's understanding of the road network and where the likely impacts will be; however it is anticipated that this will be formally agreed with Highways England and the County Highway Authorities. Any additional junctions requested by Highways England the County Highway Authorities will be assessed as part of both the Transport Assessment and the EIA.

14. Other Environmental Topics

14.1.1 The aim of the Scoping Stage is to focus the EIA on those environmental aspects that may be significantly affected by the Scheme. The following section provides a summary of other environmental topics which have been considered during the preparation of this Scoping Report. It is proposed that these topics can be addressed relatively briefly and qualitatively, without requiring modelling, detailed assessment, or standalone chapters. The Other Environmental Issues chapter of the ES will include a brief assessment of each of the topics mentioned below, supported by a technical note that will be appended to the ES where supplementary information is helpful. The generic EIA methodology set out in **Chapter 5: EIA Methodology**, of this Scoping Report, will not apply to this chapter; it may not be necessary for example to outline an assessment methodology or baseline conditions if it is quickly obvious that the impacts will be none or negligible.

14.2 Air Quality

14.2.1 Forest Heath District Council and East Cambridgeshire District Council, which are the respective district councils for the Sunnica East Site and Sunnica West Site, undertake routine ongoing monitoring of ambient air quality monitoring as part of their Local Air Quality Management responsibilities under Part IV of the Environment Act (1995) (Ref. 27).

14.2.2 There are no Air Quality Management Areas (AQMAs) within the vicinity of the Scheme Boundary. This infers that neither the Sunnica East Site nor Sunnica West Site are located in areas where the concentrations of nitrogen dioxide (NO₂) or fine particulate matter (PM₁₀) exceed their annual mean air quality objective. The nearest AQMA is in Newmarket, approximately 3km to the south west of the Sunnica West Site (south). This AQMA will not be affected by the Scheme.

14.2.3 All existing NO₂ diffusion tube monitoring sites operated by East Cambridgeshire District Council recorded concentrations below the relevant annual mean objective value of 40 micrograms per cubic metre (µg/m³) between 2013 and 2016.

14.2.4 In 2017, only one of the 58 NO₂ diffusion tube sites operated by Forest Heath District Council recorded concentrations above the objective value of 40 µg/m³; this monitoring site is located in Bury St Edmunds, approximately 17km from the Scheme Boundary.

14.2.5 The potential air quality impacts of the Scheme are considered to be:

- Impacts of dust arising during the construction and decommissioning phases of the Scheme; and
- Impacts of vehicle and plant emissions during the construction and decommissioning phases of the Scheme.

14.2.6 No effects are anticipated during operation due to the low number of anticipated vehicle movements and nature of the Scheme.

14.2.7 Following construction, the Scheme is expected to result in minimal alteration to the baseline situation in respect of air quality. No emissions are anticipated from the on-site infrastructure, and, as described in Paragraph 2.6.1, there will be minimal vehicle movements to and from the Sunnica East Site and Sunnica West Site. Therefore, consideration of air quality impacts during the operational phase is also proposed to be scoped out of the EIA.

14.2.8 The potential impacts from dust emissions arising from activities during the construction and decommissioning phases of the Scheme will be considered using an approach based on the Institute of Air Quality Management's (IAQM) guidance (2014) (Ref. 129) for assessing impacts from such activities. This is a screening assessment and risk-based qualitative assessment approach and is applied for air quality assessments throughout the UK. Mitigation measures will be identified and incorporated into the Framework CEMP. Through the use of a CEMP, no significant air quality impacts from dust generation are envisaged.

- 14.2.9 As part of this assessment, potential sensitive receptors will be identified for the construction and decommissioning of the Scheme based on a review of aerial photography, construction and decommissioning phasing plans and OS mapping, and with consideration to current guidance, including:
- Institute of Air Quality Management (IAQM) (2014) Guidance on the Assessment of Dust from Demolition and Construction (Ref. 129); and
 - Defra (2018) Local Air Quality Management Technical Guidance (TG16) (Ref. 130).
- 14.2.10 Construction and decommissioning related plant emissions are anticipated to represent a small source of emissions relative to ambient local conditions in the vicinity of the Scheme Boundary based on the scale of construction that will occur and the number of plant vehicles that will be required. However, suitable mitigation measures for plant and motorised equipment will be recommended based on advice prescribed in the IAQM (2014) (Ref. 129) guidance, and incorporated into the Framework CEMP.
- 14.2.11 The anticipated number of vehicles that will be in operation during the construction and decommissioning phases of the Scheme have been considered in the context of the guidance published by Environmental Protection UK (EPUK) / IAQM (2017) (Ref. 131), IAQM (2014) (Ref. 129) and EPUK (2010) (Ref. 132). The latter sets out the criteria to establish the need for an air quality assessment for the construction phase of a development as being “*Large, long-term construction sites that would generate large HGV flows (>200 movements per day) over a period of a year or more.*” As such, the predicted construction flows are well below the criteria and as such are not expected to adversely affect air quality. It is therefore proposed that construction traffic is scoped out.
- 14.2.12 It is therefore anticipated that incorporating air quality mitigation measures into the Framework CEMP will negate the need for a specific air quality chapter in the ES.

14.3 Glint and Glare

- 14.3.1 Glint and glare in this context is the effect of reflected sunlight causing harm or discomfort to a sensitive receptor. A glint can be defined as the momentary receipt of a bright light and a glare can be defined as the receipt of a bright light over an extended or continuous period of time (Ref. 137).
- 14.3.2 Glint and glare assessments are sometimes required to accompany planning applications for solar developments, depending on the determining authority’s judgement of their need. There are no guidelines setting out a particular methodological approach, but the receptors of interest are specified in the NPPF (Ref. 8) as well as guidance issued by the DCLG (Ref. 99) which states:
- “Particular factors a local planning authority will need to consider include... the effect on landscape of glint and glare and on neighbouring uses and aircraft safety.”*
- 14.3.3 As described in Section 10.6, the effect of glint and glare on landscape will be considered in the EIA, and presented within the LVIA chapter of the ES.
- 14.3.4 There are several aviation receptors identified in the wider area although the closest of these are RAF Mildenhall, RAF Lakenheath and Cambridge Airport, which are within 20km of the Sunnica East Site and Sunnica West Site. Other potential receptors include motorists using the A11 and A14 and ground based receptors including neighbouring residential properties, recreational receptors including users of PRoW, and users of nearby horse training areas.
- 14.3.5 Construction and decommissioning activities are expected to be undertaken in accordance with a CEMP. This will include information on how reflective surfaces are to be treated during construction and decommissioning phases with a view toward their final placement across the Sunnica East Site and Sunnica West Site. It is expected that avoidance of the effects of glint and glare will be considered as part of construction and decommissioning planning. Further, the scale of the Sunnica East Site and Sunnica West Site is such that their full areas will not be occupied for the duration of these phase activities and the movement of reflective surfaces will be temporarily localised to smaller areas on a rolling basis until works are complete. Based

on the nature of the activities, the distances to receptors and the use of a CEMP, construction and decommissioning effects are proposed to be scoped out of the assessment.

- 14.3.6 Operational effects are considered to be fixed and will last for the duration of the Scheme. The interaction of solar PV panels with sensitive locations, such as vehicular junctions or pedestrian crossings on roads is primarily influenced by their siting, as solar PV panels require orientation toward the sunpath, and the choice of materials, where more reflective, or specular surfaces create a higher chance of creating distraction through discomfort or disability glare.
- 14.3.7 As described in Paragraph 2.3.8, two possible options for panel orientation are being considered at this stage. The first option is for the modules to face to the south, which is commonly seen on existing UK solar farms. With this configuration, the modules are expected to be angled towards the south at a slope of 15 to 35 degrees from horizontal. The second option is for modules to be oriented towards the east and west, which is less commonly seen on existing UK solar farms. With this configuration, the modules are expected to be angled towards the east and west at a slope of 5 to 20 degrees from horizontal. This option removes the potential for the creation of mid-day glare toward the south from high sun in summer and sun at a lower elevation during winter months. This limits potential effects by panels to morning and afternoon hours where the sun sits lower in the sky.
- 14.3.8 The setback mounting of the solar PV panels within each of the Sunnica East Site and Sunnica West Site from their respective boundaries combined with the distance to potential receptors, limited orientation for angling of solar panels to west / east and angling of the panels from horizontal could help to limit how and where potential occurrences of glare could be created by the Sunnica East Site and Sunnica West Site.
- 14.3.9 Further, the dark colour and a matt material finish of the solar PV panels could minimise potential occurrences of reflected light, reducing the likelihood that glare conditions could be created from the panels themselves.
- 14.3.10 Based on the expected design, screening and distance to sensitive receptors, significant effects are not considered likely. Nevertheless, as the design develops, consideration will be given to the potential for solar reflections to impact on sensitive receptors. This will include undertaking calculations to determine whether the solar PV panels will be visible from sensitive locations and if a solar reflection could occur, whether it is likely to be a significant nuisance or hazard. If it is likely to be a nuisance or hazard, mitigation will be proposed.
- 14.3.11 As appropriate, the results and recommendations of any glint and glare calculations will be incorporated into the Scheme design and presented as a technical appendix to the ES. It is considered that this will negate the need for a specific glint and glare chapter in the ES.

14.4 Ground Conditions

- 14.4.1 The Model Procedures for the Management of Land Contamination (Ref. 133) indicates that the first step in evaluating land contamination risks is a Preliminary Risk Assessment (PRA). The objective of the PRA is to identify and evaluate potential land quality risks and development constraints associated with the Scheme and to construct an initial conceptual site model that can be used to inform future decision making and the design future ground investigation.
- 14.4.2 A Phase 1 PRA report is being prepared, covering land within the Scheme Boundary. The Phase 1 PRA will be presented as a technical appendix to the ES.
- 14.4.3 The Phase 1 PRA will include the following:
- Details of land within the Scheme Boundary and surrounding land including development history, geology, hydrogeology, hydrology, soil and groundwater quality and environmental setting;
 - Details of land designated for Mineral Safeguarding;
 - Details of any available site investigation reports for land within the Scheme Boundary;

- Details from a site walkover documenting:
 - The existing layout, current operations and condition of land within the Scheme Boundary, the property boundaries and immediately surrounding land;
 - The inspection of any site storm-water, foul and offsite effluent discharges;
 - A visual inspection (non-intrusive) of the external building fabric of potential structures and inspection of an asbestos register (if available);
 - A conceptual site model (CSM) and an evaluation of potential contamination linkages; and
 - Conclusions and recommendations based on the findings.
- 14.4.4 Based upon the phase 1 PRA, a number of environmental design and management measures will be employed as standard best practice to minimise impacts to both human health and controlled waters during the construction and decommissioning phase of the Scheme, including those listed in Table 14-1 below. These will be incorporated into the Framework CEMP.
- 14.4.5 Potential environmental impacts that will be avoided, prevented, reduced or offset through the implementation of these mitigation measures include:
- Human exposure through direct contact / inhalation / dermal uptake of contaminants;
 - Creation of preferential pathways and mobilisation of contamination;
 - Contamination of natural soils, driving of contamination into an aquifer during piling, contamination of groundwater with concrete, paste or grout;
 - Pollution and degradation of water quality of any underlying aquifer;
 - Infiltration and / or runoff into the local drainage / sewerage network - pollution of drainage and sewerage network and any adjacent surface water features;
 - Run-off and infiltration of contaminants from material stockpiles;
 - Contamination of drainage and sewerage network and/or groundwater; and
 - Spread of nuisance dusts and soils to the wider environment and local roads.

Table 14-1 Environmental Design and Management Measures to be included in the CEMP

Environmental Design and Management Measures

Regulatory / Guidance

1. Work will be carried out in accordance with relevant Construction Design Management Regulations 2015 (Ref. 134), details of these measures will be presented within the Health and Safety Plan (H&SP), and the CEMP.
 2. The CEMP will be prepared prior to commencement of works, setting out the management, monitoring, auditing and training procedures, and the mitigation measures that will be put in place during enabling works and construction, to maintain compliance with the applicable regulations. In order to reduce the likelihood of contamination and protect human health and controlled waters from effects related to ground conditions, the CEMP will include mitigation measures such as those presented here.
 3. A Pollution Response Plan will be drafted prior to the commencement of works on-site. The plan will outline key pollution mitigation measures including a Control of Substances Hazardous to Health (COSHH) / fuel inventory and key contacts to be notified in the event of a significant pollution incident, which may subsequently lead to the contamination of controlled waters. Any fuel and COSHH chemicals will be stored in accordance with the relevant Environment Agency Pollution Prevention Guidance (PPG) notes (while these guidance notes have been withdrawn they are still considered to provide a useful data source). Tanks and dispensing pumps will be locked when not in use to prevent unauthorised access. Information regarding spill prevention and disposal of COSHH items will be provided as part of the standard site induction presentations and during regular toolbox talks and the works progress.
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Environmental Design and Management Measures

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4. Piling will be carried out in accordance with Environment Agency Guidance Note on Piling / Penetrative Ground Improvement Methods on Land Affected by Contamination (Ref. 135) and ground investigations will inform the Foundation / Piling Works Risk Assessment which will define the appropriate piling methods and foundation design to mitigate risk.
 5. Specification of concrete used in foundations and building structures will be selected based on the results of the chemical composition of the site soil and groundwater. Guidance is provided by the BRE series 'Concrete in Aggressive Ground' (Ref. 136).
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Waste

6. Waste materials will be disposed of by the contractor(s) to appropriate recycling facilities or appropriately licensed landfills in line with a Construction Resource Management Plan (equivalent to a Site Waste Management Plan). The appropriate landfill for the disposal of any contaminated soil off-site will depend on the waste classification determined from the chemical analysis or Waste Acceptance Criteria testing as necessary.
 7. Waste effluent will be tested for appropriate physical and chemical parameters and, where necessary, disposed of at the correctly licensed facility by a licensed specialist contractor(s).
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Construction Related

8. Oils and hydrocarbons will be stored in designated locations with specific measures to prevent leakage and release of their contents, include the siting of storage area away from surface water drains, on an impermeable base with an impermeable bund that has no outflow and is of adequate capacity to contain 110% of the contents. Valves and trigger guns will be protected from vandalism and kept locked up when not in use. Details of appropriate storage and handling measures will be presented within the CEMP.
 9. Vehicles will be well maintained to prevent accidental pollution from leaks. Static machinery and plant will include drip trays beneath oil tanks / engines / gearboxes / hydraulics, which will be checked and emptied regularly via a licensed waste disposal operator.
 10. The Lead Flood Authority (LLFA) and the appropriate utility company will be consulted on the potential requirement for an oil interceptor and sediment trap at the point where site surface water runoff enters any sewerage network.
 11. A spillage Emergency Response Plan (ERP) will be produced (and could form part of the CEMP), which site staff will be required to have read and understood. On-site provisions will be made to contain a serious spill or leak through the use of booms, bunding and absorbent material.
 12. Appropriate handling and disposal of pile arisings, concrete, pastes and/or grouts during the laying of foundations.
 13. During the enabling and construction stage of work, the contractor(s) will employ dust suppression measures when necessary to prevent the potential mobilisation of contaminated dust particles and their migration off-site.
 14. Stockpiles and material handling areas will be kept as clean as practicable to avoid nuisance from dust. Dusty materials will be dampened down using water sprays in dry weather or covered.
 15. The length of time materials are stockpiled on-site before being removed for re-use, recycling or disposal is to be kept to a minimum and stockpiles are to be covered with tarpaulins prior to disposal.
 16. Dust generating equipment (e.g. mobile crushing) and screening equipment will be located to minimise potential nuisance impacts to receptors, as far as practicable.
 17. Complaints about dust will be investigated at the earliest opportunity and appropriate action taken to control the source or remedy the impact as appropriate.
 18. Access roads will be regularly cleaned and damped down with water.
 19. All vehicles entering and leaving the site during the construction period will pass through a wheel washing facility. Vehicles used to transport materials and aggregates will be enclosed or covered in a tarpaulin. Vehicle movements will be kept to a minimum and vehicle speeds within the site will be limited.
 20. Appropriate use of personal protective equipment (PPE) and implementation and adherence to Health & Safety Protocols, Plans and Procedures. Construction workers will remain vigilant of ground conditions at all times and will report to the Principal Contractor any suspect areas of potential contamination.
 21. Potentially contaminated made ground will be removed from excavations.
 22. Advice should be sought by an environmental specialist should materials suspected of being contaminated be uncovered.
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- 14.4.6 On-site activities will be limited to the maintenance of the infrastructure. During maintenance activities there may be the need to use oils, grease, fuels, lubricants or cleaning agents on-site. There is a small risk of chemical pollution arising from accidental spillages during these operations. An Operational Environmental Management Plan will be prepared following grant of DCO to address all operational related issues. This will include a spillage Emergency Response Plan (ERP), which maintenance staff will be required to have read and understood. On-site provisions will be made to contain a serious spill or leak through the use of booms, bunding and absorbent material. Operational activities are proposed to be scoped out of the assessment.
- 14.4.7 It is anticipated that the results and recommendations of the Phase 1 PRA, once incorporated into the Framework CEMP, along with the environmental design and management measures above, for the construction, operation and decommissioning phases, will negate the need for a specific ground conditions chapter in the ES.

14.5 Human Health

- 14.5.1 The design, including in-built buffers from sensitive receptors, will minimise any risk to human health resulting from the operation of the Scheme. Limited interactions with human health during construction, operational and decommissioning are possible, and will be covered elsewhere in the ES including:
- Air Quality (see Section 14.2 of this Scoping Report);
 - Land Quality (see Section 14.3 of this Scoping Report);
 - Noise (see Chapter 11 of this Scoping Report);
 - Transport and Access (see Chapter 13 of this Scoping Report); and
 - Visual Amenity (See Chapter 10 of this Scoping Report).
- 14.5.2 Power frequency electric, magnetic and electromagnetic fields (EMFs) arise from generation, transmission, distribution and use of electricity and occur around power lines and electric cables and around domestic, office or industrial equipment that uses electricity.
- 14.5.3 Electric fields are the result of voltages applied to electrical conductors and equipment.
- 14.5.4 Fences, shrubs and buildings can block electric fields. Magnetic fields are produced by the flow of electric current; however most materials do not readily block magnetic fields. The intensity of both electric fields and magnetic fields diminishes with increasing distance from the source.
- 14.5.5 Electric fields depend on the operating voltage of the equipment. Magnetic fields depend on the electrical currents flowing and are not significantly limited by most common materials.
- 14.5.6 Typically, ground-level magnetic fields from underground cables fall much more rapidly with distance than those from a corresponding overhead line, but can be higher at small distances from the cable.
- 14.5.7 There is no direct statutory provision in the planning system relating to protection from EMFs. Guidance published by DECC in 2012 (Ref. 139) suggests that guidelines for both public and occupational exposure published by the International Commission on Non – Ionizing Radiation Protection (ICNIRP) in 1998 (Ref. 140) should be taken into account.
- 14.5.8 The DECC guidance (Ref. 139) states that “*overhead power lines at voltages up to and including 132 kV, underground cables at voltages up to and including 132 kV and substations at and beyond the publicly accessible perimeter*” are not capable of exceeding the ICNIRP exposure guidelines and therefore no assessment is required for these and other types of infrastructure listed on the Energy Networks Association website (Ref. 141).
- 14.5.9 Therefore, since the assessment of EMFs is proposed to be scoped out of the ES, and other aspects will be covered elsewhere in the ES, it is not proposed to provide a specific chapter on Human Health. Nevertheless there will be appropriate signposting of health impacts in the ES to enable these to be identified.

14.6 Major Accidents or Disasters

- 14.6.1 The EIA Regulations (Ref. 1) have introduced a requirement to consider major accidents or disasters. It is considered likely that the original changes to the EIA Directive (0) to consider major accidents or disasters were made in order to bring certain other statutory requirements, mainly other EU Directives, within the overall 'wrapper' of EIA and the ES. The Directive and domestic Regulations cite two specific directives as examples of risk assessments to be brought within EIA, these are Directive 2012/18/EU of the European Parliament and of the European Council (which deals with major accident hazard registered sites) (Ref. 143) and Council Directive 2009/71/Euratom (which deals with nuclear sites) (Ref. 144). Neither of these Directives is relevant to the Scheme.
- 14.6.2 'Accidents' are considered to be an occurrence resulting from uncontrolled developments in the course of construction and operation of a development (e.g. major emission, fire or explosion). 'Disasters' are considered to be naturally occurring extreme weather events or ground related hazard events (e.g. subsidence, landslide, earthquake).
- 14.6.3 In the absence of established guidance on this topic, the following methodology has been adopted. In general, major accidents or disasters, as they relate to the Scheme, fall into three categories:
- Events that could not realistically occur, due to the nature of the Scheme or its location;
 - Events that could realistically occur, but for which the Scheme, and associated receptors, are no more vulnerable than any other development; and
 - Events that could occur, and to which the Scheme is particularly vulnerable, or which the Scheme has a particular capacity to exacerbate.
- 14.6.4 An exercise was undertaken to identify all possible major accidents or disasters that could be relevant to the Scheme. This list was drawn from a number of sources, including the UK Government's Risk Register of Civil Emergencies (Ref. 145). Major accidents or disasters with little relevance in the UK were not included. The long list of major accidents or disasters is presented in Appendix C. This long list was screened to identify the third group of major accidents or disasters listed above, to form a shortlist of events to be taken forward for further consideration.
- 14.6.5 Although the majority of the major accidents or disasters on the long list are already considered under other legislative or design requirements, this is not considered to be sufficient reason to automatically eliminate the major accident or disaster from any further consideration. This is consistent with the approach for other topics, for example that the need to comply with nature conservation legislation does not mean that ecology and nature conservation do not need to be considered in EIA. However, where it is concluded that the need for compliance is so fundamental, and the risk of any receptors being affected differently so remote, major accidents or disasters on the long list are not included on the shortlist.
- 14.6.6 Likewise, it is considered reasonable and proportionate to exclude certain receptor groups from the outset. Construction workers, as a receptor, can be excluded from the assessment, because existing legal protection is considered to be sufficient to minimise any risk from major accidents or disasters to a reasonable level. Legislation in force to ensure the protection of workers in the workplace includes:
- Health and Safety at Work etc. Act 1974 (Ref. 146);
 - The Management of Health and Safety at Work Regulations 1999 (Ref. 147);
 - The Workplace (Health, Safety and Welfare) Regulations 1992 (Ref. 148); and
 - Construction (Design and Management) (CDM) 2015 Regulations (Ref. 134).
- 14.6.7 Table 14-2 presents a short list of major accidents or disasters that are considered to need further consideration. Where the major accidents and disasters identified are not already being considered within the scope of existing technical assessments, they will continue to be reviewed with the design team to ensure the risks are understood and addressed through design as necessary. However, it is considered highly likely that all of these major accident or disaster types will be able to be removed from the scope of the assessment prior to publication

of the ES, as the design will ensure there is no real risk or serious possibility of the event interacting with the Scheme. All such scoping out will be reported in the ES.

Table 14-2 Major Accidents or Disasters Shortlisted for Further Consideration

<i>Major accident or disaster</i>	<i>Potential receptor</i>	<i>Comments</i>
Floods	Property and people in areas of increased flood risk.	Both the vulnerability of the Scheme to flooding, and its potential to exacerbate flooding, will be covered in the Flood Risk Assessment, and also reported in ES, both in terms of the risk to the Scheme and increased risk caused by the Scheme.
Fire	Local residents, habitats and species.	There may be some potential for fire as a result of the battery storage element of the Scheme. However, the battery energy storage system will include cooling systems, which are designed to regulate temperatures to within safe conditions to minimise the risk of fire.
Road accidents	Aquatic environment Road users	The risk posed by spillage from hazardous loads as a result of a road traffic accident during construction or decommissioning will be considered in the Flood Risk, Drainage and Water Resources chapter of the ES. The potential for glint and glare to affect road users will be considered within a technical appendix to the ES if any risks are identified. Mitigation will be considered and, where necessary, incorporated into the Scheme design.
Rail accidents	Rail users	The cable route corridor for Grid Connection Route B crosses the railway line connecting Newmarket to Ely. The crossing will be designed to meet the specific requirements of Network Rail and therefore the risk of a rail accident as a result of the crossing will be minimised.
Aircraft disasters	Pilots and aircraft	The potential for glint and glare to affect aircraft will be considered within a technical appendix to the ES if any risks are identified. Mitigation will be considered and, where necessary, incorporated into the Scheme design.
Flood Defence Failure	Employees	This will be covered in the Flood Risk Assessment and will also be reported in ES, both in terms of the risk to the Scheme and increased risk caused by the Scheme.
Utilities failure (gas, electricity, water, sewage, oil, communications)	Employees and local residents	The Scheme has the potential to affect existing utility infrastructure below ground. To identify any existing infrastructure constraints, both consultation and a desk based study will be undertaken. It is known that there is a high pressure gas main, which the cable route crosses, and is located within the Sunnica East Site.
Mining / Extractive Industry	Employees	There is the potential for current or past quarrying activity in the vicinity to lead to unstable ground conditions, particularly on the Sunnica East Site due to the active quarry on-site. However, the risk will be considered as part of the geotechnical design, ensuring that the risk is designed out.
Plant disease	Habitats and species	New planting may be susceptible to biosecurity issues, such as the increased prevalence of pests and diseases, due to climate change. The planting design will take account of biosecurity risks through a wider mix of species including some non-natives.

- 14.6.8 Where further design mitigation is unable to remove the potential interaction between a major accident or disaster and a particular topic, the relevant ES chapter will identify the potential consequence for receptors covered by the topic, and give a qualitative evaluation of the potential for the significance of the reported effect to be increased as result of a major accident or disaster.
- 14.6.9 The potential receptors of effects resulting from major accidents or disasters will be reported in the relevant topic chapter, and as such major accidents or disasters will not be a topic chapter in itself.

Telecommunications, Television Reception and Utilities

- 14.6.10 Solar farms have the potential to affect existing utility infrastructure below ground but are not at a height to affect above ground telecommunications. To identify any existing infrastructure constraints, both consultation and a desk based study will be undertaken. Consultation with relevant telecommunication and utilities providers is a routine part of development and consultees will include water, gas and electricity utilities providers and telecommunications providers as appropriate. Information obtained from consultation will be used to inform the Scheme design and appropriate protective provisions will be included in the DCO to ensure the protection of apparatus wherever any existing infrastructure has the potential to be affected by the Scheme.
- 14.6.11 Taking the above into account, it is considered unnecessary that a separate utilities chapter should be produced as part of the ES.

14.7 Waste

- 14.7.1 A description of the potential streams of construction waste and estimated volumes will be described within the description of development chapter of the ES. In addition to this, the CEMP, which would be produced following receipt of a DCO, will set out how waste will be managed on-site, and opportunities to recycle waste will be explored.
- 14.7.2 For the operational Scheme, an analysis of the main waste streams will be provided. There will be relatively little waste produced from the operation of the Scheme. It is also not intended to remove significant quantities of material from site during construction (there is no demolition works for example) and there is relatively little waste associated with solar PV and battery storage, except for general waste associated with office/administrative activities. There may however be a need to remove some soils from the Sunnica East Site and Sunnica West Site for treatment or disposal, if found to be contaminated and it is not practical to treat this on-site. However, where possible, soil arisings will be balanced through a cut and fill exercise to retain volumes on site.
- 14.7.3 As described in Paragraph 2.7.2, during decommissioning site infrastructure will be removed and recycled or disposed of in accordance with good practice and market conditions at that time.
- 14.7.4 Taking the above into account, it is not proposed to prepare a separate waste chapter as part of the ES.

15. Structure of the Environmental Statement

- 15.1.1 The ES will consist of two volumes and a Non-Technical Summary (NTS). This section provides a summary of each document that will form the ES.
- 15.1.2 **ES Volume 1: Main Report** – this will form the main body of the ES, detailing the results of the environmental assessment, likely significant effects arising from the Scheme, and the proposed mitigation measures. The ES will also identify opportunities for social and economic benefits and environmental enhancement. The ES is divided into a number of background and technical chapters, each being supported with figures and tabular information. ES Volume 1 will consider the environmental effects associated with a number of identified topics, which may receive significant environmental effects. Each topic will be assigned a separate technical chapter in the ES as follows:
- Chapter 5: Climate Change;
 - Chapter 6: Cultural Heritage;
 - Chapter 7: Ecology;
 - Chapter 8: Flood Risk, Drainage and Surface Water;
 - Chapter 9: Landscape and Visual Amenity;
 - Chapter 10: Noise and Vibration;
 - Chapter 11: Socio-Economics and Land Use;
 - Chapter 12: Transport and Access; and
 - Chapter 13: Other Environmental Topics.
- 15.1.3 In addition to the above, the following chapters will be provided as part of the ES:
- Chapter 1: Introduction;
 - Chapter 2: The Scheme;
 - Chapter 3: Alternatives and Design Evolution;
 - Chapter 4: Environmental Impact Assessment Methodology;
 - Chapter 14: Effect Interactions; and
 - Chapter 15: Summary of Environmental Effects.
- 15.1.4 **ES Volume 2: Technical Appendices** – A complete set of appendices will be provided for reference. These comprise of background data, technical reports, tables, figures and surveys which support the assessments in ES Volume 1.
- 15.1.5 **ES Non-Technical Summary (NTS)** – The NTS will be presented in a separate document and provides a concise description of the Scheme, the considered alternatives, baseline, assessment methodology, potential environmental effects and mitigation measures. The NTS will be designed to provide information on the Scheme in an accessible format which can be understood by a wide audience and to assist interested parties with their familiarisation of the project.

16. Summary and Conclusions

- 16.1.1 This Scoping Report represents notification under Regulation 8(1)(b) of the EIA Regulations that the Applicant will undertake an EIA in respect of the Scheme and produce an ES to report the findings of the EIA.
- 16.1.2 It also represents a formal application to PINS under Regulation 10 of the EIA Regulations for a 'Scoping Opinion' as to the information to be provided within the ES that will form part of the DCO application. This report has identified the environmental effects that are considered to have the potential to be significant and proposes the approach to be used in assessments that will be undertaken for the EIA to characterise and understand the significance of these effects. The prescribed consultees are invited to consider the contents of this report and comment accordingly within the statutory 42 day time period.
- 16.1.3 For clarity, Table 16-1 presents a summary of the proposed scope of the technical topics as well as which elements of these topics that are to be scoped out.

Table 16-1 Scope of Technical Topics and Elements to be Scoped Out

<i>Environmental Topic</i>	<i>Proposed Scope of Assessment</i>	<i>Element Proposed to be Scoped Out</i>
Climate Change	<p>Assessment of GHG emissions during construction, operation, and decommissioning.</p> <p>A statement on resilience of the Scheme to future climate changes will be provided.</p>	<p>In-combination impacts of temperature, sea level rise, precipitation change, and changes in wind patterns are proposed to be scoped out of the in-combination climate impact assessment.</p> <p>Sea level rise is proposed to be scoped out of the climate change resilience review.</p>
Cultural Heritage	<p>It is proposed to undertake an assessment of impact on both physical effects on heritage assets, and effects on their setting including changes to visual intrusion, noise, air quality, severance, access and amenity.</p> <p>Further archaeological work may be required, the extent and scope of which will be determined following completion of a cultural heritage archaeological desk-based assessment, and in consultation with Historic England and the County Archaeologists for Cambridgeshire and Suffolk.</p>	<p>Effects of Grid Connection Routes A and B on the setting of heritage assets.</p>

<i>Environmental Topic</i>	<i>Proposed Scope of Assessment</i>	<i>Element Proposed to be Scoped Out</i>
Ecology	<p>The EclA will include consideration of designated sites and protected and/or notable habitats and species. Effects considered include habitat loss, disturbance and indirect impacts such as watercourse pollution during construction. Operational effects include disturbance during maintenance, security lighting and management of on-site and adjacent habitats.</p> <p>A Preliminary Ecological Appraisal (PEA) has been undertaken, and further surveys will be undertaken as follows: botanical surveys, aquatic and terrestrial invertebrates, reptiles, Great Crested Newt, breeding (including barn owl, stone curlew, nightjar and woodlark) and wintering birds, bats, badgers and riparian mammals (water vole and otter).</p> <p>A habitat conditions assessment will also be carried out on land within the Scheme Boundary in order to perform a biodiversity net-gain assessment.</p>	Effects of the Grid Connection Routes A and B on ecological receptors during operation.
Flood Risk, Drainage and Surface Water	<p>Qualitative assessment of the effects of the Scheme, considering the risk to surface water bodies resulting from construction or decommissioning works or future operation activity using a source-pathway-receptor approach and development of mitigation to control potential effects.</p> <p>A Preliminary WFD assessment will be undertaken.</p> <p>A Surface Water Drainage Strategy and FRA will be prepared.</p>	Hydromorphological impacts on Internal Drainage Board waterbodies and WFD waterbodies and their significant tributaries as a result of crossings for the Grid Connections A and B, which would be installed using non-intrusive trenchless techniques.
Landscape and Visual Amenity	<p>Assessment of likely effects on landscape features and character, and views and visual amenity during construction, operation and decommissioning.</p> <p>Photomontages from key viewpoints will be prepared for both year 1 and year 15 of operation.</p>	None
Noise and Vibration	<p>Baseline noise monitoring will be undertaken at locations representative of surrounding noise-sensitive receptors.</p> <p>An assessment of construction and decommissioning plant noise, and operational plant will be undertaken.</p>	<p>Road traffic noise during the construction, operational and decommissioning phases of the Scheme.</p> <p>Ground-borne vibration from the construction, operation and decommissioning of the Scheme.</p> <p>Operational noise effects associated with Grid Connection Routes A and B.</p>

<i>Environmental Topic</i>	<i>Proposed Scope of Assessment</i>	<i>Element Proposed to be Scoped Out</i>
Socio-Economics and Land Use	Assessment of effects including temporary employment during construction and decommissioning and gross value added, creation of long-term employment opportunities during the operational phase, including consideration of any existing uses on-site, and change of land use including displacement of agricultural land and impacts on recreation, open space (including PRow) and community facilities.	Effects on Mineral Safeguarding Areas, Waste Consultation Areas and Transport Safeguarding Areas.
Transport and Access	Construction vehicle movements associated with the Scheme will be established and assessed in terms of impact on the local highway network. This will include an assessment of the impact on driver delay, pedestrians and cyclists and road safety. Any mitigation measures to be recommended.	Operational vehicle movements. Assessments for the decommissioning phase due to uncertainties in relation to future traffic flows and transport infrastructure.

16.1.4 Table 16-2 summarises the approach taken to the topics discussed in **Chapter 14: Other Environmental Topics**, of this Scoping Report.

Table 16-2 Scope of Approach to Other Environmental Topics

<i>Environmental Topic</i>	<i>Proposed Approach</i>
Air Quality	Qualitative dust assessment to identify measures to be included in a Framework CEMP. Suitable mitigation measures for construction and decommissioning plant and motorised equipment will be included in the Framework CEMP. Effects of construction traffic on air quality is proposed to be scoped out. Effect of Scheme operation and operational traffic on air quality is proposed to be scoped out.
Glint and Glare	An assessment will be undertaken to identify the potential for solar reflections to impact on sensitive receptors for both orientation options to inform design development.
Ground Conditions	A PRA will be included in the ES and the results and recommendations of this will be incorporated into the Framework CEMP. Maintenance activities during the operational phase will be managed through an Operational Environmental Management Plan and are proposed to be scoped out of the assessment.
Human Health	Human health (including air quality, land quality, noise, transport and access and visual amenity) will be covered elsewhere in the ES with appropriate signposting in the ES to enable these to be identified; EMFs are proposed to be scoped out.

<i>Environmental Topic</i>	<i>Proposed Approach</i>
Major Accidents and Disasters	Where the major accidents and disasters identified are not already being considered within the scope of existing technical assessments, they will continue to be reviewed with the design team to ensure the risks are understood and addressed through design as necessary. However, it is considered highly likely that all of these major accident or disaster types will be able to be removed from the scope of the assessment prior to publication of the ES, as the design will ensure there is no real risk or serious possibility of the event interacting with the Scheme. All such scoping out will be reported in the ES.
Telecommunications	Consultation and a desk based study to identify any existing infrastructure constraints and this information will be used to inform the Scheme design.
Waste	Description of the potential streams of construction, operation and decommissioning waste and estimated volumes will be described within the description of development chapter of the ES.

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Glossary

Air Quality Management Area (AQMA)	Places where air quality objectives are not likely to be achieved. Where an AQMA is declared, the local authority is obliged to produce an Action Plan in pursuit of the achievement of the air quality objectives.
Baseline conditions	The conditions against which potential effects arising from the Scheme are identified and evaluated.
Battery energy storage system	Proposed development of a battery storage installation and associated development to allow for the storage, importation and exportation of energy to the National Grid.
Burwell National Grid Substation Extension	The grid connection location for the Scheme, which will require an extension to the Burwell National Grid Substation and located at Weirs Drove in Burwell.
Cable Route Corridor	Approximately 200m wide corridor, which represents the maximum extent of land within which the cable route would be located.
Construction Environmental Management Plan (CEMP)	A site specific plan developed to ensure that appropriate environmental management practices are followed during the construction phase of a project.
Cumulative Effects	<p>Effects upon the environment that result from the incremental impact of an action when added to other past, present or reasonably foreseeable actions.</p> <p>Each impact by itself may not be significant but can become a significant effect when combined with other impacts.</p>
Environmental Impact Assessment (EIA)	A process by which information about environmental effects of a proposed development is collected, assessed and used to inform decision making. For certain projects, EIA is a statutory requirement.
Environmental effect	The consequence of an action (impact) upon the environment such as the decline of a breeding bird population as a result of the removal of hedgerows and trees.
Environmental impact	The change in the environment from a development such as the removal of a hedgerow.
Environmental Statement	A document produced in accordance with the EIA Directive as transposed into UK law by the EIA Regulations to report the results of an EIA.
Exception Test	Applied to certain forms of development in Flood Zones 2 and 3 (vulnerability classification depending) to determine if the development is suitable.

Preliminary Ecological Appraisal (PEA)	Comprises a desk study, Phase 1 Habitat Survey (which categorises habitats to a broad level using the methodologies set out by JNCC (1993 as amended) guidelines) and Protected Species Scoping survey (which includes preliminary survey work to identify the presence or potential presence of legally protected species).
Flood Zone 3	This zone comprises land assessed as having a 1 in 100 or greater annual probability of river flooding (>1%), or a 1 in 200 or greater annual probability of flooding from the sea (>0.5%) in any year.
Flood Zone 2	This zone comprises land assessed as having between a 1 in 100 and 1 in 1,000 annual probability of river flooding (1% – 0.1%), or between a 1 in 200 and 1 in 1,000 annual probability of sea flooding (0.5% – 0.1%) in any year.
Geophysical survey	Geophysical survey is a non-intrusive pre-construction archaeological evaluation technique that exploits a variety of physical or chemical characteristics of rocks and soils etc, in an attempt to locate underground features of archaeological interest. Types of geophysical survey include magnetometer survey, magnetic susceptibility survey and resistivity survey.
Geotechnical Investigation	Investigation into the physical properties of the substrata underlying a site.
Grid Connection Route A	The cable route between the Sunnica East Site and Sunnica West Site.
Grid Connection Route B	The cable route from Sunnica West to the Burwell National Grid Substation Extension.
Ground mounted solar PV panel arrays	These are the structures that are fixed to the ground and onto which the solar PV modules are attached.
Habitats Regulations	The implementation of the habitats Directive within the UK and the principle mechanism for protecting European Protected Species and Habitats
Heavy Goods Vehicle (HGV)	Vehicles with 3 axles (articulated) or 4 or more axles (rigid and articulated).
Historic Environment Record	The record of archaeological and built heritage features in a county or district, usually held and maintained by the relevant County Council.
Interface cables	Buried high-voltage cables linking the on-site substations to the Burwell National Grid substation.
Inverter	Inverters convert the direct current (DC) electricity collected by the PV modules into alternating current (AC), which allows the electricity generated to be exported to the National Grid. BESS also use inverters to convert between DC and AC. The batteries function in DC and electricity must be converted to AC to pass into or from the grid.

Jointing pit	Underground structures constructed at regular intervals along the cable route to join sections of cable and facilitate installation of the cables into the buried ducts.
Link boxes	Underground chambers or above ground cabinets next to the cable route housing low voltage electrical earthing links.
Mitigation	Measures including any process, activity, or design to avoid, prevent, reduce, or, if possible, offset any identified significant adverse effects on the environment.
NPS	National Policy Statement. National Policy Statements are produced by government. They comprise the government's central policy documents for the development of nationally significant infrastructure.
Nationally Significant Infrastructure Projects (NSIP)	NSIPs are large scale developments such as certain new harbours, power generating stations (including wind farms), highways developments and electricity transmission lines, which require a type of consent known as 'development consent' under procedures governed by the Planning Act 2008 (and amended by the Localism Act 2011).
On-site cables	The cables, which transmit electricity from the transformers to the onshore project substation.
On-site substation	A compound containing electrical equipment to enable connection to the national grid. We are currently thinking that the system would be HVAC (high voltage alternating current) at 132kV but this needs research to be final decision.
Preliminary Environmental Information (PEI)	PEI is defined in the EIA Regulations as: " <i>information referred to in Regulation 14(2) which –</i> <i>(a) has been compiled by the applicant; and</i> <i>(b) is reasonably required for the consultation bodies to develop an informed view of the likely significant environmental effects of the development (and of any associated development).</i> "
Preliminary Risk Assessment	Report that presents a summary of readily-available information on the geotechnical and/or geo-environmental characteristics of the site and provides a qualitative assessment of geo-environmental and/or geotechnical risks in relation to the proposed development.
Principal Aquifer	These are layers of rock or drift deposits that have high intergranular and/or fracture permeability - meaning they usually provide a high level of water storage. They may support water supply and/or river base flow on a strategic scale. In most cases, principal aquifers are aquifers previously designated as major aquifer.
Receptor	A component of the natural or man-made environment that is affected by an impact, including people.

Scheme	The Sunnica Energy Farm comprising solar PV and battery storage on the Sunnica East Site and Sunnica West Site, and associated development for connection to the national transmission system via Grid Connection Routes A and B, and the Burwell National Grid Substation Extension.
Scheme Boundary	The maximum extent of land potentially required temporarily and/or permanently for the construction, operation and maintenance of the Scheme.
Secondary A aquifer	These are permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. These are generally aquifers formerly classified as minor aquifers.
Secondary B aquifer	These are predominantly lower permeability layers which may store and yield limited amounts of groundwater due to localised features such as fissures, thin permeable horizons and weathering. These are generally the water-bearing parts of the former non-aquifers.
Sequential Test	Risk based assessment from NPPF to encourage new development towards areas of least flood risk.
Setting	The surroundings within which a heritage asset is experienced and any element, which contributes to the understanding of its significance.
Solar Farm	Proposed generating station comprised of solar PV modules mounted on racks and connected via associated infrastructure to the national grid.
Source Protection Zone (SPZ)	SPZs show the risk of contamination from any activities that might cause pollution to groundwater sources such as wells, boreholes and springs used for public water supplies. The closer the activity, the greater the risk. SPZs can comprise of up to three main zones (inner, outer and total catchment). A fourth zone of special interest can also occasionally be applied to a groundwater source.
Sunnica East Site	The maximum extent of land shown on Figure 1-2 located near to Worlington in Suffolk. This boundary is indicative and will be refined as the Scheme evolves and having regard to consultation.
Sunnica West Site	The maximum extent of land shown on Figure 1-2 located near to Chippenham in Cambridgeshire. This boundary is indicative and will be refined as the Scheme evolves and having regard to consultation.
Sustainable drainage systems (SUDS)	Surface water drainage systems developed in line with the ideals of sustainable development (e.g. swales, ponds, basins, filtration flow control, etc).

Transformers	Transformers control the voltage of the electricity generated across the site before it reaches the On-site substations.
Visual receptors	People with views of the development or associated activities. These are located within the visual envelope and are typically residents, motorists, pedestrians, recreational users in residential areas on publicly accessible roads, footpaths and open spaces.
Water Framework Directive	<p>The Water Framework Directive ("WFD") introduced a new system for monitoring and classifying the quality of surface and ground waters.</p> <p>The Directive requires that Environmental Objectives be set for all surface waters and groundwater to enable them to achieve Good Ecological Potential/Status by a defined date.</p>
Zone of Theoretical Visibility	The zone within which views of a proposed development may be experienced, as determined by analysis of OS data and field survey. It is influenced by many factors including topography and intermediate visual intrusions, such as blocks of woodland and buildings.

Abbreviations

AC	Alternating current
AD	Anaerobic Digestion
ADS	Archaeological Data Service
agl	Above ground level
ALC	Agricultural Land Classification
AOD	Above Ordnance Datum
AONB	Area of Outstanding Natural Beauty
AQMA	Air Quality Management Area
BAP	Biodiversity Action Plan
BIAB	British and Irish Archaeological Bibliography
BRE	Building Research Establishment
BS	British Standard
BGS	British Geological Survey
CCTV	Closed circuit television
CDM	Construction Design Management
CEMP	Construction Environmental Management Plan
CH ₄	Methane
CIEEM	Chartered Institute of Ecology and Environmental Management
COPA	Control of Pollution Act 1974
COSHH	Control of Substances Hazardous to Health
CSM	Conceptual site model
CTMP	Construction Traffic Management Plan
CWS	Country Wildlife Site
DAS	Design and Access Statement
DC	Direct current

DCO	Development Consent Order
DECC	Department for Energy and Climate Change
DEFRA	Department for Environment, Food and Rural Affairs
DoS	Degree of Saturation
DPD	Development Plan Document
EclA	Ecological Impact Assessment
EIA	Environmental Impact Assessment
EMF	Electromagnetic fields
EPS	European Protected Species
EPUK	Environmental Protection UK
ERP	Emergency Response Plan
ES	Environmental Statement
EU	European Union
FRA	Flood Risk Assessment
GHG	Greenhouse gas
GLVIA3	Guidelines for Landscape and Visual Impact Assessment, Third Edition
GRP	Glass reinforced plastic
GVA	Gross Value Added
GW	Gigawatt
GWDTE	Groundwater Dependent Terrestrial Ecosystem
H&SP	Health and Safety Plan
HDD	Horizontal Directional Drilling
HER	Historic Environmental Record
HFCs	Sulphur hexafluoride
HGV	Heavy goods vehicle
HSI	Habitat Suitability Index
HMSO	Her Majesty's Stationary Office

HRA	Habitat Regulation Assessment
HVAC	Heating, ventilation and cooling
IAQM	Institute of Air Quality Management
ICE	Inventory of Carbon and Energy
ICNIRP	International Commission on Non – Ionizing Radiation Protection
IDB	Internal Drainage Board
IEMA	Institute of Environmental Management and Assessment
INNS	Invasive Non-Native Species
IQAM	Institute of Air Quality Management
kV	Kilovolt
LCA	Landscape Character Area
LFA	Lead Flood Authority
LGV	Light Goods Vehicle
LLFA	Lead Local Flood Authority
LSOA	Lower Super Output Area
LVIA	Landscape and Visual Impact Assessment
MAGIC	Multi-Agency Geographic for the Countryside
MHCLG	Ministry of Housing, Communities and Local Government
MW	Megawatts
N ₂ O	Nitrous oxide
NCA	National Character Area
NERC	The Natural Environmental and Rural Communities
NF ₃	Nitrogen trifluoride
NHLE	National Heritage List for England
NNR	National Nature Reserve
NO ₂	Nitrogen Dioxide
NPPF	National Planning Policy Framework

NPS	National Policy Statement
NPSE	Noise Policy Statement for England
NSIP	Nationally Significant Infrastructure Project
NTS	Non-Technical Summary
ONS	Office for National Statistics
OS	Ordnance Survey
PAS	Portable Antiquities Scheme
PEA	Preliminary Ecological Appraisal
PEI	Preliminary Environmental Information
PFCs	Perfluorocarbons
PFRA	Preliminary Flood Risk Assessment
PIA	Personal Injury Accident
PM10	Particulate matter
PPE	Personal protective equipment
PPG	Pollution Prevention Guidance
PRA	Preliminary Risk Assessment
PRoW	Public Right of Way
PRV	Protected Road Verge
PV	Photovoltaic
PWS	Private Water Supplies
RBMP	River Basin Management Plan
RFC	Ratio Flood Capacity
RPG	Registered Park and Garden
SAC	Special Area of Conservation
SF ₆	Sulphur hexafluoride
SFRA	Strategic Flood Risk Assessment
SoCC	Statement of Community Consultation

SoS	Secretary of State
SPA	Special Protection Area
SPD	Supplementary Planning Document
SPZ	Source Protection Zone
SRPR	Suffolk Rare Plant Register
SSSI	Site of Special Scientific Interest
SuDS	Sustainable Drainage System
tCO ₂ e	Tonnes of carbon dioxide equivalent
TPO	Tree Preservation Order
UK	United Kingdom
UKBAP	UK Biodiversity Action Plan
UKCP18	UK Climate Projections 2018
UKIP	UK Climate Impacts Programme
UKPN	The UK Power Network
W	Watts
WFD	Water Framework Directive
WSI	Written Scheme of Investigation
	Waste Transfer Note
ZTV	Zone of Theoretical Visibility

Appendix A – Transboundary Effects Screening Matrix

- A.1 Regulation 32 of the Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 requires the consideration of any likely significant effects on the environment of another European Economic Association (EEA) State.
- A.2 Guidance upon the consideration of transboundary effects is provided in the Planning Inspectorate’s Advice Note 12: Development with significant transboundary impacts consultation¹.
- A.3 The following screening matrix provides the consideration of transboundary effects for the proposed scheme, taking guidance from Advice Note 12 (Annex).

Table A1 Screening Matrix for Possible Substantial Effects on the Environment of Another EEA State

<i>Criteria and Relevant Considerations</i>	<i>Commentary with Regard to Proposed Scheme</i>
<p>Characteristics of the development</p> <ul style="list-style-type: none"> • Size of the development • Use of natural resources • Production of waste • Pollution and nuisance • Risk of accidents • Use of technologies 	<p>The resources required for the construction of the Scheme are likely to be obtained from the global market but it is envisaged that materials would be obtained locally wherever possible. No waste, nuisances or accidents are likely to extend beyond the border of the UK. No novel technologies are proposed that have potential for transboundary effects.</p>
<p>Location of development (including existing use) and Geographical area</p> <ul style="list-style-type: none"> • What is the existing use? • What is the distance to another EEA state? (Name EEA state)? • What is the extent of the area of a likely impact under the jurisdiction of another EEA state? 	<p>The Scheme’s closest EEA boundary is France, located approximately 175km to the south-east.</p> <p>No impacts are likely to extend beyond the jurisdiction of the UK, with the exception of potential greenhouse gas emissions. The latter is expected to be minimal given the nature of the Scheme, which will not emit GHG emissions during its operation (except for any emissions associated with maintenance vehicles and repair works).</p>
<p>Environmental importance</p> <ul style="list-style-type: none"> • Are particular environmental values (e.g. protected areas – name them) likely to be affected? • Capacity of the natural environment. • Wetlands, coastal zones, mountain and forest areas, nature reserves and parks, Natura 2000 sites, areas where environmental quality standards already exceeded, densely populated areas, landscapes of historical, cultural or archaeological significance. 	<p>There are a number of European statutory designated nature conservation sites within 10km of the Scheme.</p> <p>The potential for significant effects relating to these designated sites will be accounted for in the EIA. However, it is not anticipated that there is potential for transboundary effects (and therefore any effects on important environmental receptors beyond the UK).</p>
<p>Potential impacts and carrier</p> <ul style="list-style-type: none"> • By what means could impacts be spread (i.e. what pathways)? 	<p>The only potential transboundary environmental impact which is considered likely is from greenhouse gas (GHG) emissions. These emissions would be spread by atmospheric processes and are anticipated to be minimal given the nature of the Scheme. The Scheme is expected to offset GHG emissions through the generation of clean electricity, that otherwise would have been generated from a typical fuel mix comprising technologies such as gas fired power stations for example.</p>

¹ <https://infrastructure.planninginspectorate.gov.uk/wp-content/uploads/2013/04/Advice-note-12v2.pdf>

<i>Criteria and Relevant Considerations</i>	<i>Commentary with Regard to Proposed Scheme</i>
<p>Extent</p> <ul style="list-style-type: none"> • What is the likely extent of the impact (geographical area and size of the affected population)? 	<p>The only potential transboundary environmental impact which is considered likely is from greenhouse gas emissions, which are known to contribute to changes on climate on a global scale.</p>
<p>Magnitude</p> <ul style="list-style-type: none"> • What will the likely magnitude of the change in relevant variables relative to the status quo, taking into account the sensitivity of the variable? 	<p>The impact of GHG emissions is considered irreversible within human lifetimes, however as above, the emissions are expected to be minimal during construction and decommissioning (in the order of 1 to 3 years) and is expected to lead to a beneficial contribution to UK GHG emissions during operation (assumed to be 40 years). The temporal pattern of GHG emissions is likely to be relatively constant during the construction and decommissioning phases.</p>
<p>Probability</p> <ul style="list-style-type: none"> • What is the degree of probability of the impact? • Is the impact likely to occur as a consequence of normal conditions or exceptional situations, such as accidents? 	<p>It is proposed to calculate the likely greenhouse gas emissions as part of the EIA. Greenhouse gas impacts will be put into context in terms of their impact on the UK's 5 year carbon budgets which set legally binding targets for greenhouse gas emissions. The greenhouse gas emissions offset through the production of cleaner electricity during the operational phase will be accounted for within the greenhouse gas emissions calculations.</p>
<p>Duration</p> <ul style="list-style-type: none"> • Is the impact likely to be temporary, short-term or long-term? • Is the impact likely to relate to the construction, operation or decommissioning phase of the activity? 	<p>In any event, the receptor for GHG emissions is the global atmosphere rather than individual countries, and it is not currently possible to determine if GHG emissions would change atmospheric processes or affect a particular country or state. There is therefore no potential for significant effects on the environment of any EEA State or group of EEA States resulting from GHG emissions from the Scheme. The assessment will present the GHG emissions and compare them with the UK national emissions inventory; transboundary effects from GHG emissions will not be considered further in the EIA.</p>
<p>Frequency</p> <ul style="list-style-type: none"> • What is likely to be the temporal pattern of the impact? 	
<p>Reversibility</p> <ul style="list-style-type: none"> • Is the impact likely to be reversible or irreversible? 	
<p>Cumulative impacts</p> <ul style="list-style-type: none"> • Are other major developments close by? 	<p>Proposed developments within 10km of the Scheme will be taken into consideration in the Environmental Impact Assessment (EIA). However, it is not anticipated that there is potential for significant cumulative transboundary effects.</p>

Appendix B – Initial Viewpoint Photographs



Viewpoint 1: B1506, The Limekilns



Viewpoint 2: Public Right of Way, southeast of Snailwell



Viewpoint 3: La Hogue Road, adjacent to Chippenham Hall Registered Park and Garden



Viewpoint 4: Norwich Road, A11 junction at Waterhall Farm

NB: following further analysis after the initial site visit, the proposed location of Viewpoint 4 is to the south of the photograph above



Viewpoint 5: Public Right of Way, Elms Road, Freckenham



Viewpoint 6: B1102, Freckenham Road, Worlington



Viewpoint 7: Public Right of Way, Mortimer Lane, Freckenham



Viewpoint 8: Bay Farm, Newmarket Road



Viewpoint 9: Public Right of Way, River Lark, West Row

NB: the photograph above is taken from the road next to the Public Right of Way.



Viewpoint 10: Golf Links Road, at Royal Worlington and Newmarket Golf Course



Viewpoint 11: Snailwell Road, east of junction with A142



Viewpoint 12: Chippenham Road, east of Snailwell



Viewpoint 13: Public Right of Way, east side of Snailwell

Appendix C – Long List of Major Accidents or Disasters

	Major accident or disaster	Relevant for long list?	Why? (note if risk to the project, or project exacerbates risk)	Potential Receptors	Covered already in proposed ES? If so, where?
1	Geological disasters				
1.1	Landslides	No	The risk of landslides will be considered as part of the geotechnical design, ensuring that the risk is designed out, both in terms of the vulnerability of the Scheme to these types of event; however given the flat nature of the land this risk is considered minimal. The Scheme is not anticipated to increase the risk of landslip happening onsite or elsewhere; it will not significantly change the erosion potential of the soil or stability of the land.	N/A	N/A
1.2	Earthquakes	No	The Scheme is not located in a geologically active area and as such earthquakes are not considered to be a real risk or serious possibility.	N/A	N/A
1.3	Sinkholes	No	The risk of sinkholes will be considered as part of the geotechnical design, ensuring that the risk is designed out, both in terms of the vulnerability of the Scheme to these types of event, and also in terms of the potential for the Scheme to increase the risk of such an event happening.	N/A	N/A
2	Hydrological disasters				
2.1	Floods	Yes	Both the vulnerability of the Scheme to flooding, and its potential to exacerbate flooding, will be covered in the Flood Risk Assessment, and also reported in the ES (both in terms of the risk to the Scheme and increased risk caused by the Scheme).	Property and people in areas of increased flood risk.	Chapter 8: Flood Risk, Drainage and Surface Water (including Flood Risk Assessment). Mitigation will be considered and, where necessary, incorporated into the Scheme design.
2.2	Limnic eruptions	No	Not applicable as there are no lakes nearby.	N/A	N/A
2.3	Tsunami/Storm surge	No	Not applicable as the Scheme is not in a coastal location.	N/A	N/A
3	Meteorological disasters				
3.1	Blizzards	No	The Scheme is considered to be no more vulnerable than any other development.	N/A	N/A
3.2	Cyclonic storms	No	Although there are storms in the UK, their destructive force tends to be much less than in other parts of the world and the Scheme is not particularly vulnerable to any potential effects.	N/A	N/A
3.3	Droughts	No	Droughts are only considered as a disaster due to water shortages for essential services and where there are indirect impacts on food production, loss of soils etc. The Scheme is not considered to be vulnerable to drought.	N/A	N/A
3.4	Thunderstorms	No	As the Scheme includes metal components, there is a risk of lightning strikes. However, these risks will be removed or reduced through inbuilt control systems and can be scoped out at this stage.	N/A	N/A
3.5	Hailstorms	No	The Scheme is considered to be no more vulnerable than any other development.	N/A	N/A
3.6	Heat waves	No	While impacts are expected as a result of projected temperature increases (due to climate change), these temperature increases are not expected to have a significant impact on the Scheme. It is anticipated that the cooling systems for the battery energy storage systems, will regulate temperatures to within safe conditions.	N/A	No
3.7	Tornadoes	No	Although there are tornadoes in the UK, their destructive force tends to be much less than in other parts of the world and the Scheme is not particularly vulnerable to any potential effects.	N/A	No
3.8	Fires	Yes	There may be some potential for fire as a result of the battery storage element of the Scheme. However, the battery energy storage system will include cooling systems, which are designed to regulate temperatures to within safe conditions to minimise the risk of fire. In addition, the Scheme design will include adequate separation between battery banks to ensure that an isolated fire would not become widespread and lead to a major incident. Fire detection and suppression features could be installed to detect (e.g. multispectrum infrared flame detectors) and suppress fire (e.g. water base suppression systems) to minimise the effect of any fire.	Local residents, habitats and species.	Chapter 2: The Scheme

	<i>Major accident or disaster</i>	<i>Relevant for long list?</i>	<i>Why? (note if risk to the project, or project exacerbates risk)</i>	<i>Potential Receptors</i>	<i>Covered already in proposed ES? If so, where?</i>
3.9	Air Quality Events	No	The Scheme is not located within any Air Quality Management Areas (AQMA). The nearest AQMA is in Newmarket, approximately 3km to the south west of the Sunnica West Site. This AQMA will not be affected by the Scheme. Although there are likely to be emissions during construction and decommissioning of the Scheme, it is considered that these can be managed through the implementation of a Construction Environmental Management Plan. Good practice measures will be set out in a Framework Construction Environmental Management Plan to be appended to the ES.	N/A	N/A
4	Transport				
4.1	Road Accidents	Yes	The risk posed by spillage from hazardous loads as a result of a road traffic accident during construction or decommissioning will be considered in the Flood Risk, Drainage and Water Resources chapter of the ES. The potential for glint and glare to affect road users will be considered within a technical appendix to the ES if any risks are identified.	Aquatic environment Road users	Chapter 8: Flood Risk, Drainage and Surface Water Glint and Glare Study Mitigation will be considered and, where necessary, incorporated into the Scheme design.
4.2	Rail Accidents	Yes	The cable route corridor for Grid Connection Route B crosses the railway line connecting Newmarket to Ely. The crossing will be designed to meet the specific requirements of Network Rail and therefore the risk of a rail accident as a result of the crossing will be minimised. An Approval in Principle Report for the preferred crossing option will be completed in accordance with Network Rail's current guidelines 'NR/L2/CIV/003 Level 2 Engineering Assurance of Building and Civil Engineering Works'.	Rail users	No
4.3	Aircraft Disasters	Yes	The potential for glint and glare to affect aircraft will be considered within a technical appendix to the ES if any risks are identified.	Pilots and aircraft	Glint and Glare Study Mitigation will be considered and, where necessary, incorporated into the Scheme design.
5	Engineering Accidents/Failures				
5.1	Bridge Failure	No	Not applicable as no bridges used or constructed as part of Scheme.	N/A	N/A
5.2	Tunnel Failure or Fire	No	None nearby	N/A	N/A
5.3	Dam Failure	No	Neither the Sunnica East nor Sunnica West Sites are located within or near any registered reservoirs (assumed with volumes >10,000m3). The Sites are therefore at very low risk of flooding from reservoirs.	N/A	N/A
5.4	Flood Defence Failure	Yes	This will be covered in the Flood Risk Assessment and will also be reported in ES, both in terms of the risk to the Scheme and increased risk caused by the Scheme.	Property and people in areas of increased flood risk.	Chapter 8: Flood Risk, Drainage and Surface Water (including Flood Risk Assessment). Mitigation will be considered and, where necessary, incorporated into the Scheme design.
5.5	Mast and Tower Collapse	No	Not applicable as there are no masts or towers nearby.	N/A	N/A
5.6	Building failure or fire	No	No buildings close enough to the Scheme for it to be affected by building failure or fire.	N/A	N/A
5.7	Utilities failure (gas, electricity, water, sewage, oil, communications)	Yes	The Scheme has the potential to affect existing utility infrastructure below ground. To identify any existing infrastructure constraints, both consultation and a desk based study will be undertaken. It is known that there is a high pressure gas main, which the cable route crosses, and is located within the Sunnica East Site.	Employees and local residents	No, however, consultation with relevant utilities providers is a routine part of solar development and consultees will include water, gas and electricity utilities providers and telecommunications providers as appropriate. Information obtained from consultation will be used to inform the layout design.
6	Industrial Accidents				
6.1	Defence industry	No	Not applicable as there is no defence manufacturing nearby.	N/A	N/A

	<i>Major accident or disaster</i>	<i>Relevant for long list?</i>	<i>Why? (note if risk to the project, or project exacerbates risk)</i>	<i>Potential Receptors</i>	<i>Covered already in proposed ES? If so, where?</i>
6.2	Energy Industry (fossil fuel)	No	There is an anaerobic digestion plant located in close proximity to the Sunnica East Site. The risk of an industrial accident from this plant affecting the Scheme is minimal due to the separation distance.	N/A	N/A
6.3	Nuclear Power	No	Not applicable as there are no nuclear power stations nearby.	N/A	N/A
6.4	Oil and gas refinery/storage	No	Not applicable as there is no relevant industry nearby.	N/A	N/A
6.5	Food Industry	No	Not applicable as there is no relevant industry nearby.	N/A	N/A
6.6	Chemical Industry	No	Not applicable as there no relevant industry nearby.	N/A	N/A
6.7	Manufacturing Industry	No	Not applicable as there no relevant industry nearby.	N/A	N/A
6.8	Mining / Extractive Industry	No	There is the potential for current or past quarrying activity in the vicinity to lead to unstable ground conditions, particularly on the Sunnica East Site due to the active quarry on-site. However, the risk will be considered as part of the geotechnical design, ensuring that the risk is designed out.	N/A	N/A
7	Terrorism/Crime/Civil unrest	No	The Scheme is unlikely to be more of a target for these types of incident due to its rural location and low number of exposed targets.	N/A	N/A
8	War	No	The Scheme is no more vulnerable than any other infrastructure.	N/A	N/A
9	Disease				
9.1	Human disease	No	The Scheme is no more vulnerable than any other infrastructure.	N/A	N/A
9.2	Animal disease	No	The Scheme is no more vulnerable than any other infrastructure.	N/A	N/A
9.3	Plant disease	Yes	New planting may be susceptible to biosecurity issues, such as the increased prevalence of pests and diseases, due to climate change.	Habitats and species	Chapter 9: Landscape and Visual Amenity (including Biodiversity and Landscape Management Plan) The planting design will take account of biosecurity risks through a wider mix of species including some non-natives.

Figures

Figure 1-2: Scheme Boundary

Figure 2-1: (a-d): Environmental Constraints

Figure 7-1: Cultural Heritage Study Area

Figure 7-2: Designated Heritage Assets within the 5km Study Area

Figure 7-3: Archaeological Assets within the 1km Study Area

Figure 7-4: Built Heritage Assets within the 1km Study Area

Figure 8-1: Statutory Nature Conservation Sites

Figure 8-2: Non-Statutory Nature Conservation Sites

Figure 9-1: Surface Water Bodies and their Attributes

Figure 9-2: Groundwater Features

Figure 10-1: Zone of Theoretical Visibility – Bare Ground

Figure 10-2: Zone of Theoretical Visibility – Screened

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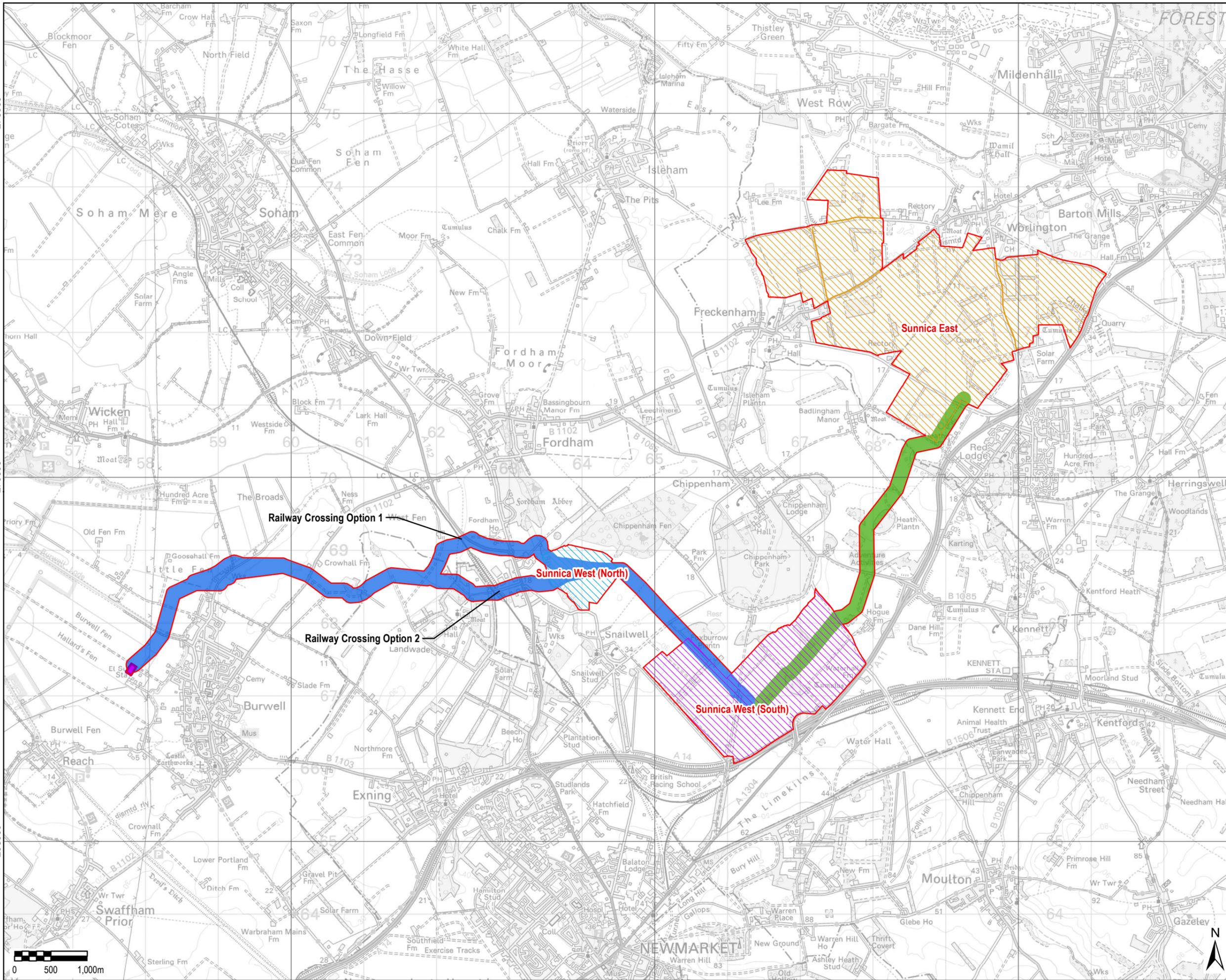
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- LEGEND**
- Scheme Boundary for the purposes of scoping
 - Maximum area for Sunnica East Site
 - Maximum area for Sunnica West Site (North)
 - Maximum area for Sunnica West Site (South)
- Associated Development**
- National Grid Substation Extension
 - Maximum corridor for Grid Connection Route A
 - Maximum corridor for Grid Connection Route B

NOTE: Public highways run through the Sunnica East Site, which are not part of the site boundary. These have been digitised based on the 1:1250 scale OS Mastermap.

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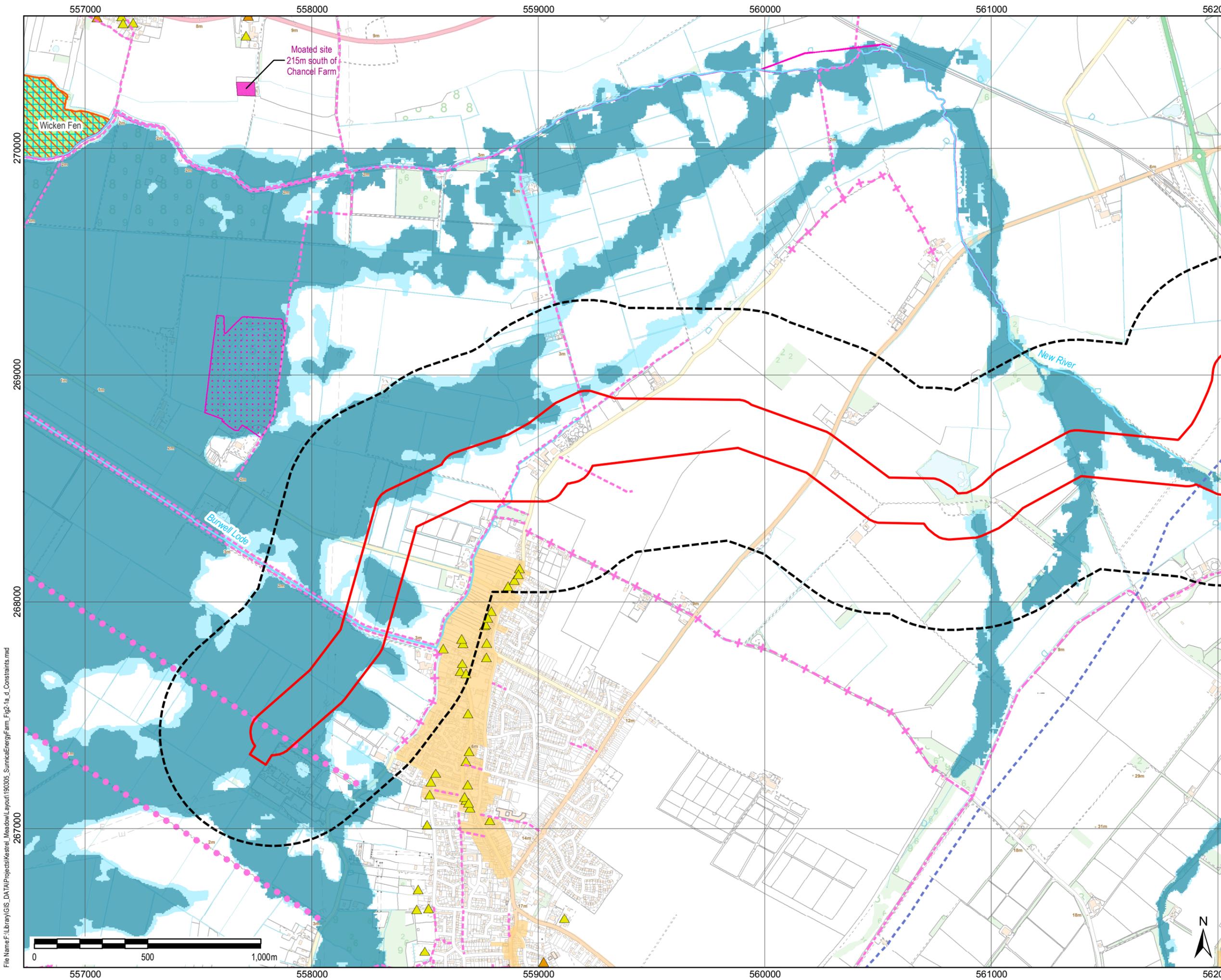
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- Other route with public access
- High Pressure Gas Main
- River
- Flood Zone 2
- Flood Zone 3
- Ramsar
- Site of Special Scientific Interest
- Special Areas for Conservation
- National Nature Reserve
- County Wildlife Site
- Scheduled Monument
- Conservation Area
- Listed Building - Grade**
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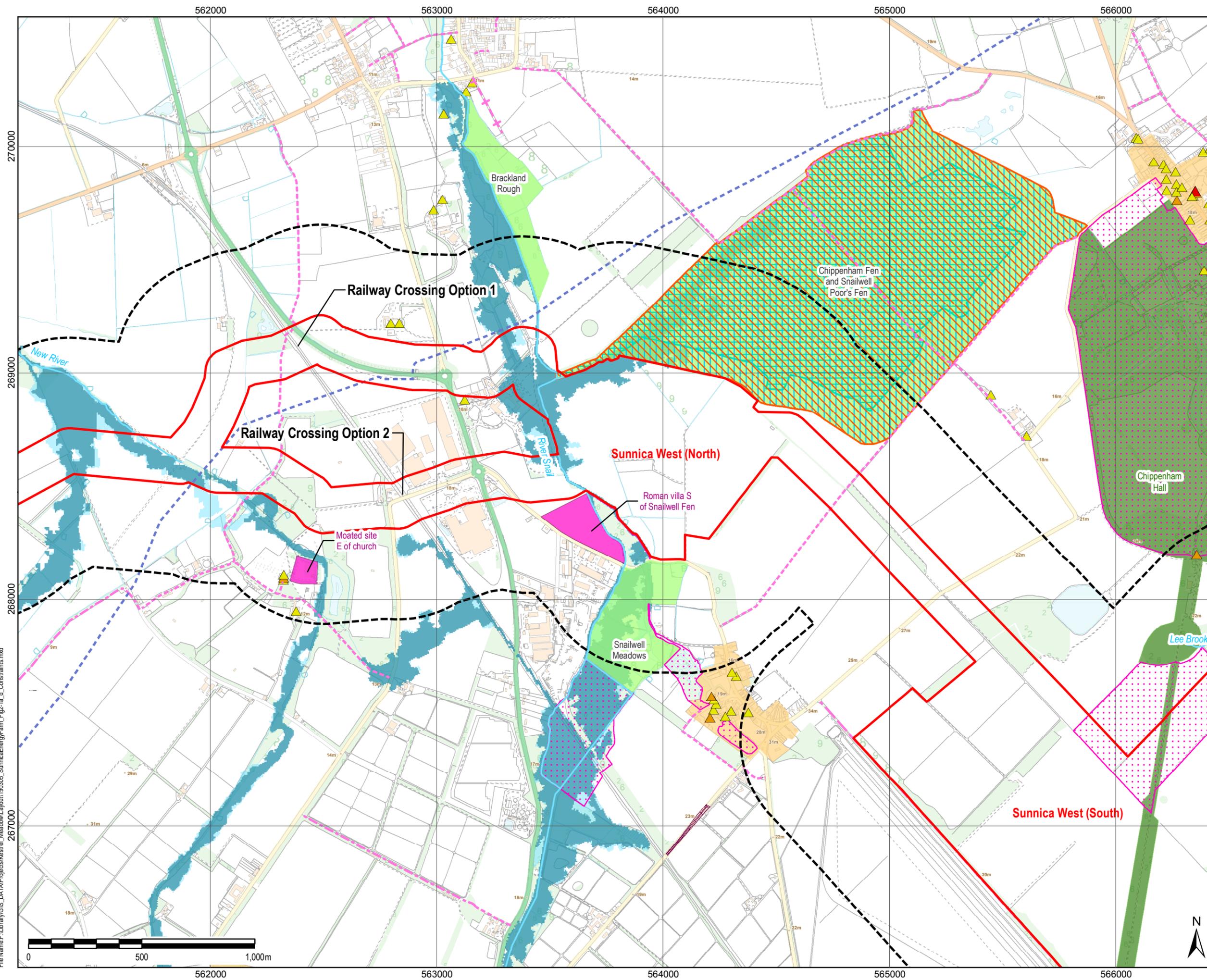
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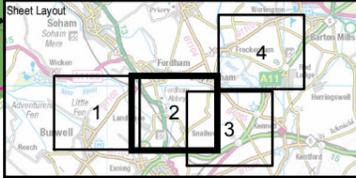
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 - Special Areas for Conservation
 - National Nature Reserve
 - County Wildlife Site
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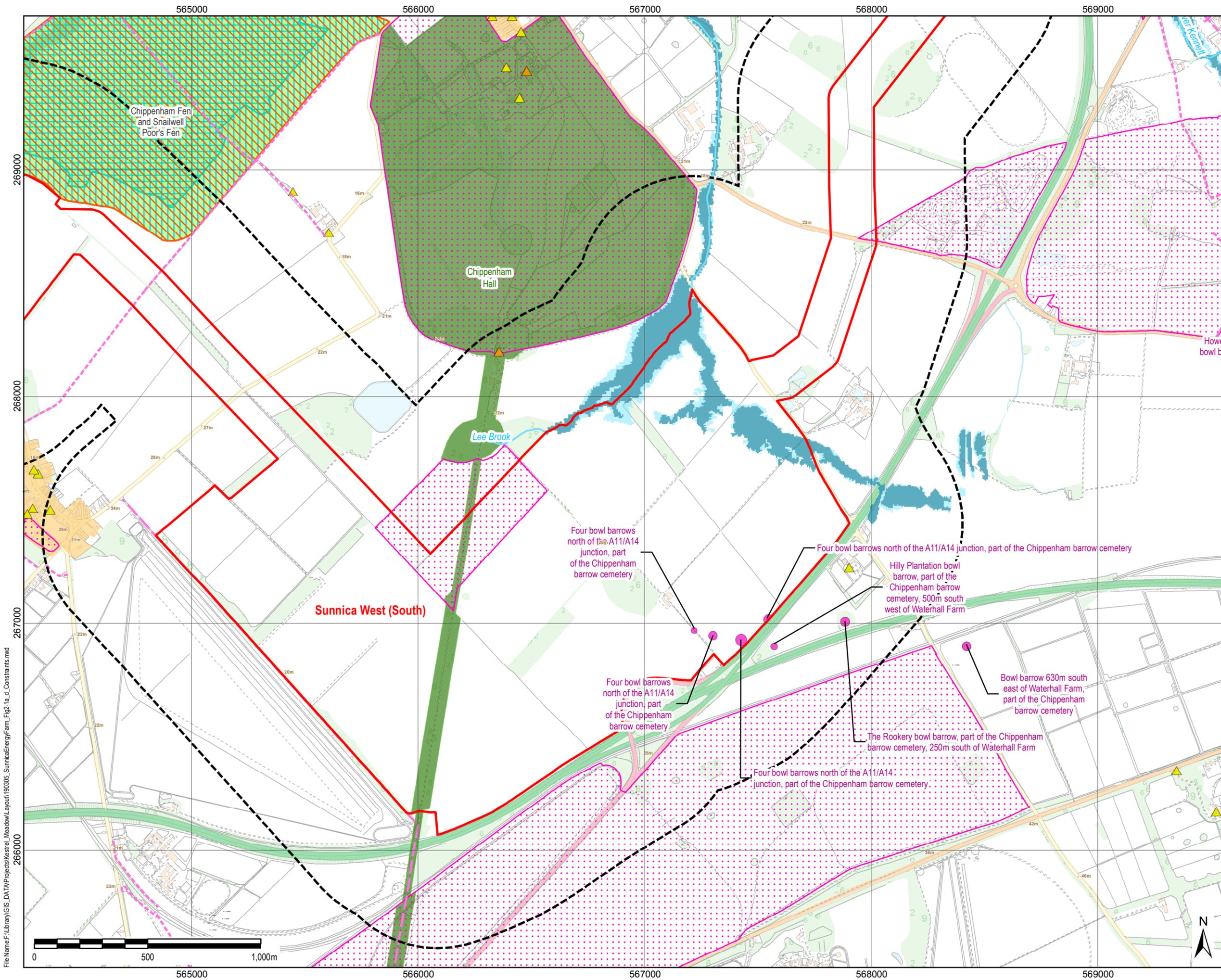
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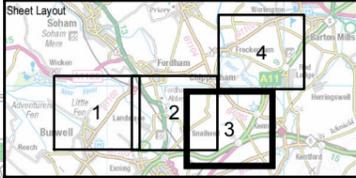
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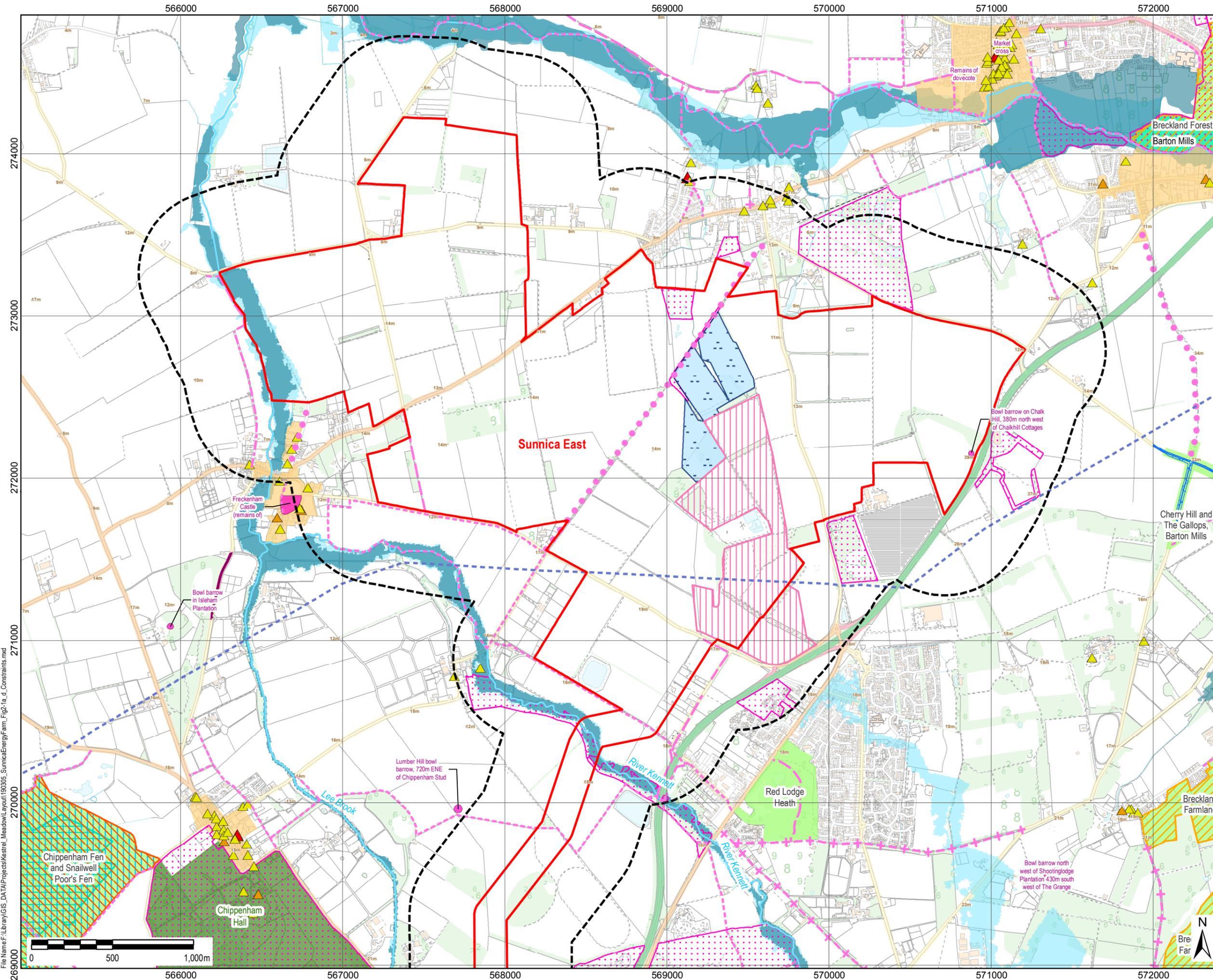
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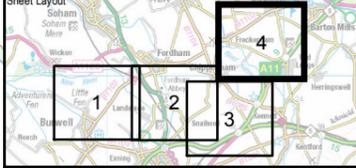
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 - Bridleway
 - Other route with public access
 - Path
 - High Pressure Gas Main
 - River
 - Flood Zone 2
 - Flood Zone 3
 - Worlington Quarry Existing Site
 - Worlington Quarry Proposed Extension
 - Ramsar
 - Site of Special Scientific Interest
 - Special Protection Area
 - Special Areas for Conservation
 - National Nature Reserve
 - Local Nature Reserve
 - County Wildlife Site
 - Roadside Nature Reserve
 - Protected Road Verge
 - Parks and Gardens
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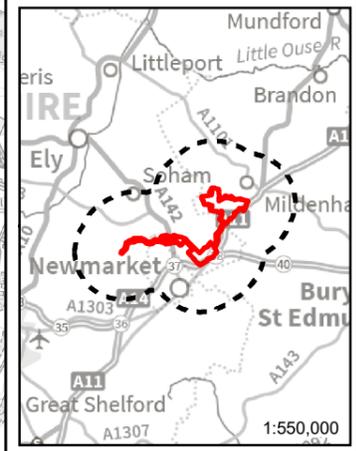
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LEGEND

- 1km study area
- 5km study area
- Scheme Boundary for the purposes of scoping



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Purpose of issue EIA SCOPING

Client SUNNICA LTD.



Drawing Title CULTURAL HERITAGE STUDY AREA

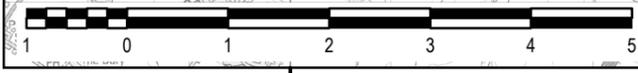
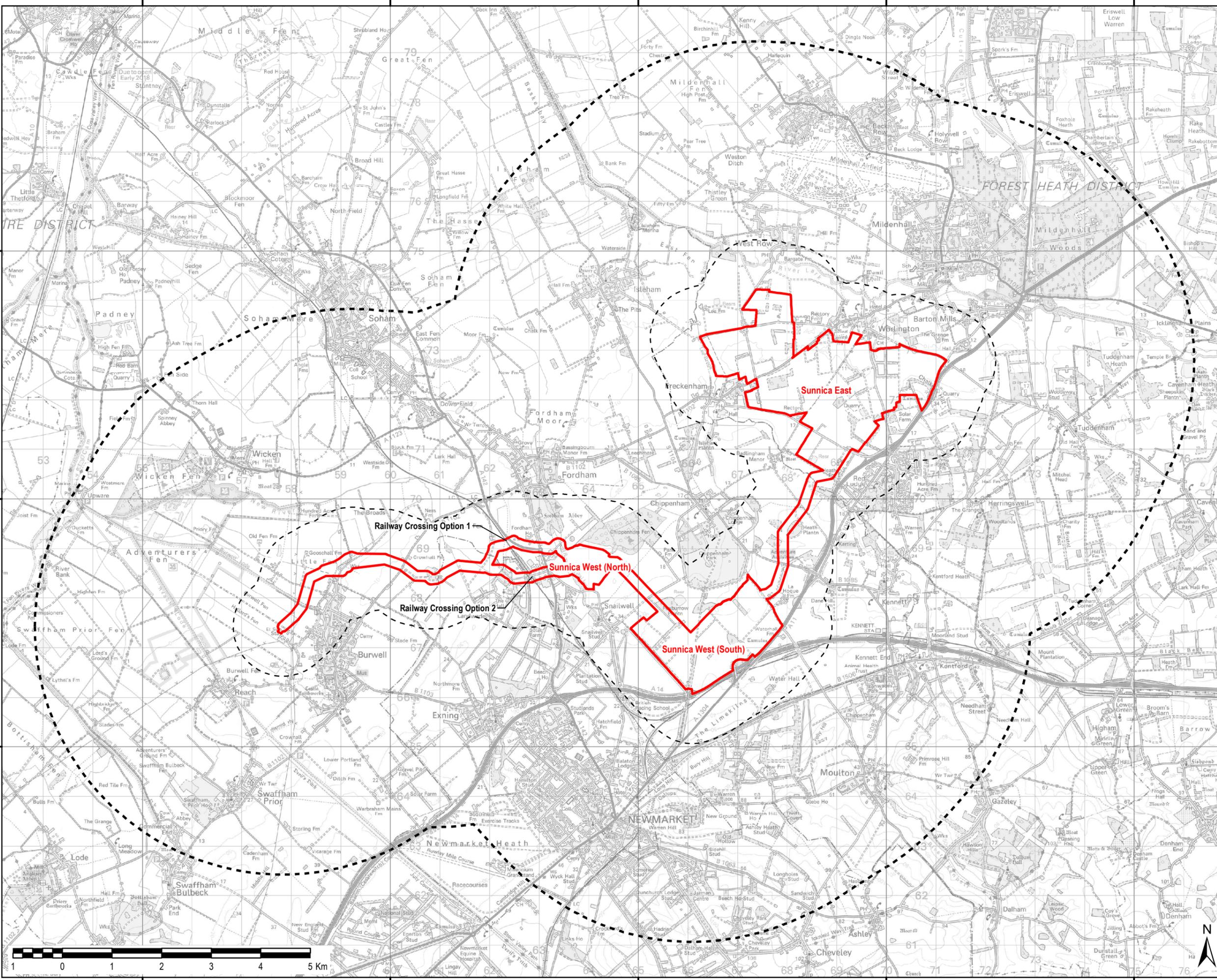
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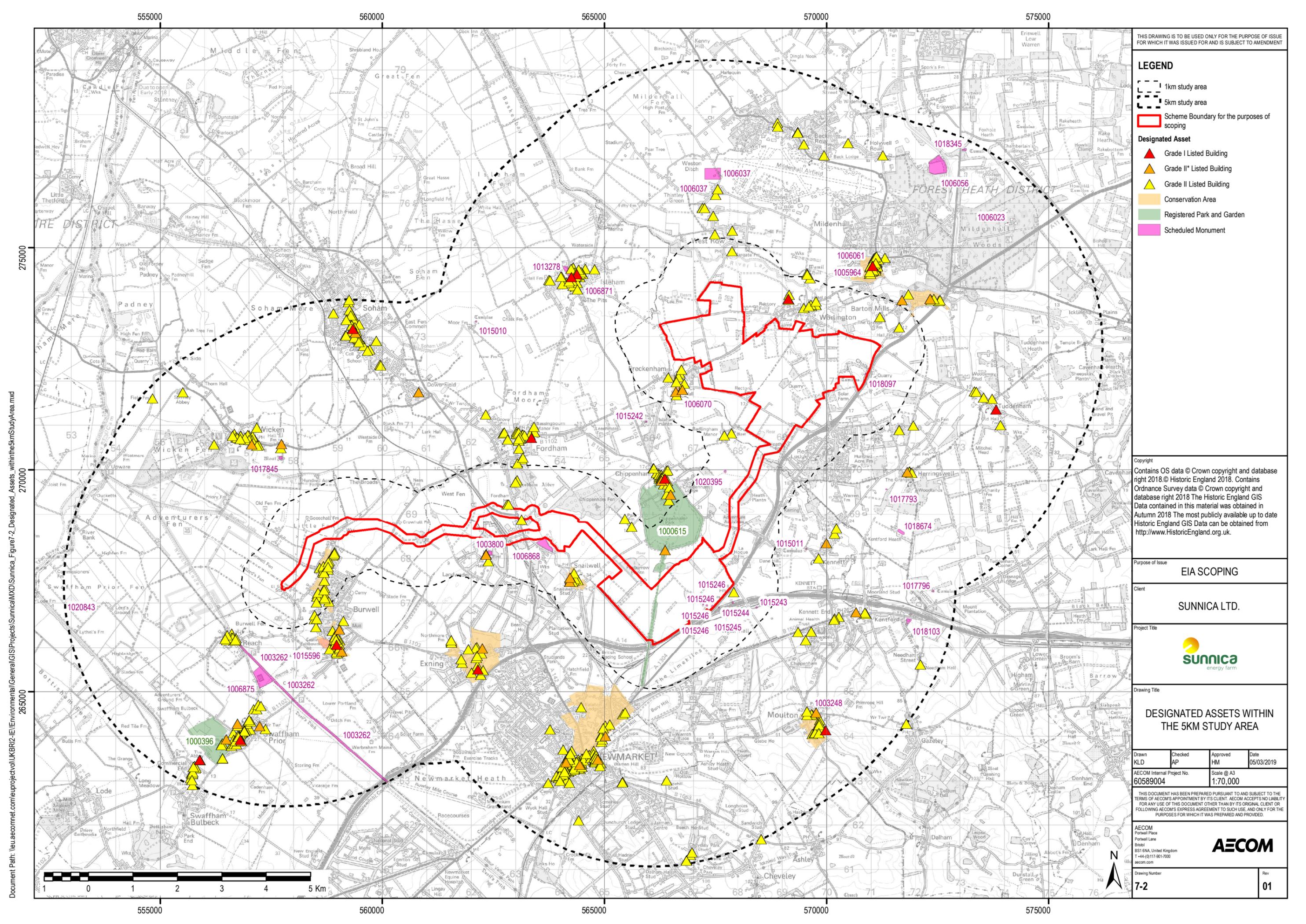
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LEGEND

- 1km study area
- 5km study area
- Scheme Boundary for the purposes of scoping

Designated Asset

- Grade I Listed Building
- Grade II* Listed Building
- Grade II Listed Building
- Conservation Area
- Registered Park and Garden
- Scheduled Monument

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Purpose of Issue
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Client
SUNNICA LTD.

Project Title

Drawing Title
DESIGNATED ASSETS WITHIN THE 5KM STUDY AREA

Drawn KLD	Checked AP	Approved HM	Date 05/03/2019
AECOM Internal Project No. 60589004		Scale @ A3 1:70,000	

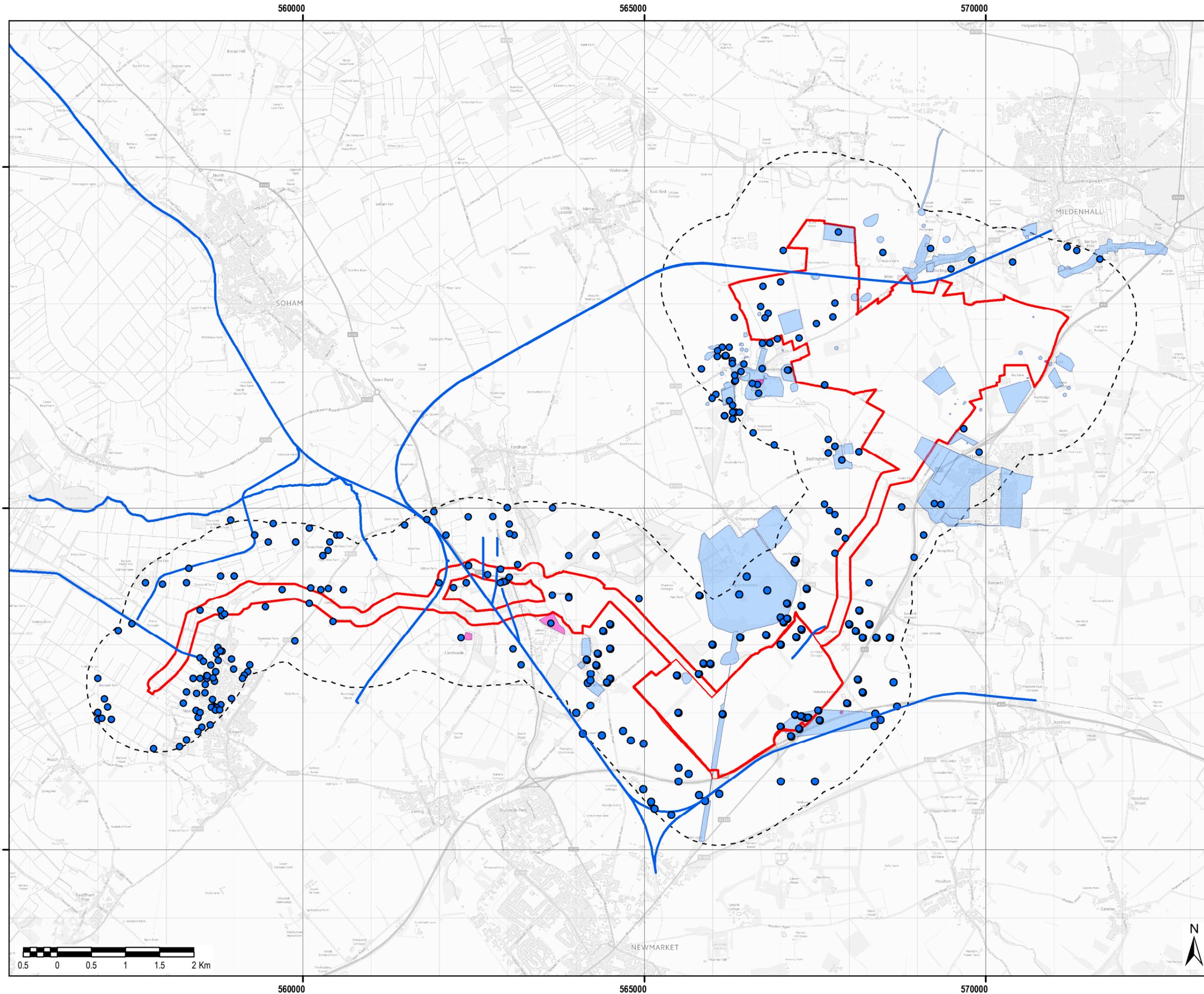
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LEGEND

- 1km study area
- Scheme Boundary for the purposes of scoping
- Archaeological Asset**
- HER Monument - Point
- HER Monument - Linear
- HER Monument - Area
- Scheduled Monument

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Client **SUNNICA LTD.**



Drawing Title
ARCHAEOLOGICAL ASSETS WITHIN THE 1KM STUDY AREA

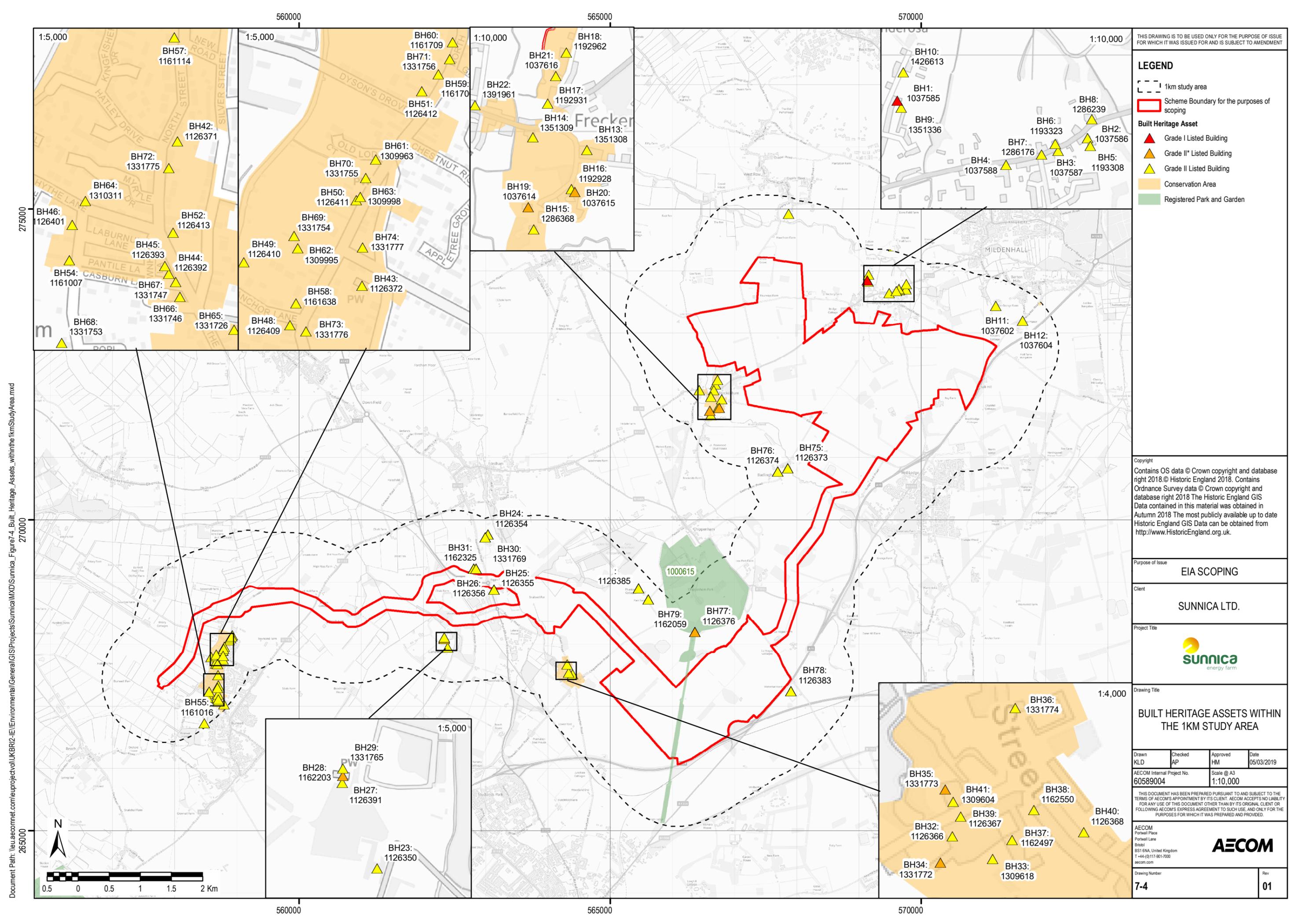
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LEGEND

- 1km study area
- Scheme Boundary for the purposes of scoping
- Built Heritage Asset**
 - Grade I Listed Building
 - Grade II* Listed Building
 - Grade II Listed Building
 - Conservation Area
 - Registered Park and Garden

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Purpose of Issue
EIA SCOPING

Client
SUNNICA LTD.



Drawing Title
BUILT HERITAGE ASSETS WITHIN THE 1KM STUDY AREA

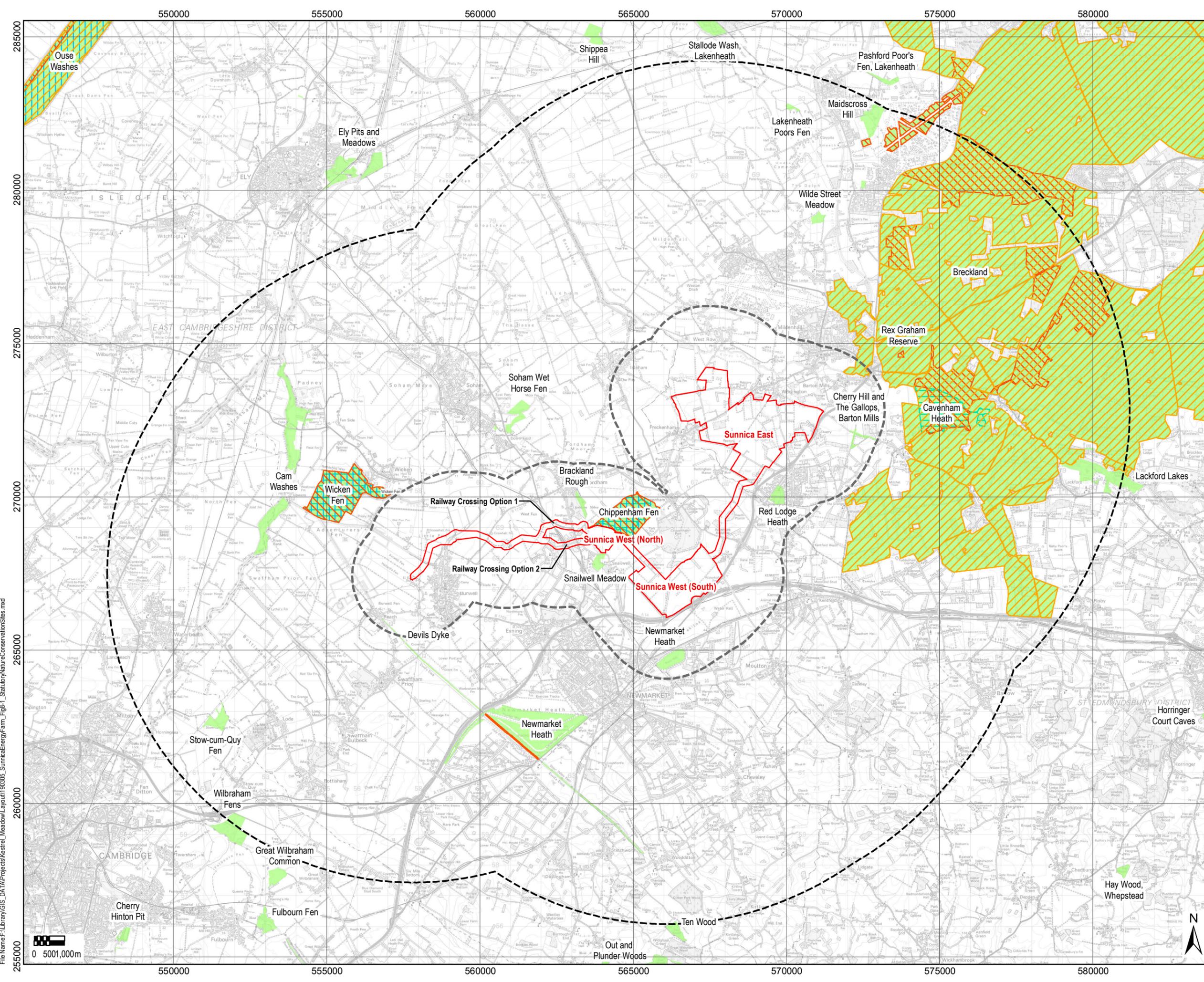
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- LEGEND**
- Scheme Boundary for the purposes of scoping
 - 2km Scheme Buffer
 - 10km Scheme Buffer
 - Statutory Nature Conservation Site**
 - Ramsar
 - Special Protection Area
 - Special Area of Conservation
 - Site of Special Scientific Interest
 - National Nature Reserve

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Purpose of Issue **EIA SCOPING**

Client **SUNNICA LTD**



Drawing Title **STATUTORY NATURE CONSERVATION SITES**

Drawn AD	Checked NG	Approved CLB	Date 05/03/2019
AECOM Internal Project No. 60589004		Scale @ A3 1:110,000	

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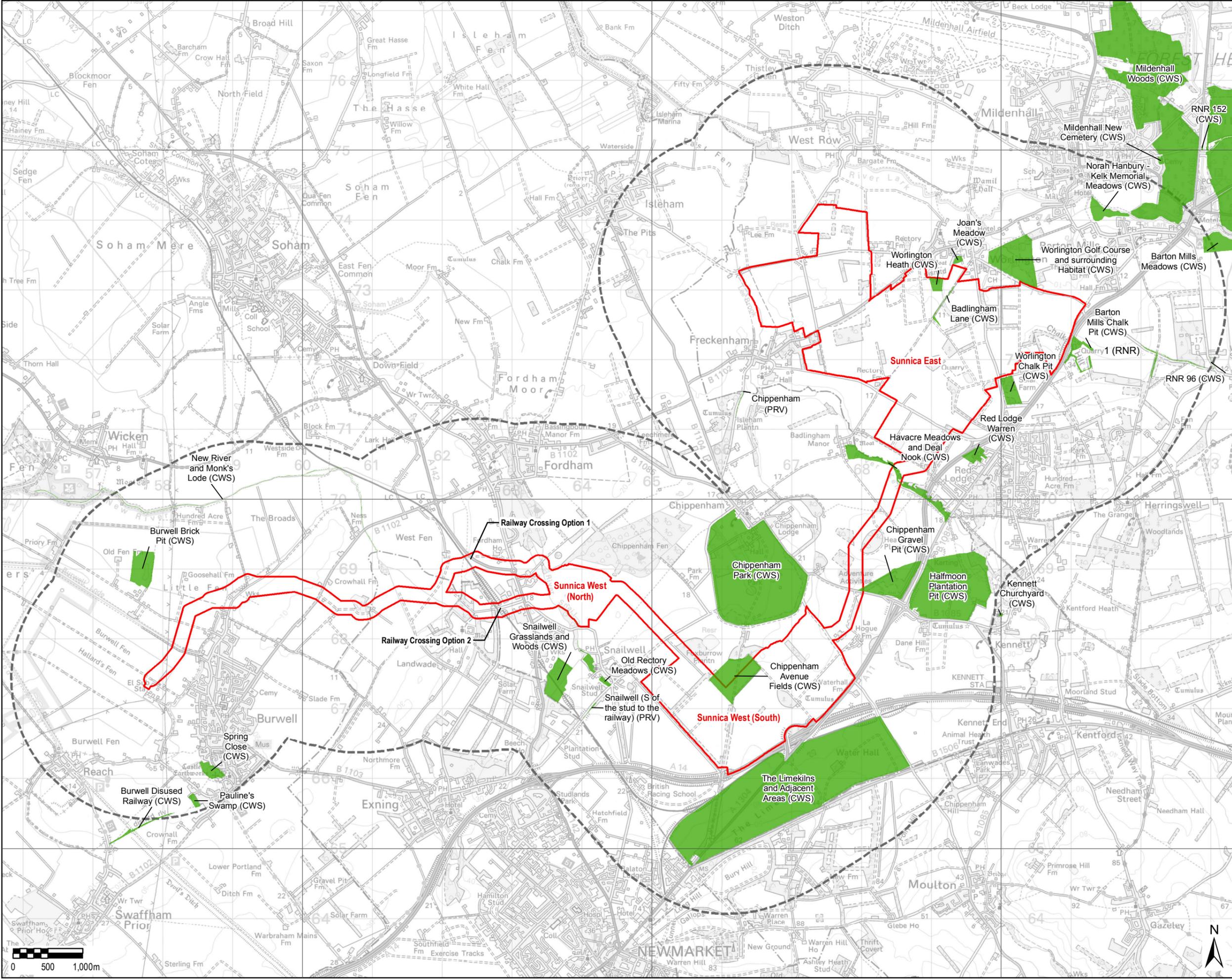
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- LEGEND**
- Scheme Boundary for the purposes of scoping
 - 2km Scheme Buffer
 - County Wildlife Site (CWS)
 - Protected Road Verge (PRV)
 - Roadside Nature Reserve (RNR)



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Client: SUNNICA LTD



NON-STATUTORY NATURE CONSERVATION SITES

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AECOM Internal Project No: 60589004		Scale @ A3: 1:50,000	

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Drawing Number: 8-2	Rev: 0
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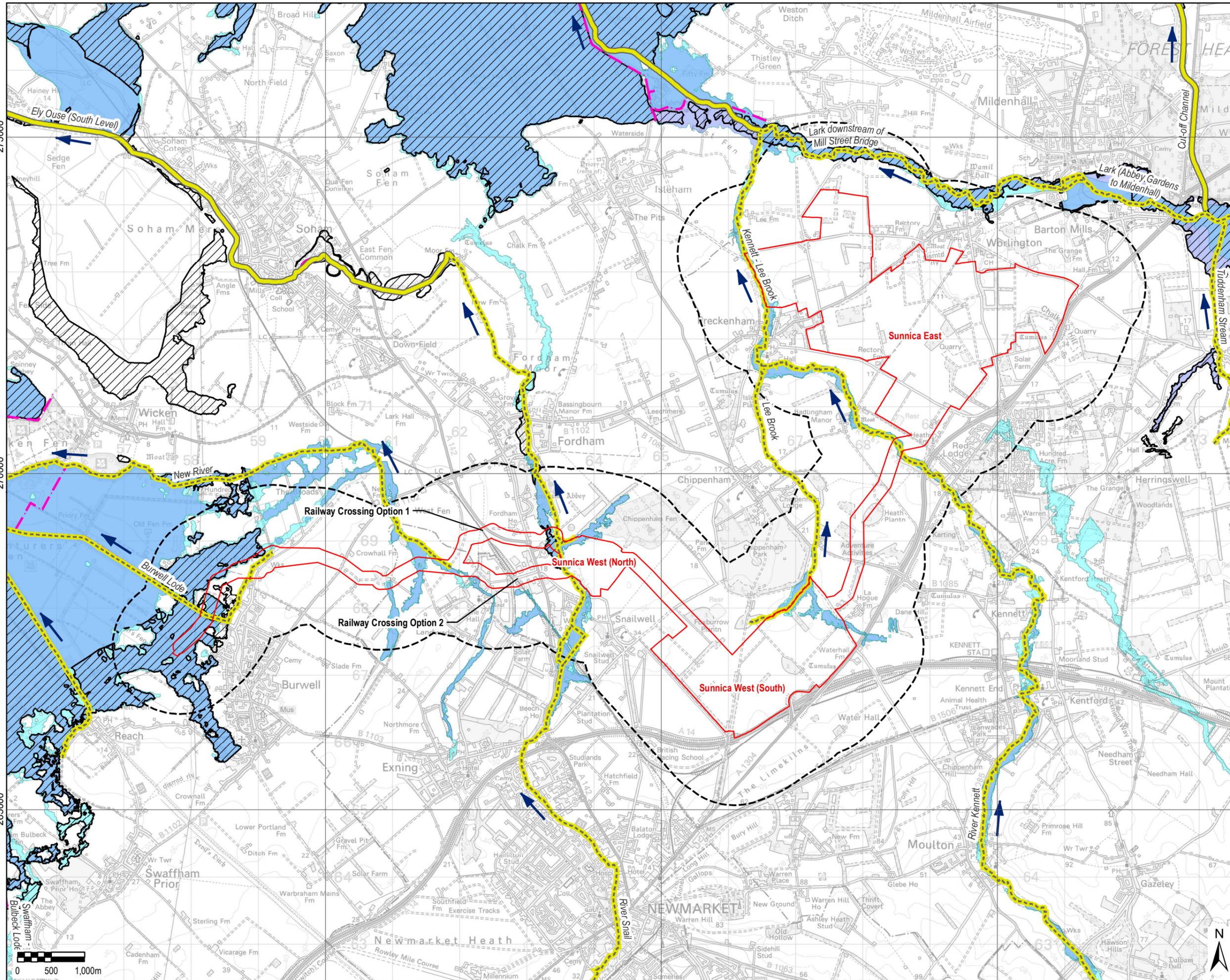
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- LEGEND**
- Scheme Boundary for the purposes of scoping
 - 1km Scheme Buffer
 - Flood Defences
 - Flood Zone 2
 - Flood Zone 3
 - Areas Benefiting from Flood Defences
 - River Flow Direction
- WFD Status and Hydromorphological Designation**
- Moderate, Artificial
 - Moderate, Heavily Modified

NOTES:

- a. Ponds and small lakes are not shown at this scale
- b. Please see Figure 2-1 for nature conservation sites
- c. Entire study area is within a Surface Water Nitrate Vulnerable Zone
- d. No Surface Water Drinking Water Safeguard Zones in the study area
- e. Study area is within a Surface Water Drinking Water Protected Area

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Purpose of Issue: **EIA SCOPING**

Client: **SUNNICA LTD**



Drawing Title: **SURFACE WATER BODIES AND THEIR ATTRIBUTES**

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Drawing Number 9-1	Rev 0
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LEGEND

- Scheme Boundary for the purposes of scoping
- 1km Scheme Buffer
- River
- Groundwater Nitrate Vulnerable Zone
- Groundwater WFD Body
- Poor Status
- Source Protection Zones**
- Zone I - Inner Protection Zone
- Zone II - Outer Protection Zone
- Zone III - Total Catchment

NOTES:

- a. Ponds and small lakes are not shown at this scale
- b. Please see Figure 2-1 for nature conservation sites
- c. No Groundwater Water Drinking Water Safeguard Zones in the study area

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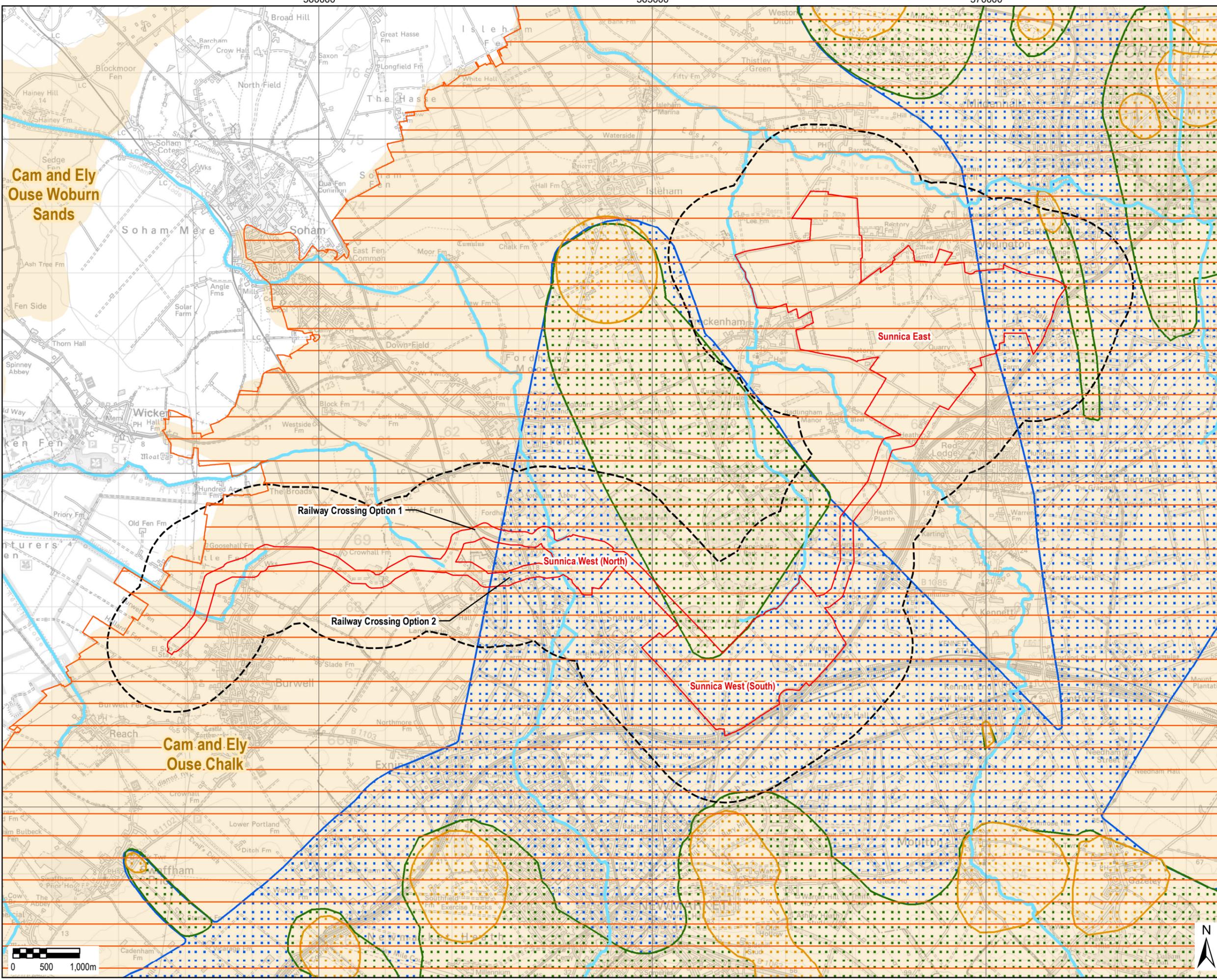
Drawing Title **GROUNDWATER FEATURES**

Drawn AH	Checked AD	Approved CLB	Date 05/03/2019
AECOM Internal Project No. 60589004		Scale @ A3 1:52,000	

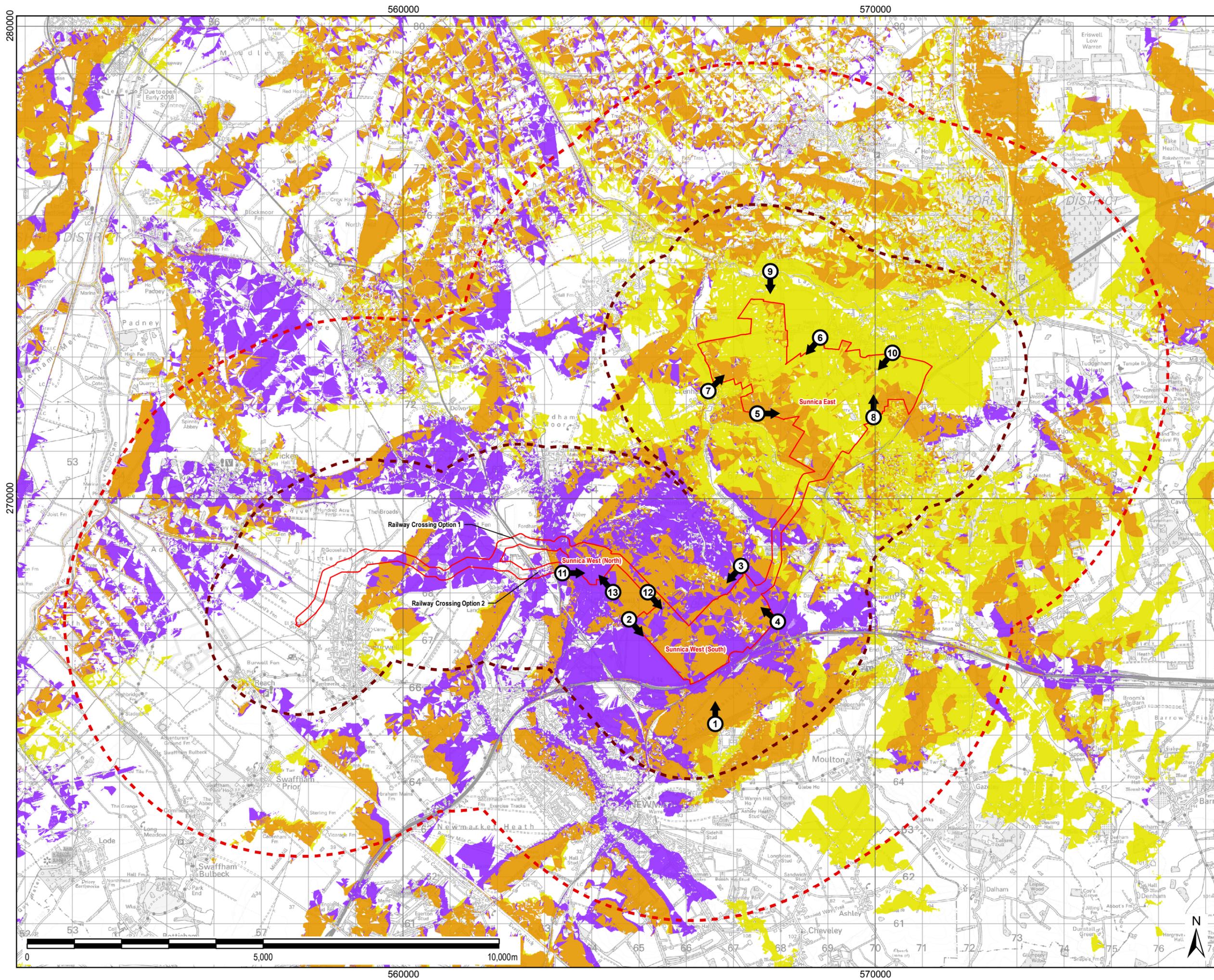
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LEGEND

- Scheme Boundary for the purposes of scoping
- 2km Study Area
- 5km Study Area
- Viewpoint

Zone of Theoretical Visibility - Bare Ground

- Sunnica West Site Visible Only
- Sunnica East Site Visible Only
- Both Sites Visible

NOTES
 Generated using Ordnance Surveys Terrain 5 Dataset which is based on 5m resolution Digital Terrain Model (DTM), incorporating the proposed Solar PV panels modelled across the site to a maximum anticipated height of 5.5m, and the proposed substations, modelled to a maximum anticipated height of 10m.
 Proposed scheme is derived from the proposed Red Line Boundary (RLB) areas dated 06/02/2019 with reference points included every 20m on a grid across the full extent of the RLB site. The ZTVs do not include associated buildings which are not known at this stage. ZTV calculated using ArcGIS 10.5.1 Viewshed tool with observer eye height 2m above ground.

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Purpose of Issue: **EIA SCOPING**

Client: **SUNNICA LTD**

Project Title:

Drawing Title: **ZONE OF THEORETICAL VISIBILITY - BARE GROUND**

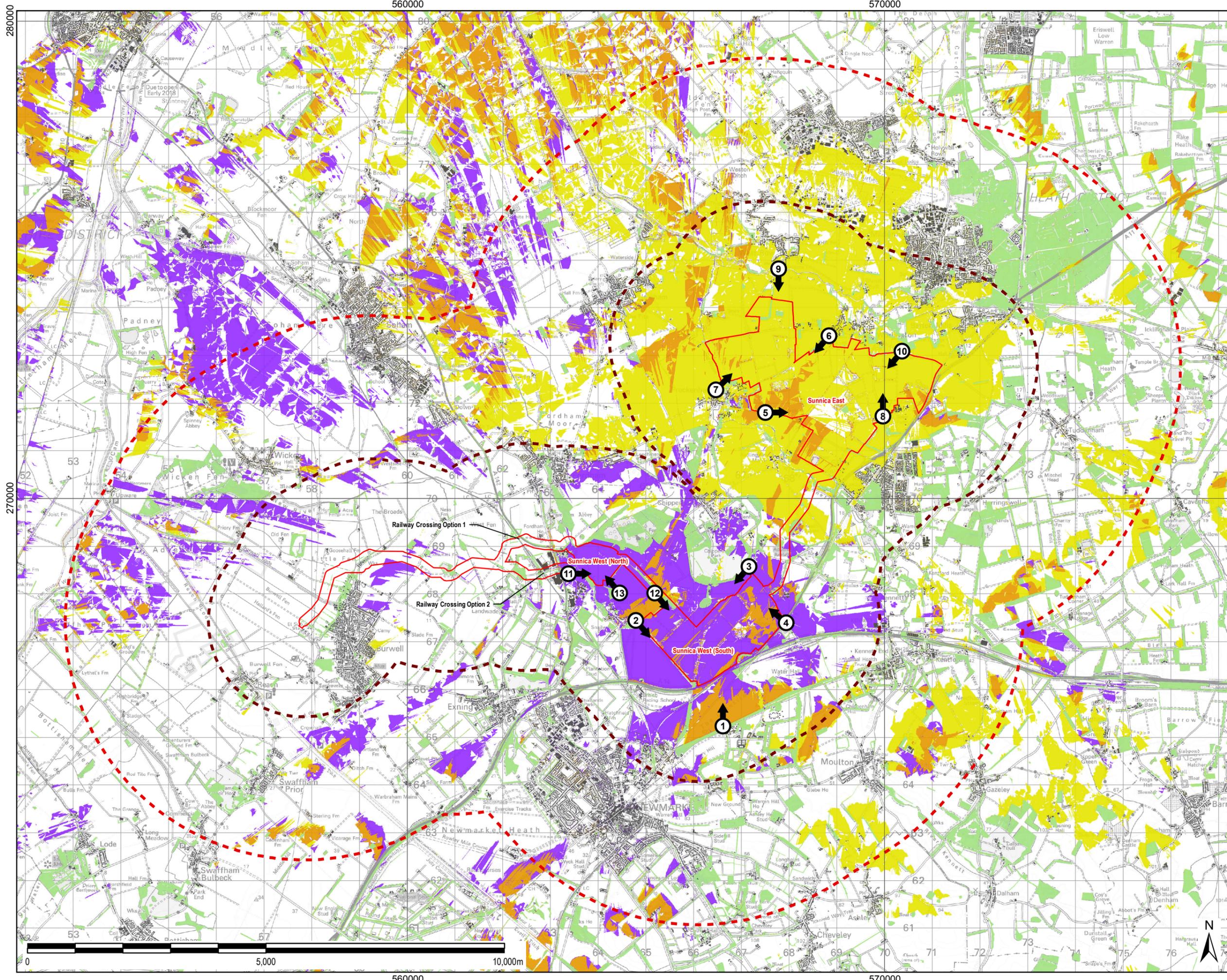
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LEGEND

- Scheme Boundary for the purposes of scoping
- 2km Study Area
- 5km Study Area
- Viewpoint

Screened Layers

- Building
- Woodland

Zone of Theoretical Visibility - Screened with Buildings and Woodland

- Sunnica West Site Visible Only
- Sunnica East Site Visible Only
- Both Sites Visible

NOTES

Generated using Ordnance Surveys Terrain 5 Dataset which is based on 5m resolution Digital Terrain Model (DTM), incorporating the proposed Solar PV panels modelled across the site to a maximum anticipated height of 3.5m, and the proposed substations, modelled to a maximum anticipated height of 10m. Proposed scheme is derived from the proposed Red Line Boundary (RLB) areas dated 06/02/2019 with reference points included every 20m on a grid across the full extent of the RLB site. The ZTVs do not include associated buildings which are not known at this stage. The ZTVs do not include associated buildings which are not known at this stage. The ZTVs do not include associated buildings which are not known at this stage.

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Purpose of Issue

EIA SCOPING

Client

SUNNICA LTD

Project Title

Drawing Title

ZONE OF THEORETICAL VISIBILITY - SCREENED

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