

Tillbridge Solar Project EN010142

Volume 7

**Framework Landscape and Ecological Management Plan
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Table of Contents

1.	Introduction	1
1.1	Background.....	1
1.2	The Scheme	2
	The Principal Site.....	2
	The Cable Route Corridor	4
2.	Purpose of this Document.....	4
3.	Landscape and Ecology Strategy	5
4.	Legislative and Policy Framework	7
4.1	Introduction	7
4.2	Legislation.....	7
4.3	Planning Policy	8
4.4	Other Biodiversity Guidance	8
4.5	Landscape Character Documents	9
	National Character Areas (NCA).....	10
	East Midlands Landscape Character Assessment.....	10
	West Lindsey Landscape Character Assessment.....	10
	Bassetlaw Landscape Character Assessment.....	11
	Neighbourhood Plan Supporting Documents.....	11
	Corringham Character Assessment	11
	Neighbourhood Character Profile for Glentworth	12
	Hemswell and Harpswell Character Assessment	12
	Rampton and Woodbeck Character Assessment (2018).....	12
	Sturton by Stow and Stow Neighbourhood Profile (2019)	12
	Treswell with Cottam Character Assessment (2018).....	12
4.6	Biodiversity Net Gain	12
5.	Existing Landscape and Biodiversity Features	13
5.1	Existing Landscape Constraints and Features.....	13
	Archaeology.....	14
5.2	Existing Biodiversity Features.....	14
	Statutory and Non-statutory Sites	14
	Habitats and Species	14
6.	Potential Impacts and Avoidance Through Design.....	21
6.1	Landscape and Visual.....	21
6.2	Biodiversity	21
6.3	Design Development and Impact Avoidance	22
	Design Development	22
	Impact Avoidance.....	25
6.4	Updated Surveys	26
6.5	Protected Species Licences.....	27
6.6	Ecological Clerk of Works and Ecological Steering Group.....	27
6.7	Tree and Hedgerow Works	28
6.8	Precautionary Working Methods	28
	Nesting Birds	29

Reptiles	29
Amphibians	29
Animal Welfare Requirements	30
Biosecurity Management Plan	30
Lighting	31
7. Proposed Green Infrastructure	31
7.1 Introduction	31
Permissive Paths	31
Sensitive Archaeological Sites	31
Biodiversity Zones	32
Woodland, Trees and Hedgerows	32
Grasslands	33
Aquatic and Riparian Habitats	34
Other Habitat Provisions	34
8. Management, Maintenance and Monitoring of Landscape and Biodiversity	34
8.1 Introduction	34
8.2 Implementation	35
Existing retained trees and shrubs.....	35
Creation of Permissive Paths.....	36
Native planting	36
Native Hedgerow Planting.....	37
Native Tree and Scrub Planting: General	38
Native Tree Planting: Woodland	39
Native Tree Planting: Woodland Edge and Scrub	40
Native Tree Planting: Hedgerow Trees	40
Traditional Orchards	40
Grassland	40
Semi-improved Grassland	41
Species-rich Grassland	42
Flower-rich Meadow	43
Tussock Grassland Margins as a Buffer	44
Sensitive Archaeological Sites	44
Aquatic Habitats and Waterbodies	45
Provision of Habitat Boxes	46
Natural Regeneration Areas.....	46
Creation of Habitat Piles	46
8.3 Establishment Management and Maintenance	46
Native planting: Establishment.....	47
Native Hedgerows	47
Native Woodland, Shrub with Trees, Woodland Edges and Traditional Orchard	
48	
Native planting: long-term management	48
Native Hedgerows	48
Native Woodland, Shrub with Trees and Woodland Edges	49
Traditional Orchard.....	50

Grassland: establishment	50
Grassland: long-term management	51
Sensitive Archaeological Sites	52
Aquatic habitats and waterbodies: establishment	53
Aquatic habitats and waterbodies: long-term management	53
Provision of habitat boxes	54
Bird / Barn Owl Boxes	54
Bat Boxes	54
Management and Maintenance of Permissive Paths	55
8.4 Post Construction Monitoring	55
9. Roles and Responsibilities	56
9.1 The Applicant and/or the Appointed Contractor(s)	56
9.2 The Appointed Ecologist (EcoCoW)	56
9.3 The Appointed Landscape Architect (LCoW)/ Arboriculturist	57
10. References	58
Appendix A Indicative Landscape Masterplan	62

Tables

Table 5-1: Notable Habitats within the Order limits	15
Table 5-2: Protected and notable habitats and species within the Order limits	17
Table 8-1: Indicative mix for native hedgerows	37
Table 8-2: Indicative woodland/scrub species	38
Table 8-3: Indicative species for semi-improved grassland	41
Table 8-4: Indicative species for species-rich grassland	42
Table 8-5: Indicative species for flower-rich meadow	43
Table 8-6: Indicative species for tussock grassland margins	44
Table 8-7: One off cultivation details for SAS grassland creation	45

1. Introduction

1.1 Background

- 1.1.1 This Framework Landscape and Ecology Management Plan (LEMP) has been prepared on behalf of Tillbridge Solar Ltd (the Applicant) in relation to the Tillbridge Solar Project (the Scheme).
- 1.1.2 The Tillbridge Solar Project (the Scheme) will comprise the construction, operation (including maintenance), and decommissioning of ground-mounted solar photovoltaic (PV) arrays. The Scheme will also include associated development to support the solar PV arrays.
- 1.1.3 The Scheme is made up of the Principal Site, the Cable Route Corridor and works to the existing National Grid Cottam Substation. The Principal Site comprises the solar PV arrays, electrical substations, grid balancing infrastructure, cabling and areas for landscaping and ecological enhancement.
- 1.1.4 The associated development element of the Scheme includes but is not limited to access provision; a Battery Energy Storage System (BESS), to support the operation of the ground mounted solar PV arrays; the development of on-site substations; underground cabling between the different areas of solar PV arrays; and areas of landscaping and biodiversity enhancement.
- 1.1.5 The Scheme also includes a 400kV underground Cable Route Corridor of approximately 18.5km in length connecting the Principal Site to the National Electricity Transmission System (NETS) at the existing National Grid Cottam Substation. The Scheme will export and import electricity to the NETS.
- 1.1.6 A full description of the Scheme is included in **Chapter 3: Scheme Description of the Environmental Statement [EN010142/APP/6.1]**. An overview of the Scheme and its environmental impacts is provided in the Environmental Statement **Non-Technical Summary [EN010142/APP/6.4]**.
- 1.1.7 This Framework LEMP forms part of the Development Consent Order (DCO) Application (the Application) and provides a framework for achieving the outline design, as presented in **Figure 3-1: Indicative Principal Site Layout Plan** of the ES **[EN010142/APP/6.3]**, including in particular the successful establishment and future management of biodiversity and landscape works. It sets out high-level measures and practices that will be implemented by the Applicant to establish, monitor, and manage landscape and ecological mitigation and enhancement (including biodiversity net gain (BNG)) measures embedded in the design of the Scheme. The latter will be achieved through habitat creation over and above that used for habitat mitigation.
- 1.1.8 As set out in the **draft DCO [EN010142/APP/3.1]**, a requirement will necessitate the submission and approval of a detailed LEMP, which must be in substantial accordance with the provisions set out in this Framework LEMP.

- 1.1.9 This Framework LEMP is intended to cover the operational life of the Scheme post construction and will be a live document that will continue to be refined based on ongoing discussions between the Applicant, statutory bodies, and relevant stakeholders. It will be updated by the Applicant into a final (detailed) LEMP prior to the commencement of works, in accordance with the requirements contained in Schedule 2 of the **draft DCO [EN010142/APP/3.1]**. The final LEMP will be updated at 5 year intervals throughout the operational life of the Scheme.
- 1.1.10 This document has been updated to take into account comments raised by Interested Parties through their relevant representations. At Deadline 3, this document was updated in response to the Examining Authority's First Written Questions. At Deadline 4, this document was updated following the Issue Specific Hearing 3. The document references have not been updated from the original submission. For the most up-to-date documents, the reader should access these through the **Guide to the Application [EN010142/APP/1.2(Rev06)]** and Schedule 13 of the **draft DCO [EN010142/APP/3.1(Rev05)]**.

1.2 The Scheme

- 1.2.1 The Order limits are located approximately 5 km to the east of Gainsborough and approximately 13 km to the north of Lincoln. The area within and surrounding the Order limits is primarily a rural setting, comprising open agricultural fields with sparse areas of woodland and villages.
- 1.2.2 There are two main areas within the Order limits:
- a. The 'Principal Site', which is the location where ground mounted solar PV panels, electrical sub-stations and BESS will be installed; and
 - b. The 'Cable Route Corridor', which will comprise the underground electrical infrastructure required to connect the Principal Site to national transmission system.

The Principal Site

- 1.2.3 The Principal Site is described below, with further details available in the following chapters and their associated appendices:
- a. **Chapter 9: Ecology and Nature Conservation** of the ES **[EN010142/APP/6.1]**; and
 - b. **Chapter 12: Landscape and Visual Amenity** of the ES **[EN010142/APP/6.1]**.
- 1.2.4 The Principal Site is located to the south of Harpswell Lane (A631), to the west of Middle Street (B1398), largely to the north of Kexby Road, and to the east of Springthorpe. It covers an area of approximately 1,345ha and is located entirely within the administrative area of West Lindsey District Council.
- 1.2.5 The topography is largely low-lying and relatively flat, with the exception of the west-facing scarp slope of Lincoln Cliff that runs roughly north-south along the eastern edge of the Principal Site.

- 1.2.6 The Principal Site is dominated (around 90%) by arable land, with woodlands and small wooded copses comprising around 1% of the total area. Woodland is predominantly broadleaved and semi-natural, with some plantation. A very small area (0.2%) of scrub was recorded. No Ancient Woodland is located within the Principal Site.
- 1.2.7 The arable land within the Principal Site is divided into largely medium-scale fields, generally bounded by hedges that total around 60 km in length. These hedges are mainly species-poor, comprising around 54 km in total. Some hedges include trees, but hedges are also absent along certain field boundaries, particularly towards the east of the Principal Site.
- 1.2.8 Areas of grassland are dominantly poor semi-improved and improved (3.81 % and 2.97 % of the total area respectively). Poor semi-improved grassland, alongside game bird margins, was recorded along the edges of some arable fields.
- 1.2.9 Field boundaries frequently comprise ditches, with around 27.5km recorded within the Principal Site, many of which were dry at the time of survey. These flow into watercourses within the catchments of the River Till, Fillingham Beck and Eau de Source of North Beck. Surveys have indicated that watercourses generally exhibit low habitat diversity and water quality pressures, with sedimented and reduced flows; and biodiversity value limited by shading, high levels of eutrophication and prolonged periods of drying and modification. Surveys of the small number of ponds in the Principal Site indicate poor water quality and high levels of organic enrichment.
- 1.2.10 Built form is limited within the Principal Site, being restricted to scattered, often isolated farms with associated outbuildings and hardstanding. A network of farm tracks and occasional surfaced adopted roads link fields, farmsteads and the wider highways network in addition to the A631, two rural, unclassified single-track roads run east-west across the Principal Site (Common Land and Kexby Road), with School Lane located to the north west corner.
- 1.2.11 A single Public Right of Way (PRoW) is located within the Principal Site: a bridleway running approximately 500m, extending south from Kexby Road. Aside from the roads and this bridleway, there is at present no public access within the Principal Site. However, a claimed PRoW links Harpswell and Glentworth along the base of Lincoln Cliff. This claimed route runs through the eastern edge of the Principal Site which is proposed for mitigation and enhancement only.
- 1.2.12 There are no sites internationally, nationally or regionally designated for their biodiversity importance within 10 km of the Principal Site nor any for which bats are a qualifying feature within 30 km of the Principal Site. There are two sites locally designated within 2 km of the Principal Site – Upton Grange Road Verges Local Wildlife Site (LWS) and Willingham to Fillingham Road Verges LWS. Both of these are within the Cable Route Corridor.
- 1.2.13 An Area of Great Landscape Value (AGLV), referenced in Central Lincolnshire Local Plan Policy S62, runs partly within and to the east of the Principal Site, with a small area of the designated area identified for

ecological mitigation to the south of Harpswell. There are no other areas designated on account of landscape value within the Principal Site.

The Cable Route Corridor

- 1.2.14 The Principal Site will be connected to Cottam National Grid Substation located at the decommissioned Cottam Power Station in Nottinghamshire via the Cable Route Corridor. The Cable Route Corridor is approximately 18.5km long (the approximate distance between the Principal Site and Cottam National Grid Substation).
- 1.2.15 The majority of the Cable Route Corridor is of a broadly similar character to the Principal Site, comprising mainly arable fields in low-lying or gently undulating agricultural land. The Cable Route Corridor crosses the River Trent southwest of the village of Marton, where it also runs across a low north-south oriented ridge immediately to the east of the village. The western termination, at the decommissioned coal fired power station and a small operational gas turbine facility, includes areas of restored land associated with the power station.
- 1.2.16 There are no sites internationally designated for their biodiversity importance within 10 km of the Cable Route Corridor nor any for which bats are a qualifying feature within 30 km of the Cable Route Corridor. There is one statutory designated nature site within 2 km of the Cable Route Corridor: Ashton's Meadow Sites of Special Scientific Interest (SSSI), which is located 1.5km west of the Cable Route Corridor. The Cable Route Corridor is also hydrologically connected to the Humber Estuary Special Area of Conservation (SAC) and Ramsar Site (approximately 40 km upstream of the Cable Route Corridor), which includes migratory fish as a qualifying feature.
- 1.2.17 Several areas of National Forest Inventory designation are present within the Cable Route Corridor or adjacent to it.
- 1.2.18 There are no areas designated on account of landscape value within the Cable Route Corridor.

2. Purpose of this Document

- 2.1.1 The purpose of this Framework LEMP is to set out the measures proposed to:
 - a. Mitigate the effects of the Scheme on landscape and biodiversity features, including through maintenance and monitoring;
 - b. Enhance the biodiversity, landscape and green infrastructure value of the Order limits, including with reference to BNG; and
 - c. Secure compliance with relevant national and local planning policies.
- 2.1.2 The Scheme has been designed, as far as is practicable, to avoid or reduce effects on landscape/visual amenity and biodiversity features. This has been through siting of Scheme components such as solar panels, substations and access routes in locations away from sensitive ecological features; and where impacts on visual amenity (such as views from residential receptors) and valued landscape elements will be minimised. With reference to the

Indicative Principal Site Layout Plan (**Figure 3-1 Indicative Principal Site Layout Plan** of the ES [EN010142/APP/6.3]), the Scheme includes areas of tree and woodland planting to mitigate visual effects and create/improve green infrastructure corridors, with 'Biodiversity Zones' (BZ) providing further areas of new habitats for ecological and green infrastructure enhancement.

- 2.1.3 The design also includes measures to avoid impacts on protected species to ensure compliance with legislation (see **Chapter 9: Ecology and Nature Conservation** and **Chapter 12: Landscape and Visual Amenity** of the ES [EN010142/APP/6.1]).
- 2.1.4 This document outlines the landscape and biodiversity impact avoidance measures that will be implemented prior to and during construction, operation and decommissioning of the Scheme; as well as the habitat restoration, enhancement, management and monitoring measures to be implemented once the Scheme is operational. Implementation of these measures is secured by Requirements contained in Schedule 2 of the **draft DCO [EN010142/APP/3.1]** requiring a detailed LEMP to be produced substantially in accordance with this Framework LEMP. The detailed LEMP will also be required to be submitted to and approved by the relevant authority or authorities.
- 2.1.5 In order to avoid potential conflicts in approach to impact avoidance and enhancement, this document identifies the measures required for both landscape and biodiversity together, in order to provide a cohesive strategy.
- 2.1.6 This Framework LEMP is structured as follows:
 - a. **Section 3** sets out the Scheme objectives and strategy in relation to landscape and biodiversity;
 - b. **Section 4** summarises relevant legislation and planning policy;
 - c. **Section 5** describes the existing landscape and biodiversity features and the constraints within the Scheme;
 - d. **Section 6** outlines the likely impacts and requirements for impact avoidance; how the Scheme design has been developed to avoid or reduce impacts; and how impacts will be avoided during construction, operation and decommissioning of the Scheme;
 - e. **Section 7** outlines the proposed green infrastructure associated with the Scheme;
 - f. **Section 8** provides a summary of how the landscape and biodiversity elements will be implemented, established and maintained; and
 - g. **Section 9** describes the roles and responsibilities of all parties involved in the delivery of the mitigation, enhancement and management proposals.

3. Landscape and Ecology Strategy

- 3.1.1 The integration of landscape and ecology into the design of the Scheme has been a key consideration from the outset. An interdisciplinary approach, from the initial process of identifying the preferred location of the Scheme and component elements (refer to example plans illustrated in **Figure 12-1**:

Initial Site Appraisal Plan and Figure 12-2: Site Constraints and Opportunities Plan of the ES [EN010142/APP/6.3]), which has resulted in the production of the **Figure 3-1: Indicative Principal Site Layout Plan** of the ES [EN010142/APP/6.3]). This layout forms the basis of the assessment presented in the ES as a worst-case scenario. The design is a result of an iterative process informed by site surveys, baseline data, consultation feedback and published landscape and biodiversity guidance or policy requirements.

- 3.1.2 The Scheme offers the opportunity to increase and enhance green infrastructure across the Order limits. Green infrastructure includes the network of natural spaces and habitat corridors, including woodlands, hedges, fields, trees, ponds and watercourses; as well as footpaths, bridleways and areas open to informal recreation. The enhancement and creation of green infrastructure will help integrate the Scheme with the wider landscape, as well as aligning with local and national planning policies and aspirations.
- 3.1.3 This Framework LEMP sets out how this will be carried out and also how embedded design mitigation will help to minimise the effects of the Scheme on the environment, including landscape character, visual amenity and biodiversity assets.
- 3.1.4 The overarching objectives of the Framework LEMP are to:
- Facilitate the conservation and protection of valued landscape and ecological features alongside improvement of the physical, natural and historic environment across the Order limits, ensuring that the Scheme is appropriately sited, softened and integrated. The green infrastructure framework should be seen as part of the essential infrastructure of the Scheme;
 - Secure the proposed mitigation planting and enhancement (including the woodland and BZ) as illustrated on the **Figure 3-1: Indicative Principal Site Layout Plan** of the ES [EN010142/APP/6.3]);
 - Protect ecological value through the retention of important habitats and features such as existing hedgerows and trees; and to enhance these through restoration and creation of more diverse habitats that will offer greater botanical and faunal interest; and to safeguard the habitats with particular reference to protected species;
 - Ensure the design and maintenance of landscape and biodiversity components preserves and enhances the character of the landscape and local distinctiveness, including where this is in line with published landscape character assessments;
 - Create new structural planting which links with existing habitats and to take account of species that are locally appropriate and existing vegetation patterns;
 - Create woodland or tree planting to help reduce visual impacts for receptors such as residents and recreational users, but also taking account of existing landscape qualities and protected species that require open land for breeding and long-range views;

- g. Use native indigenous species of local provenance wherever appropriate;
- h. Provide, where identified, a variety of foraging, nesting and roosting opportunities for protected and notable species, including bats, badgers, invertebrates, amphibians, reptiles and birds;
- i. Create floristically rich habitats, to support a greater assemblage of species and give rise to enhanced foraging opportunities;
- j. Improve water quality and aquatic habitats, through improvements to watercourses and ponds and reduced run-off and in conjunction with the drainage strategy;
- k. Provide a framework for monitoring and reviewing the landscape measures' implementation and establishment; and
- l. Ensure the mitigation proposed as part of the Scheme remains effective at reducing identified environmental effects.

4. Legislative and Policy Framework

4.1 Introduction

- 4.1.1 The legislation and policies relevant to matters considered within the Framework LEMP are summarised below. For more details, refer to **Appendix 9-1: Ecology and Nature Conservation Legislation, Policy and Guidance** and **Appendix 12-1: LVIA Legislation, Policy and Guidance** of the ES [EN010142/APP/6.2].

4.2 Legislation

- 4.2.1 Legislation relevant to the Framework LEMP includes:
 - a. Directive 2009/147/EC on the conservation of wild birds (Birds Directive) (Ref-1);
 - b. Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora (Habitats Directive) (Ref-2);
 - c. Regulation (EU) 1143/2014 on the prevention and management of the introduction and spread of invasive alien species (IAS) (Ref-3);
 - d. The Ramsar Convention 1971 (Ref-4);
 - e. Wildlife and Countryside Act (WCA) 1981 (as amended) (Ref-5);
 - f. Countryside and Rights of Way (CROW) Act 2000 (Ref-6);
 - g. Natural Environment and Rural Communities (NERC) Act 2006 (Ref-7);
 - h. The Conservation of Habitats & Species Regulations 2017 (as amended) (the Habitats Regulations) (Ref-8) and The Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019 (Ref-9);
 - i. The Environment Act 2021 (Ref-10);
 - j. The Protection of Badgers Act 1992 (Ref-11);
 - k. The Hedgerow Regulations 1997 (Ref-12);

- l. The Water Environment (Water Framework Directive) (England and Wales) Regulations 2017 (Ref-13);
- m. Invasive Alien Species (Enforcement and Permitting) Order 2019 (Ref-14);
- n. Eels (England and Wales) Regulations 2009 (Ref-15);
- o. Salmon and Freshwater Fisheries Act 1975 (Ref-16);
- p. Animal Welfare Act 2006 (Ref-17); and
- q. The Town and Country Planning (Tree Preservation) (England) Regulations 2012 (Ref-18).

4.3 Planning Policy

4.3.1 Planning policy relevant to the Framework LEMP includes:

- a. Overarching National Policy Statement for Energy (EN-1) (2023) (Ref-19);
- b. National Policy Statement for Renewable Energy (EN-3) (2023) (Ref-20);
- c. National Policy Statement for Electricity Networks Infrastructure (EN-5) (2023) (Ref-21);
- d. National Planning Policy Framework (NPPF) (2023) (Ref-22);
- e. National Planning Practice Guidance (NPPG) (Ref-23);
- f. Central Lincolnshire Local Plan 2012-2036, adopted 24 April 2017, specifically Policies LP20: Green Infrastructure Network and Policy LP21: Biodiversity and Geodiversity (Ref-24); and
- g. Bassetlaw District Council Core Strategy and Development Management Policies Development Plan Document, adopted 22 December 2011, specifically Policy DM9: Green Infrastructure, Biodiversity and Geodiversity, Landscape; Open Space and Sports Facilities (Ref-25).

4.3.2 A number of adopted and draft Neighbourhood Plans include policies relating to views, design principles, green infrastructure, landscape character and open space. Those of relevance are:

- a. Glentworth Neighbourhood Plan (Ref-26);
- b. Corringham Neighbourhood Plan (Ref-27);
- c. Hemswell and Harpswell Neighbourhood Plan (Ref-28);
- d. Rampton and Woodbeck Neighbourhood Plan (Ref-29);
- e. Sturton by Stow and Stow Neighbourhood Plan (Ref-30); and
- f. Treswell and Cottam Neighbourhood Plan (Ref-31).

4.4 Other Biodiversity Guidance

4.4.1 Other guidance documents relevant to the assessment of the impacts of the Scheme on biodiversity include:

- a. Biodiversity 2020: A strategy for England's Wildlife and Ecosystem Services with regards to marine habitats, ecosystems, and fisheries

- (Ref-32) which includes a set of strategic goals and targets to drive action for biodiversity;
- b. 25-year Environment Plan (Ref-33) which sets out ten goals to improve the natural environment over the next 25 years;
 - c. UK Post 2010 Biodiversity Framework (Ref-34) which sets out priority habitats and species in England;
 - d. Biodiversity Guidance for Solar Developments (Ref-35) provides guidance to planners and the solar industry on how biodiversity can be supported on solar farms;
 - e. Mitigating biodiversity impacts associated with solar and wind energy development: Guidelines for project developers (Ref-36) provides practical support for solar and wind energy developments by effectively managing risks and improving overall outcomes related to biodiversity and includes guidance and reference for the approach to impacts on biodiversity and mitigation;
 - f. Natural England and Department for Environment, Food and Rural Affairs (DEFRA) Standing Advice (protected species) (Ref-37) which provides guidance on protected and notable species and includes reference to the best practice approaches for survey, mitigation and compensation;
 - g. Lincolnshire Biodiversity Action Plan (3rd edition) (Ref-38) provided context to inform identification of threatened or uncommon species of local relevance, alongside priorities for conservation and enhancement targeted at a local level;
 - h. Green Infrastructure Study for Central Lincolnshire (2011) (Ref-39) which identifies strategic green corridors (including along the Trent valley) and strategic green access links (along the Trent and Lincoln Cliff) alongside green infrastructure zones, for which key green infrastructure assets and opportunities are identified;
 - i. Biodiversity Opportunity Mapping for Central Lincolnshire (Ref-40) was undertaken by the Greater Lincolnshire Nature Partnership and is displayed on the Central Lincolnshire Local Plan map. It identifies areas with opportunities for creation and management, including on a field-by-field basis; and
 - j. Nottinghamshire Biodiversity Action Plan (Ref-41) provided context to inform identification of threatened or uncommon species of local relevance, alongside priorities for conservation and enhancement targeted at a local level.

4.5 Landscape Character Documents

- 4.5.1 The Scheme is covered by published landscape character assessments (LCA) and related studies at national, regional and county levels. Local planning authorities use published landscape character assessments as part of their planning policy evidence base. These published assessments often provide specific guidance or recommendations on managing landscape change. A summary is provided below. Further details are provided in **Appendix 12-3: LVIA Landscape Baseline** of the ES [EN010142/APP/6.2].

National Character Areas (NCA)

- 4.5.2 NCA 45: North Lincolnshire Edge with Coversands (2014) (Ref-42) covers the eastern edge of the Principal Site, along Lincoln Cliff. Published 'Statements of Environmental Opportunity' (SEO) include references to establishing networks of linking habitats to strengthen biodiversity and landscape character; expanding semi-natural habitats; and retaining the inspirational long views. Landscape opportunities include protection of the scarp slope from inappropriate development and retaining long, panoramic views; and increasing woodland cover on the slope.
- 4.5.3 NCA 48: Trent and Belvoir Vale (2013) (Ref-43) encompasses the majority of the Principal Site and all of Cable Route Corridor. SEO include references to enhancing the woodland and hedgerow network to benefit landscape character and habitat connectivity. Landscape-scale projects such as those delivered by the Trent Vale Landscape Partnership are noted under 'drivers for change'. 'Landscape opportunities' also note the management of hedgerows, including to strengthen historic fields patterns; and the conservation of other high-quality habits, including management of species-rich grassy roadside verges.

East Midlands Landscape Character Assessment

- 4.5.4 Regional Landscape Character Type (RLCT 3a) Floodplain Valleys of the East Midlands Landscape Character Assessment (Ref-44) covers the area of the Cable Route Corridor around the River Trent, notes 'key aims' that include protection of existing river valley features; restoration of river valley meadows; and provision of a diverse range of habitats.
- 4.5.5 RLCTS 4a Unwooded Vales covers the majority of the Principal Site and the Cable Route Corridor. Key aims include restoration and creation of new hedgerows, creation of permanent pasture alongside watercourses and increasing the occurrence of semi-natural habitats. Extensive woodland planting is noted as not being generally considered as appropriate, but limited tree planting could help create a mixed pattern of land-use, increase the occurrence of semi-natural habitats and maintain the perception of a well-treed landscape.
- 4.5.6 RLCTS 6a Limestone Scarps and Dipslopes encompasses the north-south escarpment of Lincoln Cliff, parallel to Middle Street. Key aims include the protection of key views and vistas; siting infrastructure away from visually prominent locations; protection of existing landscape features, such as restoration of hedgerows, stone walls, grassland and areas of pasture; and planting woodland to enhance the scarp slope.

West Lindsey Landscape Character Assessment

- 4.5.7 Landscape Character Type (LCT) 2 Trent Valley of the West Lindsey Landscape Character Assessment (Ref-45) covers the area around Marton and the eastern side of the River Trent. Published 'Principles for Landscape Management' include the retention of hedgerows and hedgerow trees.
- 4.5.8 LCT 3 The Till Vale encompasses much of the Principal Site and the Cable Route Corridor. Stated Principles for Landscape Management include the

retention of buffer zones and new planting along rivers and streams; management of existing small farm woodlands, shelterbelts and trees along rural roads; and creation of buffer zones around woodland blocks.

- 4.5.9 LCT 4 The Cliff covers the easternmost edge of the Principal Site. Stated Principles for Landscape Management include management of trees and hedges to the margins and entrances to villages; scope for new hedgerow planting on the western edges of villages to reinforce the contrast in character between the Cliff landscape and that of open arable farmland to the west (framing rather than obscuring views to village churches and other buildings, or landscape features with historic interest); and reversion of arable land to grazing pasture. The section 'Principles for Accommodating Development' notes that new development and tree planting should be carefully sited and designed to avoid compromising the views associated with the design historic parkland landscapes that are characteristic of many villages in the LCT.

Bassetlaw Landscape Character Assessment

- 4.5.10 Trent Washlands (TW) Policy Zone (PZ) 21 Cottam, Rampton and Church Laneham Village Farmlands of the Bassetlaw Landscape Character Assessment (Ref-46) covers the area to the west of Cottam Power Station, including part of the Cable Route Corridor. A policy of 'Conserve and Reinforce' is stated, with Landscape Actions that generally relate to the conservation and restoration of traditional hedge and field patterns; and conservation of mature hedge lines along tracks.
- 4.5.11 TW PZ 22: Cottam River Meadowlands covers the area to the north of Cottam, including part of the Cable Route Corridor. A policy of 'Conserve and Reinforce' is stated, with Landscape Actions including the conservation and reinforcement of traditional historic patterns of hedges, fields, grazing pasture and mature trees along the Trent.
- 4.5.12 TW PZ 48: Littleborough Village Meadowlands is a narrow area along the western side of the River Trent, including part of the Cable Route Corridor. A policy of 'Conserve' is stated, with Landscape Actions including the enhancement and restoration of ecological (including waterside) diversity, pastoral character, and meadowland hedgerows.

Neighbourhood Plan Supporting Documents

- 4.5.13 Character assessments, profiles and design guides are provided as part of the evidence base for Neighbourhood Plans. A summary of key points relevant to the Framework LEMP, including the with reference to mitigation woodland planting and the relationship with views, are described below:

Corringham Character Assessment

- 4.5.14 Rural roads, with verges, ditches and hedgerows, being a "*strong, singular character*" and of value to pedestrians, in the absence of the Parish's dedicated PRow network (Ref-47).

Neighbourhood Character Profile for Glentworth

- 4.5.15 Recreational walking, horse riding and cycling routes, including Middle Street, Kexby Road and Northlands Road, which are noted as ‘Green Infrastructure’, alongside areas of woodland, hedgerows and road verges; ‘Gateways’ into the village, including the junction of Middle Street and Hanover Hill, and associated woodland; and views considered to be of importance, including southwest from Middle Street to Glentworth Hall (Ref-48).

Hemswell and Harpswell Character Assessment

- 4.5.16 ‘Key Views’, including west across open countryside from Common Lane in Harpswell, east from the same location towards the rising wooded Cliff; and expansive views across the Till Vale from Middle Street; the presence and associated history of the demolished post medieval Harpswell Hall and Gardens (Scheduled Monument), including views out towards the surrounding countryside from the former moat; and the accessible green space and associated woodland and heritage interest south of Hall Farm, including permissive paths (Ref-49).

Rampton and Woodbeck Character Assessment (2018)

- 4.5.17 Torksey Ferry Road described as a “*quiet rural land with an informal character*” and where unenclosed grass verges are present; and identified ‘key views’, including east along Torksey Ferry Road and from locations on the eastern edge of Rampton (Ref-50).

Sturton by Stow and Stow Neighbourhood Profile (2019)

- 4.5.18 Views to the west from Normanby, towards the Trent Valley, north from Coates across the Till valley; and those that include Stow Minster; hedges to the north of East Farm at Normanby, which are noted as species-rich; and road verges with wildflowers (Ref-51).

Treswell with Cottam Character Assessment (2018)

- 4.5.19 Overcoat Lane and Wells Lane described as “*pedestrian links*” and ‘Significant hedgerows’ and ‘Significant trees/tree clusters’ within Cottam (Ref-52).

4.6 Biodiversity Net Gain

- 4.6.1 It is government policy in NPS EN-1 that nationally significant development proposals provide opportunities for building-in beneficial biodiversity as part of good design. The NPPF (Ref-22) states that “*planning decisions should minimise impacts on and provide net gain for biodiversity*”.
- 4.6.2 Schedule 15 of the Environment Act 2021 (Ref-10) makes provision for BNG in relation to development consent for Nationally Significant Infrastructure Projects (NSIPs), although the requirement for NSIPs will not become mandatory until 2025. The Applicant is committed to delivering BNG in accordance with the **draft DCO [EN010142/APP/3.1]**, which requires the Applicant to produce a biodiversity net gain strategy substantially in accordance with the prescriptions set out in this Framework LEMP, which in

turn, accords with the terms of the **Biodiversity Net Gain (BNG) Report [AS-062]**.

- 4.6.3 Paragraph 1.4.6 of the **BNG Report [AS-062]** includes an express commitment to achieving a minimum of 10% BNG. However, with the implementation of the mitigation and enhancement measures within this Framework LEMP (which is secured through Requirement 7 of the **draft DCO [EN010142/APP/3.1(Rev05)]**), the current plans for the Scheme, as illustrated by the Indicative Landscape Masterplan (**Appendix A**), are predicted to result in a net gain of 64.44% for area-based habitat units, 17.28% for hedgerow units, and 22.94% for watercourse units. The detailed design of the Scheme would be in substantial accordance with these plans, as secured through Requirement 7 of the **draft DCO [EN010142/APP/3.1(Rev05)]**.

5. Existing Landscape and Biodiversity Features

5.1 Existing Landscape Constraints and Features

- 5.1.1 The following section provides a summary of the key constraints and sensitive features related to landscape and visual amenity within or in proximity to the Order limits as presented by **Chapter 12: Landscape and Visual Amenity** of the ES **[EN010142/APP/6.1]**.
- 5.1.2 These include, but are not limited to:
- a. Expansive, panoramic views from Lincoln Cliff that are frequently noted in published landscape character assessments, Neighbourhood Plans and protected through the AGLV Local Plan designation; and views towards the Cliff as a prominent topographic feature from the wider area;
 - b. Open, rural views that characterise the intensive farmland of the Till Vale, including from the edges of more enclosed villages and where these expansive views may be appreciated by residents and recreational users;
 - c. Intact hedgerows, particularly those that are denser and taller, including along east-west routes that formerly linked villages with enclosed land, such as the western end of Common Lane and Kirton Gate Lane;
 - d. Blocks of woodland such as Harpswell Wood that punctuate the intensive farmland, provide landmarks and offer isolated areas of greater landscape value, sometimes connected by shelter belts and/or smaller areas of recent plantation;
 - e. The River Trent, as a key landscape feature that has informed historic development of the area, offers visual and recreational value; and provides an important green/blue infrastructure and biodiversity corridor;
 - f. Isolated ponds and ditches, although these are considered to be of limited landscape and biodiversity value;

- g. PRow, largely located within the Cable Corridor Route, providing opportunities to experience the wider landscape, particularly along the Trent Valley;
- h. Quiet, rural lanes that offer recreational value, particularly close to villages and where ProW are limited;
- i. Extended views of the Principal Site from the A631 along the northern boundary, although receptors along this route are generally considered to be of lower sensitivity; and
- j. Views to and from heritage assets, alongside interrelationships between heritage assets and the landscape. This includes Harpswell Hall, a Scheduled Monument, with a former moat and prospect mound that afford views into the open landscape of the Principal Site; and the Grade II* Glentworth Hall.

Archaeology

- 5.1.3 During the archaeological trenching works completed for the assessment provided in **Chapter 8: Cultural Heritage** of the ES [EN010142/APP/6.1], several areas have been identified for archaeological preservation. These are areas in which significant buried archaeological remains and/or surface earthworks have been identified and no development on these areas has been agreed with the Lincolnshire County Council Archaeologist.
- 5.1.4 There are 26 of these areas, which are known as 'Sensitive Archaeological Sites', and are presented on the **Indicative Landscape Masterplan (Appendix A)** and further detail is presented in **Chapter 8: Cultural Heritage** of the ES [EN010142/APP/6.1].

5.2 Existing Biodiversity Features

- 5.2.1 The following section summarises the baseline detail for biodiversity, as presented in **Chapter 9: Ecology and Nature Conservation** of the ES [EN010142/APP/6.1].

Statutory and Non-statutory Sites

- 5.2.2 The Order limits do not lie within the boundary of any statutory site designated for nature conservation.
- 5.2.3 Three non-statutorily designated sites (Willington to Fillingham Road Verges Local Wildlife Site (LWS), Upton Grange Road Verges LWS and Cow Pasture Lane Drains LWS, designated for biodiversity, are within the Order limits.
- 5.2.4 No areas of ancient woodland are within or bordering the Order limits.

Habitats and Species

- 5.2.5 **Table 5-1** presents the notable habitats within the Order limits, and **Table 5-2** presents the recorded protected and notable flora and fauna identified by the ecological surveys (refer to **Appendices 9-2 to 9-11** of the ES [EN010142/APP/6.2]) within the Order limits.

Table 5-1: Notable Habitats within the Order limits

Habitat Type	Location	Status
Broadleaved woodland – semi-natural	Within the Principal Site, a linear strip of broadleaved woodland extends north into the Principal Site from Harpswell Wood. There is also a small strip of this habitat within the Cable Route Corridor south of Glentworth Road. The Order limits borders several areas of semi-natural broadleaved woodland, both in the Principal Site and in the Cable Route Corridor.	Local Biodiversity Action Plan (LBAP) Habitat; Lowland Mixed Deciduous Woodland and Wet Woodland – Habitat of Principal Importance (HaPI).
Acid grassland – semi-improved	Small area of this habitat is present within the Cable Route Corridor (Cottam Power Station).	Lowland dry acid grassland is a HaPI and an LBAP in Lincolnshire and Nottinghamshire.
Calcareous grassland – semi-improved	This habitat is present along the most northern access road in the Cable Route Corridor and is part of Upton Grange Road Verges LWS.	Lowland calcareous grassland is a HaPI. Is associated with a locally designated wildlife site.
Standing Water	There are 17 ponds located within the Order limits.	Ponds of certain criteria are a HaPI, however all ponds that were assessed through PYSM survey did not meet criteria for a HaPI, according to UK BAP criteria.
Running Water	The River Trent is within and crossed by the Cable Route Corridor. Watercourses from the Eau de Source to Northorpe Beck, Fillingham Beck and River Till catchments lie within the Principal Site.	Rivers are a HaPI.
Arable field margins	The majority of the Order limits is in arable production, with many of the fields supporting a margin.	HaPI.

Habitat Type	Location	Status
Hedgerows without trees (intact and defunct)	There are many hedgerows across the Order limits.	HaPI. LBAP habitat in Lincolnshire and Nottinghamshire.
Hedgerows with trees (intact and defunct)	There are many hedgerows across the Order limits.	HaPI. LBAP habitat in Lincolnshire and Nottinghamshire.

Table 5-2: Protected and notable habitats and species within the Order limits

Ecological Feature	Detail
Aquatic macrophyte and macroinvertebrates	The data search returned records of Willow Emerald Damselfly (<i>Chalcolestes viridis</i>) (formerly <i>Lestes viridis</i>) within the Study Area, but outside of the Order limits. No protected aquatic invertebrate species were identified within the Study Area. There were no records of White-clawed Crayfish (<i>Austropotamobius pallipes</i>). The Nationally Scarce aquatic beetle (<i>Helophorus dorsalis</i>) was recorded within a single water body within the Principal Site.
Fish, including European Eel (<i>Anguilla Anguilla</i>), Spined Loach (<i>Cobitis taenia</i>), Atlantic Salmon (<i>Salmo salar</i>), Brown (or Sea Trout) (<i>Salmo trutta</i>) and a species of lamprey	No Environment Agency fish surveys have been undertaken within the Study Area, but records of European Eel were identified at Squires Bridge on the River Till, outside of the Order limits. Records of Spined Loach were also identified at Squires Bridge on the River Till, outside of the Order limits. No field surveys were undertaken as desk study data was sufficient. Atlantic Salmon Brown Trout and a species of lamprey are present within Cable Route Corridor in the River Trent and tributaries.
Flora/plants	The desk study identified sixteen records of nine species of notable flora occurring within the Study Area (but outside of the Order limits), including Tasteless Water-pepper (<i>Persicaria mitis</i>). The field surveys identified five arable fields that supported notable arable plant species of Local importance. In general, grassland around the Order limits is poor semi-improved or improved grassland. However, there are two LWSs within the Order limits that, in terms of UKHab classification, are best placed within g3a Lowland meadows priority habitat and of County Importance.
Terrestrial invertebrates	There were no records of terrestrial invertebrates identified through the desk study. Ten areas of habitat (grassland margins, grassland field) of potentially more value to terrestrial invertebrates, within the Principal Site. Three notable species (the ground beetle (<i>Stenolophus teutonius</i>), and moths, Mottled Umber (<i>Erannis defoliaria</i>) and Latticed Heath (<i>Chiasmia lathrate</i>)) recorded in May 2023, but no legally protected species or Species of Principal Importance (SPI).

Ecological Feature	Detail
Great Crested Newt (<i>Triturus cristatus</i>)	The desk study identified the presence of this species within a single water body within the Principal Site and in water bodies to the east of the Cable Route Corridor (within 250 m of the Order limits), near Cottam. Positive eDNA samples for Great Crested Newt were returned from two water bodies within the Order limits (one water body within the Principal Site and one water body within the Cable Route Corridor) and one water body outside of the Order limits. In addition, the collaborative dataset identified a further pond just outside (within 100 m) of the Cable Route Corridor, which returned a positive eDNA sample, as confirming the presence of Great Crested Newt.
Reptiles and Amphibians	The data search returned two records of Grass Snake (<i>Natrix 18aubenton</i>) within the Study Area (but outside of the Order limits) and a single record of Common Lizard (<i>Zootoca vivipara</i>) outside of the Order limits. The data search also returned records of three species of amphibian (Smooth Newt <i>Lissotriton vulgaris</i>, Common Frog <i>Rana temporaria</i> and Common Toad <i>Bufo bufo</i>) occurring within the Study Area. No reptiles were recorded during surveys of the Principal Site. Small numbers of Common Toad were recorded within the Principal Site. The collaborative dataset identified an area of tussocky grassland, within the Cable Route Corridor, as supporting populations (of Local Importance) of Common Lizard and Grass Snake.
Breeding Birds	The data search returned records of 99 bird species, including specially protected or notable bird species from within the Study Area. Breeding assemblage of 55 bird species within the Principal Site with a further two species recorded within the Cable Route Corridor from the collaborative dataset.
Non-breeding Birds	The data search returned records of 99 bird species, including specially protected or notable bird species from within the Study Area. Field surveys of the Study Area recorded 65 species of non-breeding bird.
Bats	The data search returned records of at least eight bat species occurring within the Study Area, most of which were field observations that could relate to roosting and/or foraging/commuting bats. The desk study also

Ecological Feature	Detail
	identified roosts of two species of bat (Common Pipistrelle <i>Pipistrellus pipistrellus</i> and Brown Long-eared Bat <i>Plecotus 19aubent</i>) within 2 km of the Order limits, but none from within the Order limits. Based on the field data collected from the Preliminary Roost Assessment survey and bat activity surveys, there are likely to be roosts within or close to the Order limits of Common Pipistrelle and Soprano (<i>Pipistrelle Pipistrellus pygmaeus</i>), Noctule (<i>Nyctalus 19aubent</i>), Leisler's bat (<i>Nyctalus leisleri</i>), Myotis species (e.g. Daubenton's <i>Myotis 19aubentoniid</i> or Natterer's <i>Myotis nattereri</i>) and Brown Long-eared. This is based on suitable habitat features such as suitable trees and buildings for roosting and the timing of observations in relation to expected emergence times (from static and transect data).
Riparian Mammals	The data search and desk study identified the presence of Water Vole, Otter and Mink within the Study Area, including records of all three species from within the Cable Route Corridor. No evidence of riparian mammals was recorded within the Principal Site. The collaborative dataset identified the River Trent as supporting a population of Otter, of Local Importance.
Badger (<i>Meles meles</i>)	Presence of this species within the Principal Site. Badger was recorded through the desk study, with the majority of records concerning Badger that were dead near roads, outside of the Order limits. Field surveys identified Badger setts within and up to 50 m from the Order limits.
Brown Hare (<i>Lepus europaeus</i>)	The data search returned records of Brown Hare within the Study Area and was recorded within the Principal Site during other ecological surveys.
Hedgehog (<i>Erinaceus europaeus</i>)	The data search returned records of Hedgehog within the Study Area. The species has the potential to occur across the Order limits.
Invasive non-native species	The data search recorded a non-native, but non-invasive, freshwater amphipod shrimp (<i>Crangonyx psuedogracilis/floridanuiii</i>) at the Environment Agency Fillingham Beck monitoring site in 2016. There were also records of the non-native but non-invasive New Zealand Mud Snail (<i>Potamopyrgus antipodarumii</i>) within the Study Area, between 2013 and 2016.

Ecological Feature	Detail
	The data search also returned records of seven invasive and / or, non-native species: Mitten Crab (<i>Eriocheir sinensis</i>), New Zealand Mud Snail, a freshwater amphipod shrimp (<i>Gammarus fasciatus</i>), American Mink and New-Zealand Pigmyweed (<i>Crassula helmsii</i>), Himalayan Balsam (<i>Impatiens glandulifera</i>) and Japanese Knotweed (<i>Reynoutria japonica</i>). Pond macrophyte surveys identified the invasive non-native species (INNS) Nuttall's Waterweed (<i>Elodea nuttallii</i>) and New Zealand Pigmyweed within the Study Area.

6. Potential Impacts and Avoidance Through Design

6.1 Landscape and Visual

6.1.1 Key landscape and visual effects of the Scheme, prior to the incorporation of mitigation, will include:

- a. Loss of the dominant agricultural qualities of the Principal Site, such that the overall landscape character will be dominated by solar infrastructure.
- b. Impacts on views both within and around the Principal Site, predominantly through the introduction of solar infrastructure as an incongruous and prominent element.
- c. Loss of characteristic panoramic, open rural views where these become enclosed through the aim of mitigating views of solar infrastructure; such views may be valued by residents and recreational users of rural routes, and/or noted in Neighbourhood Plans.
- d. Localised temporary and permanent loss of hedgerows, including to create access tracks for construction and maintenance of the solar PV infrastructure, and during construction along the Cable Route Corridor.
- e. Localised temporary loss of more species-rich grassland, such as along the River Trent, although the extent of these effects will require confirmation through ecological surveys.
- f. Impacts, including a reduction in tranquillity and an increase in traffic movement in and around the Order limits, during the construction phase.

6.2 Biodiversity

6.2.1 The Scheme will result in the temporary and/or permanent loss of the following habitats:

- a. Localised temporary and permanent loss of hedgerows to create access tracks for construction and maintenance of the solar PV infrastructure and during construction along the Cable Route Corridor.
- b. Localised damage to individual trees, including those associated with woodland blocks, to facilitate access tracks during construction within the solar PV areas and Cable Route Corridor.

6.2.2 There will be potential adverse impacts on several protected or notable species during construction of the Scheme. These include negative, but not significant, impacts to:

- a. Breeding Birds – temporary and permanent loss of arable farmland habitat across the Scheme during construction, as well as noise and visual disturbance. The loss of arable habitat within the Principal Site will lead to the short-term displacement of Skylark and Quail.
- b. Bats – temporary or permanent loss of foraging habitat during construction and potential displacement of bats during operation.

6.3 Design Development and Impact Avoidance

- 6.3.1 The design of the Scheme has considered biodiversity, landscape and visual constraints from the outset. These considerations and corresponding design principles are stated in the **Design and Access Statement [EN010142/APP/7.3]** and **Outline Design Principles Statement [EN010142/APP/7.4]** submitted alongside the DCO application. A summary is provided below, along with the impact avoidance measures that will be implemented, as relevant and appropriate, prior to and during construction of the Scheme, to avoid as far as practicable the effects identified in Sections 6.1 and 6.2 above.

Design Development

- 6.3.2 The following considerations and principles have informed the site selection and design process for the Scheme. Where these include elements of the design are incorporated into the Indicative Principal Site Layout Plan (**Figure 3-1 Indicative Principal Site Layout Plan** of the ES [EN010142/APP/6.3]) this represents embedded mitigation.
- 6.3.3 Embedded mitigation prior to the Preliminary Environmental Information (PEI) Report stage disclosed at statutory consultation includes, but is not limited to:
- Avoidance of any solar infrastructure from the AGLV designation along the prominent scarp slope of Lincoln Cliff.
 - Withdrawal, during the early stages of design, of the southern Order limits (in combination with landowner negotiations) from areas around Ingham and Fillingham, which include sensitive features such as PRow, Fillingham Lake and closer-range views from Fillingham Castle.
 - Avoiding areas of open or slightly undulating topography along the base of Lincoln Cliff, including west of Glentworth and Harpswell.
 - Identifying relevant Neighbourhood Plan 'key views' to highlight potential areas for mitigation, such as west of Harpswell.
 - Creating larger buffers to the east of Springthorpe, following site surveys that identified more open views from certain properties, and the presence of a temporary voluntary permissive bridleway and recently adopted byway that provide recreational amenity in an area where PRow are limited.
 - Creating a buffer between the Scheme and the proposed Cottam Solar Project to the south, using these fields for ecological and landscape mitigation only.
 - Providing buffers around residential properties, with woodland mitigation where appropriate, but also cognisant of residents' appreciation of open views.
 - Provision of woodland screening along the western side of Middle Street, to limit views of the Scheme at the closest point to Lincoln Cliff.
 - Ecological mitigation and enhancement within the area of the Principal Site that extends up the Lincoln Edge scarp slope and use of higher

flood-risk areas for ecological mitigation, with scope for wetland habitats and enhancement.

- j. Reinstatement and/or improvement of field boundaries, particularly in the more open parts of the Principal Site such as west of Harpswell, to limit visibility of the Scheme and increase landscape condition and habitat connectivity; although this needs to be balanced with retention of open views and habitats for ground-nesting birds.
- k. Use of smaller and/or peripheral fields for mitigation, such as along the south side of the A631.
- l. Identifying areas for woodland belts to the west of Harpswell, to mitigate impacts on views from the Scheduled Monument moated site and historic gardens that are accessible through permissive paths and open space.
- m. Use of existing farm tracks and field openings as the preferred routes for construction access, minimising loss of hedgerows.
- n. Highlighting risks for construction access through Glentworth where sharp bends may require vegetation removal (identified as being of value in the Neighbourhood Plan), or where residents have expressed concerns about loss of tranquillity along quiet rural lanes.
- o. Proposed siting of substations and other infrastructure in locations where existing screening will limit visibility.
- p. Identification of locations along the Cable Route Corridor where sensitive receptors may require mitigation, e.g. through amendments to the preferred route such as through Cottam village.

6.3.4 Embedded mitigation following the PEI Report at statutory consultation includes, but is not limited to, the following measures, which are shown on the **Indicative Landscape Masterplan (Appendix A)**:

- a. Provision of wider buffers to solar infrastructure, including 5 m from hedgerows and 15 m from all trees above 4 m height, based on the extent of the canopy drip line and heights indicated on the topographic survey; 10 m from all ponds, with the exception of a 50 m buffer around from the pond north of Grange Cottages (Springthorpe) due to the presence of protected species; and 10m from the top of watercourse banks, as opposed to from the centre of watercourse.
- b. Removal of panels from three fields at the northeastern corner of the Principal Site to mitigate heritage and landscape impacts relating to the Scheduled Monument at Harpswell Hall. These include designed views from the former 'prospect mound' and similar views from permissive paths along the historic moat.
- c. Removal of solar infrastructure from the two fields immediately east of the Harpswell Hall (Biodiversity Zone (BZ) 8), to mitigate impacts from the Scheduled Monument and also reduce the presence of solar infrastructure close to a permissive circular walking route around the two fields to the east.
- d. Removal of solar infrastructure from the field north of Kexby Road and west of Northlands Road to mitigate heritage impacts and reduce

visibility for users and residents of Kexby Road and from viewpoints around Glentworth. This area is now proposed for biodiversity mitigation and enhancement, as the eastern part of BZ 13.

- e. Provision of woodland screening and an area of biodiversity enhancement south of Springthorpe Grange, to reduce visual impacts on the open views from the south of the property.
- f. Amendments to the proposed woodland and biodiversity enhancement around the former orchard area north of Grange Cottages on School Lane, mainly to reflect great crested newts within the pond, but also allowing a wider buffer to the relic vegetation whilst maintaining screening of the proposed substation for the Cottages.
- g. Extension to the biodiversity enhancement area (BZ6) into the field south of Hemswell Grange and Grange Cottage on the A631, to create a wider buffer with tree planting to limit residential view of panels.
- h. Provision of woodland or shelter belt planting along the south side of the Order limits and mitigation area south of Kexby Road (BZ 14); and the removal of proposed trees and hedges along the southern boundary of Kexby Road. This amendment reflects concerns raised by residents within properties along Kexby Road about loss of open views to the south whilst retaining screening to the Cottam Solar Project.
- i. Enhancements to existing hedgerows running east-west through the Principal Site, to create more robust and continuous green infrastructure corridors, e.g. BZ 10 east of Harpswell Wood.
- j. Provision of two permissive paths connecting Common Lane with Kexby Road and Northlands Road, offering recreational access in an area where PRoW are limited and also improving north-south off-road links. The paths will be located within 25 m wide corridors that will allow sufficient space for planting such as hedgerows to screen solar infrastructure and offer biodiversity and visual interest to users.
- k. Outline measures to prevent direct and/or indirect damage to retained trees, tree groups, hedgerows and woodlands (including ancient and veteran trees) from development works and mitigation for identified impacts to these tree features are set out in **Appendix 12-7: Arboricultural Impact Assessment** of the ES [EN010142/APP/6.2]. The final level of arboricultural impacts and detailed measures for tree protection will be confirmed as part of an Arboricultural Method Statement secured by the **Framework Construction Environmental Management Plan (CEMP)** submitted alongside the DCO application [EN010142/APP/7.8].
- l. Each Sensitive Archaeological Site has been excluded from development and solar PV panels to preserve the archaeological remains. These areas are defined to include a sufficient buffer to avoid construction impacts to the buried archaeological remains or extant earthworks. Each Sensitive Archaeological Site is lined by fencing to prevent entry and accidental damage during construction, operation and decommissioning of the Scheme.

Impact Avoidance

- 6.3.5 Standard environmental best practice and mitigation will be implemented to ensure construction and operation of the Scheme complies with legislation relating to protected species. It will also aim to ensure the Scheme does not compromise the local conservation status of ecological receptors present within or in the vicinity of the Order limits.
- 6.3.6 The implementation of these measures has been taken into account when assessing the likely impacts and effects of the Scheme on landscape/visual and biodiversity features in **Chapter 9: Ecology and Nature Conservation** and **Chapter 12: Landscape and Visual Impact Assessment** of the ES [EN010142/APP/6.1].
- 6.3.7 During construction, the following provisions in respect of construction methodology, as set out in the **Framework CEMP** submitted alongside the DCO application [EN010142/APP/7.8] will be followed and adherence to which will be a Requirement of the DCO as set out in the **draft DCO** [EN010142/APP/3.1]:
- Designing the Scheme to comply with industry good practice and environmental protection legislation during both construction and operation e.g. prevention of surface and ground water pollution, fugitive dust management, noise prevention or amelioration;
 - Crossings of the River Trent and the majority of smaller watercourses to be undertaken using drilling, boring, micro-tunnelling or moling (i.e. trenchless) methods, with appropriate setbacks from the top of the banks (depending on habitats and other individual ecological constraints). However, there are some watercourse crossings that could require open cut installation techniques. Where intrusive crossing techniques are used, a pre-works hydro-morphological survey will be undertaken to record channel features and provide the baseline against which reinstatement will aim to provide an improved channel form between 5 and 10 m upstream and downstream of the open trench;
 - The perimeter security fence around the Scheme to be implemented early in the construction phase to secure the site to prevent construction activity in proximity to retained vegetation, in particular designated sites within and adjacent the Order limits and where required specific tree protection measures will be implemented, including solid hoarding fencing and construction exclusion zones;
 - Utilising motion detection security lighting throughout the Order limits to avoid permanent lighting and developing a sensitive lighting scheme ensuring inward distribution of light and avoiding light spill on to existing boundary features during the construction phase;
 - The ecological measures within the **Framework CEMP** [EN010142/APP/7.8] to be implemented by the selected construction contractor through detailed CEMP(s) and overseen by an Ecological Clerk of Works (EcoCoW), where required.
 - A Biosecurity Management Plan to be developed which sets out procedures to ensure any imported building/landscaping materials are

free from invasive non-native species (e.g. Schedule 9 species). In the event that any future infestations of invasive non-native species are identified during the development process, exclusion zones will be established around them and the ecology team contacted for advice as required.

- g. No works to be undertaken within 10m of watercourses which will mitigate for potential hazards such as chemical and soils spills into watercourses.
- h. Not undertaking in-channel works where invasive non-native species have been identified, to avoid the spread of invasive non-native species.
- i. Preparing mitigation strategies for protected species and, where required, applying for species licences from Natural England for translocation of animals away from construction areas sufficiently in advance of the works to meet with the optimum time for mitigation and to minimise any changes to the construction programme.
- j. Establishing reasonable avoidance measures along the Cable Route Corridor, including buffers of 30m around any identified Badger setts or trees with bat roost potential.
- k. Restoring post-construction any habitat removed from within the Cable Route Corridor.
- l. Tree protection measures and the final assessment of tree impacts will be developed as part of an Arboricultural Method Statement, as secured by the **Framework CEMP** submitted alongside the DCO application [EN010142/APP/7.8].

6.4 Updated Surveys

- 6.4.1 An ecologist will complete a Scheme walkover in advance of construction to reconfirm the ecological baseline conditions and to identify any new ecological risks. The walkover will be completed sufficiently far in advance of the construction to allow for the completion of any additional, seasonally constrained surveys (e.g. surveys in support of any identified requirements for protected species licences) that may be required. These surveys will be undertaken in advance of the detailed LEMP, which will be developed to reflect and incorporate the findings of these surveys.
- 6.4.2 Immediately prior to site clearance and start of construction of the Scheme, further site walkover surveys will be undertaken by an ecologist and landscape architect or arboriculturalist to confirm whether the risks associated with the Scheme remain as previously assessed and to confirm the correct impact avoidance measures are being implemented (e.g. tree protection fencing, protected species stand-offs and other protection measures) to manage those risks.
- 6.4.3 The scope of the required walkovers will be defined on a case-by-case basis, based on the specific risks associated with each relevant part of the Scheme and informed by the preceding ecological walkover described above.

- 6.4.4 Should any new constraints be identified because of the updated surveys, these would be captured in the final version of the LEMP. Any additional impact avoidance or mitigation requirements would be identified in consultation with the Applicant and/or the relevant statutory consultees. Implementation of these measures will be secured by a Requirement of the DCO, as set out in the **draft DCO [EN010142/APP/3.1]**.
- 6.4.5 Any additional surveys would be instructed as necessary by the ecologist or landscape architect, based on professional judgement and the findings of the updated walkover surveys, or identified as appropriate by the Applicant or their contractor(s). These may be required, for example, based on the construction programme, working requirements or following identification of specific issues and constraints not covered by previous advice.

6.5 Protected Species Licences

- 6.5.1 Whilst it is predicted that the Scheme can be delivered without the requirement for protected species licences, should the baseline ecological conditions change and a licence(s) be required, all necessary protected species licences would be applied for and obtained prior to undertaking any works that might result in offences under the relevant legislation.

6.6 Ecological Clerk of Works and Ecological Steering Group

- 6.6.1 The scope of the EcoCoW will be advised by the ecologist and landscape architect based on relevant environmental commitments, the findings of the updated surveys, protected species licensing requirements, and with reference to the relevant project programmes.
- 6.6.2 Relevant site staff will receive toolbox talks as necessary from the EcoCoW on the relevant ecological risks present, legal requirements, and the working requirements necessary to comply with legislation, and the final approved landscaping and biodiversity management and enhancement measures. Toolbox talks would be repeated as necessary over the duration of the works to ensure ongoing compliance with all relevant legislation and measures set out in the detailed LEMP.
- 6.6.3 The Applicant and/or the Appointed Contractor will invite representatives from key ecological stakeholders (statutory and non-statutory) to participate in an external committee or 'Ecological Steering Group'. The purpose of the Ecological Steering Group will be to receive updates from the EcoCoW on the progress of the Scheme in delivering the ecological mitigation and enhancement measures outlined within this document and to advise on successful delivery and refinement of mitigation and enhancement measures during their establishment. The formation of the Ecological Steering Group may provide opportunities for strategic collaboration with other solar projects within the region.
- 6.6.4 For a full list of avoidance and mitigation measures with regards to protected species, refer to the **Framework CEMP** submitted alongside the DCO application **[EN010142/APP/7.8]**.

6.7 Tree and Hedgerow Works

- 6.7.1 The location of the Scheme would largely avoid the need for the removal of mature trees across the Order limits. Some removal and pruning of mature trees may be required to facilitate vehicle access during construction, and for cable-related works.
- 6.7.2 Where works in close proximity to retained trees cannot be practicably avoided, these works would be undertaken in accordance with current best practice at the time of the works. As at March 2024, current best practice is defined in:
- British Standard (BS) 5837:2012 Trees in relation to design, demolition and construction – Recommendations (Ref-54); and
 - National Joint Utilities Group (NJUG) Volume 4 (2007) Guidelines for the Planning, Installation and Maintenance of Utility Apparatus in Proximity to Trees (Ref-55).
- 6.7.3 All necessary protective fencing would be installed prior to the commencement of any site clearance or construction works. This would be set out in Arboricultural Method Statements prepared pre-construction, pursuant to the DCO and secured by the **Framework CEMP [EN010142/APP/7.8]**.
- 6.7.4 Incursions into the canopy or Root Protection Area (RPA) of retained trees is limited to temporary access, passing places and bell mouth developments. Construction access will utilise existing hard surfaced access routes or where new access is required, will be achieved with ground protection to preserve tree roots and soil structure.
- 6.7.5 New electrical connections will be positioned to avoid the RPA of retained trees where possible and, where within an RPA, will be installed by hand (working around significant roots) or by trenchless techniques.
- 6.7.6 Soil structure for areas of new tree planting where the ground is currently unsurfaced will either be protected using ground protection or fenced exclusion zones; or the soil structure will be ameliorated or replaced following the completion of construction works.
- 6.7.7 The layout of the Scheme has been designed to minimise the loss of, and avoid significant impacts on, existing landscape features. Some hedgerows will be crossed by the Scheme and may need to be wholly or partially removed to facilitate construction works. Where hedgerows are removed along the Cable Route Corridor they will be re-instated upon completion of construction.
- 6.7.8 The final extent of tree loss will be determined by the Arboricultural Method Statement, secured by the **Framework CEMP** submitted alongside the DCO application **[EN010142/APP/7.8]**.

6.8 Precautionary Working Methods

- 6.8.1 The following precautionary working methods will be employed to minimise potential adverse effects on protected/notable species prior to and during

construction. Precautionary working method statements will be produced as necessary to specify working requirements and other necessary impact avoidance measures. These measures will be controlled and implemented through the detailed CEMP(s) that would be developed by the contractor. This will be secured by a Requirement of the DCO, as set out in the draft DCO [EN010142/APP/3.1].

Nesting Birds

- 6.8.2 Where practicable, vegetation clearance works will be undertaken outside the bird nesting season, which is typically between March and August inclusive. Where vegetation clearance works are required during the bird nesting season (i.e. between the months of March and August inclusive), these works can only proceed following the completion of a nesting bird check which will be undertaken by an experienced ornithologist. Vegetation clearance will not be undertaken where any active bird nest is identified, and all nests will be protected from harm until the nesting attempt is complete. This will require a buffer of vegetation to be left around the nest, the size of which will depend upon the species involved. Vegetation clearance can only proceed once the nesting attempt has been deemed, by a suitably qualified ornithologist, to have finished. Cleared ground would be maintained in a disturbed state in the run-up to construction, to minimise the risk of ground nesting birds attempting to nest on cleared ground.

Reptiles

- 6.8.3 Precautionary methods of working (PMW) to avoid accidental killing or injury of reptiles will be implemented during construction of the Scheme. PMW will include initial clearance of any vegetation that is potentially suitable as reptile habitat down to a height of approximately 30cm, followed by dismantling of any suitable features, such as log piles and tree stumps, under ecological supervision. Vegetation will be cleared to ground level once no risk of reptile presence remains. Vegetation within working areas will be kept short during construction to discourage reptiles from entering the Order limits.

Amphibians

- 6.8.4 PMW for amphibians, including Great Crested Newts, are similar to the ones outlined for reptiles above.
- 6.8.5 Where the presence of amphibians is anticipated due to potentially suitable habitat, consideration would be given to proceed with any minor vegetation clearance works and minor construction activities using PMW where appropriate.
- 6.8.6 In general, PMW would consist of encouraging any amphibians to move away from the construction footprint into adjacent areas, and discouraging / displacing any residual amphibians from the nearby area, using habitat manipulation. Habitat manipulation methodologies will vary between areas and seasons but will in general consist of a phased approach. To mitigate against harm to any residual amphibians that may be present, the following precautionary methods of working are deemed appropriate for the works within the areas of suitable great crested newt or other amphibian habitat:

- a. The on-site vegetation is cut short during winter (when amphibians are hibernating) if possible. If not possible (i.e. works during active season), the vegetation will be cut in a phased approach, firstly cutting to 30cm, then a cut to 15cm, then to ground level.
 - b. The vegetation should then be kept short to displace any present amphibians, which may be present, away from the works when they emerge in the early spring and discourage amphibians from moving into the Order limits from the surrounding habitat.
 - c. Vegetation (including topsoil) should be carefully removed using an excavator with a toothed bucket. These works should be supervised by an ecologist if this is deemed appropriate.
 - d. Any habitat features which may conceal sheltering amphibians (log piles, rubble mound bunds, any other debris etc.) will be dismantled by hand under supervision of the ecologist.
 - e. Dismantling of any rubble piles should be conducted during the amphibian active season (i.e. April to October) during warm weather conditions (i.e. above 5 degrees Celsius) to avoid killing or injuring potential hibernating amphibians.
- 6.8.7 In the unlikely event that any Great Crested Newts are discovered, works must cease immediately, and an ecologist must be consulted to determine how to proceed. If other amphibians are discovered during vegetation clearance it is proposed that these are translocated to suitable habitat nearby in suitable weather conditions.

Animal Welfare Requirements

- 6.8.8 Construction excavations have the potential to trap wildlife, such as badger, and result in offences under animal welfare legislation. This will be avoided through implementation of precautionary mitigation. All excavations deeper than 1m would be covered or fenced overnight, or where this is not practicable, a means of escape would be fitted (e.g. battered soil slope or scaffold plank), to provide an escape route should any animals stray into the construction site and fall into an excavation.

Biosecurity Management Plan

- 6.8.9 A Biosecurity Management Plan (BMP) will be prepared as an integral section of the LEMP based on the findings of the ecological surveys. The BMP will identify requirements for invasive plant management to achieve legislative compliance over the construction phase. There may be ongoing requirements to control invasive plant species during establishment of new habitats and soft landscape, or otherwise to address wider requirements for legislative compliance. A commitment for preparing a BMP prior to construction is also set out in the **Framework CEMP [EN010142/APP/7.8]**.
- 6.8.10 If necessary, the BMP will be updated to allow it to be rolled forward into the operational phase of the Scheme.

Lighting

- 6.8.11 Temporary construction lighting would be arranged so that glare is minimised outside the Order limits as far as reasonably practicable, via the use of best practice measures. Permanent lighting will be activated by motion detection avoiding operational light spill on areas outside the Order limits.

7. Proposed Green Infrastructure

7.1 Introduction

- 7.1.1 The Scheme has been designed to integrate with the local green infrastructure network, improving ecological and recreational connectivity across the Order limits. The post consent detailed design work will be refined through further site surveys, stakeholder and consultee feedback, and technical requirements of the design, and delivered within the parameters of the DCO.
- 7.1.2 A summary of the key principles and elements of the proposed green infrastructure is provided below. Detailed LEMP(s) will be developed post-consent and approved by the relevant local planning authority. Such plans will be required to be substantially in accordance with this Framework LEMP.

Permissive Paths

- 7.1.3 The locations of permissive paths are illustrated on the **Indicative Landscape Masterplan (Appendix A)**. Key principles and elements for Permissive Paths are:
- Provision of two north-south permissive paths which will provide amenity value for walkers, cyclists, and horse riders in an area where such routes are relatively limited. These permissive paths will be within 25 m wide corridors to allow the incorporation of habitats such as hedgerows that will screen the solar infrastructure, create new green infrastructure corridors and provide interest to users.
 - Creation of new areas for open public access. These would need to balance increased amenity value with the protection of habitats and species from disturbance.

Sensitive Archaeological Sites

- 7.1.4 Sensitive Archaeological Sites (SAS) are areas of archaeological preservation in which significant buried archaeological remains and/or surface earthworks have been identified during the baseline assessment and archaeological surveys undertaken for the Scheme and confirmed by trial trench evaluation. The locations of SAS are illustrated on the **Indicative Landscape Masterplan (Appendix A)**.
- 7.1.5 Each Sensitive Archaeological Site has been excluded from built development and solar PV panels to preserve the archaeological remains. These areas are defined to include a sufficient buffer to avoid construction impacts to the buried archaeological remains or extant earthworks.

- 7.1.6 These areas will be sown with a species-rich grassland mix to create a permanent grass cover and each of the SAS will be demarcated with fencing to prevent entry and accidental damage during construction, operation and decommissioning of the Scheme.

Biodiversity Zones

- 7.1.7 Biodiversity Zones (BZ) include a range of new habitats that will create, enhance and reinforce green infrastructure across the Principal Site, connecting the existing fragmented and isolated habitats, including woodland blocks both within and beyond the Order limits. These zones will contribute to the delivery of habitat creation and improved ecological networks in line with Central Lincolnshire's Biodiversity Opportunity Mapping. Many of these new habitats will be aimed at supporting ground-nesting birds, including semi-improved or tussock grassland and flower-rich meadows; but will also include linear belts, primarily along field boundaries, where both the number and diversity of native plants will be increased through woodland edge, scrub and hedgerow planting. These areas, alongside natural regeneration, will offer a diverse mosaic of habitats complementing the proposed native woodland. Site-specific conditions will inform the final choice of habitats and species; for example, wet grassland and ponds will be located within flood zones. The locations of BZ are illustrated on the **Indicative Landscape Masterplan (Appendix A)**. In areas targeted for ground-nesting birds, the security perimeter fencing will be free from mammal passes at the base. This will reduce the risk of predation of ground-nesting birds from mammal predators.
- 7.1.8 The following section provides a description of the proposed Woodland, Trees, Hedgerows, Grasslands, Aquatic and Riparian Habitats, and Other Habitat Provisions of which the BZ would be comprised.

Woodland, Trees and Hedgerows

- 7.1.9 Key principles and elements for Woodland, Trees and Hedgerows are:
- Management of existing woodland and trees to ensure longevity, increased species diversity, enhanced habitat value and greater resilience to climate change;
 - Management of existing hedgerows to ensure that biodiversity is the key benefit, whilst also increasing the level of screening from visual receptors. This will include gapping-up with a wider range of appropriate native species; and altering cutting regimes to benefit cover, shelter, food sources and breeding birds;
 - Re-instatement of hedgerows along the Cable Route Corridor will seek to increase the species diversity compared to that removed;
 - Any planting will be in accordance with National Grid guidelines for planting under or in the vicinity of overhead powerlines;
 - Planting of new woodland and shelter belts, in some cases as mitigation to help screen sensitive receptors and soften views, but also to provide increased structure, ecological connectivity and interest within the landscape. Species will be appropriate to the particular requirements of

the geographical area, but also take account of climate change and potential pest and pathogen threats. Where possible, woodland will include varied heights, spacing and species mix to maximise habitat diversity, with elements such as glades, rides and scalloped edges;

- f. Creation of scrub and associated mosaic habitats, some of which may be allowed to develop through natural regeneration. Such habitats offer valuable breeding bird habitats and can make substantial contributions to BNG;
- g. Scope for small orchards or the inclusion of edible fruit trees, including cultivars local to Lincolnshire or Nottinghamshire, particularly along public routes for 'foraging'. These will also provide pollination and food value; and
- h. New, individual roadside or hedgerow trees, including where these will replace prominent, mature ash specimens that are likely to succumb to dieback in the near future.

Grasslands

7.1.10 Key principles and elements for Grasslands are:

- a. New grassland seeding under the solar PV panel areas, providing an extensive habitat. These would likely be classed as 'modified' or 'semi-improved' grassland, reflecting the required management and level of shading provided by the panels. Such grassland is not regarded as a priority habitat, but would include wildflowers such as red clover, knapweed and birdsfoot trefoil, and would offer a greater species diversity than existing improved grassland or arable crops;
- b. New grassland outside panel areas and along rides, hedge margins or under power lines will likely be classed as 'species-rich grassland', with moderate species diversity. This is traditionally created through the use of proprietary seed mixes, with around 20% / 80% native wildflower / grass content, and up to around twenty species of the former;
- c. Larger areas of ecological mitigation outside panel/infrastructure areas will be seeded with species-rich neutral grassland mixes. It is anticipated that mixes similar to that described above, alongside supplementary yellow rattle to reduce grass competitiveness;
- d. Buffer zones of tussock grassland margins will be placed between areas of valued habitat and development to create transitional habitats;
- e. In all cases, local and genetically appropriate seed sources will be used where possible, with scope to engage with stakeholders to harvest 'green hay' from suitable donor sites, such as local SSSI or LWS (e.g. road verges) under Wildlife Trust control;
- f. Along crop margins, linear 5m strips of cover crop will be sown annually or biannually with a pollen/nectar rich seed mix, such as those recommended through Countryside Stewardship schemes; and
- g. Areas of open, low-cut grassland with limited cover will be required for ground nesting birds. A balance will therefore be required between the

provision of long grass, hedgerows and woodland; and more expansive grassland.

Aquatic and Riparian Habitats

7.1.11 Key principles and elements for Aquatic and Riparian Habitats are:

- a. Enhancements to existing watercourses, ponds and water bodies, including reduction of shading by scrub to increase light levels and plant growth.
- b. Prevention or removal of existing sources of pollution such as agricultural run-off and silt inputs, to improve water quality.
- c. Planting of appropriate marginal and aquatic plant species and implementation of management regimes that prioritise biodiversity and promote a wider range of habitats.
- d. Creation of new waterbodies and ponds, including as part of a wider drainage strategy and where these may be required as sources of water for fire emergencies.

Other Habitat Provisions

7.1.12 Key principles and elements for Other Habitat Provisions are:

- a. Installation of a range of artificial bird and bat boxes in existing woodland and trees, to increase the availability of nesting and roosting features and enhance their value as habitat for these species.
- b. Habitat piles and hibernacula will be in suitable areas using natural materials generated during site clearance, such as logs, turf, and grass strimmings. These would provide refuge and hibernation opportunities for amphibians and reptiles, as well as dead wood habitat for invertebrates, which would in turn benefit fauna such as bats and birds.

8. Management, Maintenance and Monitoring of Landscape and Biodiversity

8.1 Introduction

8.1.1 This section provides a high-level summary of how existing and proposed habitats will be protected or implemented during construction, maintained during the first five years following implementation, and managed in the long term up until and including decommissioning of the Scheme.

8.1.2 As the Scheme design progresses, further details will be provided, particularly in relation to plant species selection, specification of seed mixes, management prescriptions and timescales; and site-specific mitigation and enhancement elements. The locations of planting and enhancement (BZ) are shown on the Indicative Principal Site Layout Plan (**Figure 3-1 Indicative Principal Site Layout Plan** of the ES [EN010142/APP/6.3]). It should be noted that these locations are subject to further site survey and may include minor revisions, such as allowances for ditch maintenance or the presence of local services. The absence of any proposed planting in non-developable

areas does not preclude consideration of inclusion at the post-submission detailed design stage.

- 8.1.3 Larger, mature trees such as 'extra heavy standards' (14-16cm girth) are often specified in landscape schemes where more rapid screening is required, e.g. close to residential properties. However, larger trees carry more risk of failure due to transplant shock and the risk of drought, which has become more prevalent in recent years. These can be mitigated through appropriate maintenance including watering. However, smaller trees, including 'whips' and 'transplants' will often rapidly catch up with larger trees in height, whilst resulting in lower failure rates. Indicative supply heights are set out below, but final supply heights will be subject to site conditions and specific mitigation requirements and confirmed at the detailed design stage.
- 8.1.4 Implementation and monitoring works will be supervised by the Ecological and Landscape Clerk of Works as outlined in Section 9.
- 8.1.5 The handling of plants within the Order limits must be in accordance with National Plant Specification "Handling and Establishing Landscape Plants" (Ref-61).
- 8.1.6 All plants and planting operations are to comply with the requirements and recommendations of all current relevant British Standard specification including but not limited to:
 - a. BS 8545. Trees: From Nursery to Independence in the Landscape (Ref-57);
 - b. BS 3936-1:1992. Nursery stock. Specification for trees and shrubs (Ref-58);
 - c. BS 3882:2015 – Specification for Topsoil (Ref-63);
 - d. BS 8601:2013 British Standard Subsoil (Ref-64); and
 - e. BS 4428:1989. Code of practice for general landscape operations (excluding hard surfaces) (AMD 6784) (Ref-65).

8.2 Implementation

Existing retained trees and shrubs

- 8.2.1 During construction the retained hedgerows, woodland and trees will be protected. Measures to be employed will include the use of clearly defined stand-offs, managing the structure and integrity of the retained vegetation, and undertaking any pruning outside of the bird breeding season.
- 8.2.2 Retained trees will be periodically inspected by an arboriculturist during construction. Where construction works are adjacent to retained trees, works will be undertaken under a watching brief to record root loss and to recommend further arboricultural works where required.
- 8.2.3 Whilst no removals of trees subject to a Tree Preservation Order (TPO) are proposed, where an individual tree subject to a TPO must be removed (e.g. due to its dead or dangerous condition) and the local authority requires replacement, a new tree of equivalent species and ultimate size will be

planted in the same place or as near as reasonably practicable to the position of the removed tree, subject to operational requirements. Replacement planting for individual trees will utilise Standard tree stock (8-10cm girth) and will be planted in the next planting season following removal. The final species and planting location will be agreed in advance with the local authority. Any woodland or hedgerow planting would not require the use of Standard planting stock but would be achieved using whips or feathered whips.

Creation of Permissive Paths

- 8.2.4 The Scheme will implement new permissive routes during the lifetime of the Scheme as illustrated on the **Indicative Landscape Masterplan** in **Appendix A**, as follows:
- From Common Lane, at a point approximately 500 m west of Billyards Farm, continuing south to Kexby Road along the eastern edge of Big Wood; and
 - From Common Lane, at a point approximately 200 m east of Hermitage Low Farm, continuing south to join Northlands Road.
- 8.2.5 The routes will neither be surfaced or bound to retain the existing field character.

Native planting

- 8.2.6 Where possible, advance planting will be carried out in the first available planting season following the granting of the DCO for the Scheme. In instances where planting cannot be undertaken in this planting season, it would be undertaken at the beginning of the construction phase, or as soon as practicable once areas are no longer required for construction. Advance planting is likely to relate to Biodiversity Zones, woodland and hedgerow planting within the Principal Site.
- 8.2.7 Opportunities for advance planting as part of permitted preliminary works will be explored with landowners, ensuring that this is targeted to mitigate effects on the most sensitive receptors at the earliest opportunity, such as during the construction period.
- 8.2.8 Contract growing of stock by commercial nurseries may be beneficial for large areas of planting, to limit risks of poor quality and lack of stock availability. Stock of UK origin and local provenance will be preferred, although there may need to consider climate change adaptation through a more southerly provenance; and genetic variation as resilience to biosecurity threats.
- 8.2.9 Plants will be inspected at the nursery and on delivery, prior to planting. Plants will be protected from strimming damage and animals through guards, preferably biodegradable; although consideration will be given to avoiding excessive use of guards. Trees will be staked in line with industry standard specifications.
- 8.2.10 The ideal planting season for woody plants (trees, shrubs and hedge species) is November to March (preferably November or December) in soil

that is not frozen or waterlogged. New planting will be adequately protected from mammalian pests.

Native Hedgerow Planting

- 8.2.11 Hedge trenches will be dug 450 mm wide by 450 mm deep, the base of which will be broken up prior to returning backfill mixture. All in-season stock must be supplied bare root, and all out-of-season stock must be container grown. A specification for hedgerows will be developed based on the indicative species, sizes and percentages presented in **Table 8-1**.
- 8.2.12 All plants are to be supplied as bare root (BR) transplants, selected to 90cm tall, except *Ilex* (Holly) which is to be supplied as container-grown plants 30-40cm tall. All are to be planted in a double staggered row at 5 plants per linear metre.
- 8.2.13 The list provided in **Table 8-1** is not exhaustive and additional suitable species may be included. The percentage mix is indicative and will be amended to reflect particular growing conditions.

Table 8-1: Indicative mix for native hedgerows

Botanical Name	Common Name	Typical % Mix
<i>Prunus spinosa</i>	Blackthorn	5%
<i>Corylus avellana</i>	Hazel	20%
<i>Cornus sanguinea</i>	Dogwood	5%
<i>Crataegus monogyna</i>	Hawthorn	25%
<i>Crataegus laevigata</i>	Midland Hawthorn	5%
<i>Euonymus europaeus</i>	Spindle	5%
<i>Frangula alnus</i>	Alder Buckthorn	2.5%
<i>Ligustrum vulgare</i>	Wild privet	2.5%
<i>Rhamnus catharticus</i>	Buckthorn	2.5%
<i>Rosa canina</i>	Dog Rose	2.5%
<i>Rosa rubiginosa</i>	Sweet Briar	2.5%
<i>Sambucus nigra</i>	Elder	2.5%
<i>Ilex aquifolium</i>	Holly	10%

Botanical Name	Common Name	Typical % Mix
<i>Lonicera periclymenum</i>	Honeysuckle	2.5%
<i>Ulmus glabra</i>	Wych Elm	2.5%
<i>Viburnum opulus</i>	Guelder Rose	5%

Native Tree and Scrub Planting: General

- 8.2.14 Tree and scrub species will be selected from those listed in **Table 8-2**. The suitability of species for a particular location is indicated, although it should be noted that this is not prescriptive, nor is the list of species exhaustive.

Table 8-2: Indicative woodland/scrub species

Botanical Name	Common Name	General Suitability		
		Woodland	Woodland Edge and Scrub	Hedgerow Trees
<i>Acer campestre</i>	Field Maple	Y	Y	Y
<i>Alnus glutinosa</i>	Alder	Y		
<i>Betula pendula</i>	Silver Birch	Y	Y	
<i>Betula pubescens</i>	Downy Birch	Y	Y	
<i>Carpinus betulus</i>	Hornbeam	Y		Y
<i>Corylus avella</i>	Hazel		Y	Y
<i>Crataegus monogyna</i>	Hawthorn	Y	Y	Y
<i>Ilex aquifolium</i>	Holly	Y	Y	Y
<i>Malus sylvestris</i>	Crab Apple		Y	Y
<i>Populus nigra subsp. Betulifolia</i>	Black Poplar (native trees subject to availability)			Y
<i>Populus tremula</i>	Aspen	Y		
<i>Prunus padus</i>	Bird Cherry		Y	Y

Botanical Name	Common Name	General Suitability		
		Woodland	Woodland Edge and Scrub	Hedgerow Trees
<i>Prunus avium</i>	Sweet Cherry		Y	Y
<i>Quercus petraea</i>	Sessile Oak	Y		Y
<i>Quercus robur</i>	English Oak	Y		Y
<i>Salix caprea</i>	Grey Willow	Y	Y	
<i>Sorbus aucuparia</i>	Rowan		Y	Y
<i>Sorbus torminalis</i>	Wild Service Tree	Y		Y
<i>Tilia cordata</i>	Small-leaved Lime	Y		Y
<i>Tilia platyphyllos</i>	Large-leaved Lime	Y		Y
<i>T. x europaea</i>	Common Lime	Y		Y

Native Tree Planting: Woodland

- 8.2.15 Individual trees to woodland areas will be supplied as a range of sizes. The majority will be 60-80 cm height bare root seed-raised transplants, to ensure a low risk of failure and rapid height gain. These will be supplemented by 175-200mm bare root feathered specimens or, where there is a requirement for larger initial planting, Standard trees up to and including 12-14 cm girth (Heavy Standard) size. Heavy Standard trees vary in supply height between species but are generally around 3 to 3.5 m tall.
- 8.2.16 Woodland trees will be notch planted (transplants); in pits 750 mm diameter by 600 mm depth (feathered trees); or in pits up to 1 m diameter by 1 m depth (Heavy Standard). The base of the tree pits will be broken up to a depth of 200 mm and backfilled with topsoil consolidated in layers to allow the tree to be placed at the correct depth.
- 8.2.17 The typical spacing of trees for woodland planting will be between one tree every 2.5 m (1,600 trees per hectare) and one every 3 m (1,100 trees per hectare). In some locations where screening is not the primary requirement and/or there is an ecological benefit, wider spacings will be used to allow trees to develop a more defined structure and allow higher light levels for ground flora. Trees will be planted in staggered rows and locally with a degree of randomness to provide a more natural appearance.

Native Tree Planting: Woodland Edge and Scrub

- 8.2.18 Individual trees to the edges of woodland or areas of scrub will be supplied as 60-80 cm height bare root seed-raised transplants and 175-200mm bare root feathered specimens. The typical spacing of trees for scrub planting will be between one plant every 1 m (10,000 trees per hectare); and a maximum of one plant every 2.5 m (1,600 trees per hectare) for woodland edge. Plants will be located in staggered rows and locally with a degree of randomness to provide a more natural appearance.
- 8.2.19 Woodland edge and scrub plants will be notch planted (transplants) or in pits 750 mm diameter by 600 mm depth (feathered trees). The base of the tree pits will be broken up to a depth of 200 mm and backfilled with topsoil consolidated in layers to allow the tree to be placed at the correct depth.

Native Tree Planting: Hedgerow Trees

- 8.2.20 Individual trees will be supplied as 175-200mm bare root feathered plants. Where there is a requirement for larger initial planting, trees will be supplied as Standard form up to 12-14 cm (Heavy Standard) in girth. Trees will be planted along hedge lines in pits 750 mm diameter by 600 mm depth (feathered trees) or up to 1 m diameter x 1 m depth (Heavy Standard). The base of the tree pit will be broken up to a depth of 200 mm and backfilled with topsoil consolidated in layers to allow the tree to be placed at the correct depth.
- 8.2.21 The minimum distance between individual trees will be approximately 2 m to 3 m spacing where mitigation for visual effects is required.
- 8.2.22 Any trees planted in or alongside hedgerows will include a 1.5m tall white tipped marker post. This will allow locations of newly planted trees to be clearly visible to operators during maintenance periods.

Traditional Orchards

- 8.2.23 Orchard trees will supplement the native species noted above. Specific locations will be confirmed but these would be of most benefit close to PRoW and permissive paths. Cultivars with local provenance will be selected on vigorous rootstock and include top fruit species such as apple, pear, crab apple, plum, and nut species such as cobnut (hazelnuts). Examples include Herring's Pippin and Holland Pippin (apples); and Linsey Gage (a dessert gage). Trees will be selected as a mixture of half standard (120cm clear stem) or full standard trees (between 160 and 180cm clear stem).
- 8.2.24 Orchard trees shall be set in pits 900mm diameter by 900mm depth. The base of the tree pit will be broken up to a depth of 200mm and backfilled with topsoil consolidated in layers to allow the tree to be placed at the correct depth. Each full standard tree shall be planted a minimum of 7 m spacings and secured with stakes and ties. Half standard trees will be planted in blocks at no less than 5 m spacings.

Grassland

- 8.2.25 A mosaic of grassland types varying in species richness will be established across the Principal Site. Broadly the grassland mosaic will comprise:

- a. Semi-improved grassland of moderate species richness under PV solar panels and within the fence and solar panel areas;
 - b. Species rich grassland in areas of outside the Solar PV Areas, within ecological enhancement areas, PRoW buffers, and LWSs; and
 - c. Flower-rich grassland for pollinators and over wintering birds.
- 8.2.26 Where practicable, seed will be obtained from a local source for the purpose of maintaining continuity with local species-rich grasslands.
- 8.2.27 Receiving soils will be prepared to reduce nutrients where possible. This could include incorporating a substrate to reduce nutrient levels or removing/inverting topsoil to expose the sub-soil. Herbicide use can be beneficial but the risks of using across a large area will need to be considered. Details of the proposed surveys and assessments of soil conditions to be undertaken in order to determine appropriate techniques for grassland creation will be provided in the final LEMP. The results of these will be used to identify suitable species for proposed grasslands and habitats.
- 8.2.28 Once the nutrient level is reduced, all clods will be broken up and alien material (such as plastics and metals) above 50mm in size will be removed. The top 50mm of the soil will then be raked to prepare a fine tilth for the seedbed. The raking will occur immediately before sowing.
- 8.2.29 Seeding will be completed in either autumn or spring and only once the receiving soils have been tilled and adequately prepared.
- 8.2.30 Seeding and rolling will be carried out in dry weather and access will be prohibited to seeding areas until seed has germinated and a sward has established (see section 8.3 Establishment Management and Maintenance for grasslands generally).

Semi-improved Grassland

- 8.2.31 Semi-improved grassland of moderate species richness will be created within fence line of Solar PV Areas to increase species biodiversity, and which is also suitable for grazing. An indicative mix such as the mix outlined in **Table 8-3** will provide a self-sustaining, low maintenance mixture that brings environmental benefits and suitable for grazing, such as Aber Sustain by Germinal. However, this may be subject to change based on the needs of the site's biodiversity and prevailing soil types.

Table 8-3: Indicative species for semi-improved grassland

Botanical Name	Common Name	% Mix
<i>Trifolium repens</i>	Aberlasting (small) White Clover	5%
<i>Festuca rubra litoralis</i>	Abercharm Slender Creeping Red Fescue	20%
<i>Festuca ovina</i>	Aberfleece Sheeps Fescue	45%
<i>Agrostis capillaris</i>	Aberroyal Browntop Bentgrass	10%

Botanical Name	Common Name	% Mix
<i>Lolium perenne</i>	EG Resistus Perennial Ryegrass	20%

Species-rich Grassland

- 8.2.32 Species-rich grassland will be created to encourage development of a diverse sward of grasses and herbs for pollinators and birds including skylarks. An indicative mix such as the mix outlined in **Table 8-4** will provide a self-sustaining, low maintenance species-rich mixture that brings environmental benefits to pollinators and birds, whilst reinforcing positive landscape character features. However, this may be subject to change based on the needs of the site's biodiversity and prevailing soil types.

Table 8-4: Indicative species for species-rich grassland

Botanical Name	Common Name	% Mix
<i>Achillea Millefolium</i>	Yarrow	2.4%
<i>Centaurea nigra</i>	Common knapweed	2.0%
<i>Crucuata laevipes</i>	Crosswort	0.3%
<i>Daucus carota</i>	Wild carrot	0.2%
<i>Galium verum</i>	Lady's bedstraw	1.6%
<i>Geranium pratense</i>	Meadow cranesbill	0.3%
<i>Knautia arvensis</i>	Field Scabious	0.4%
<i>Lathyrus pratensis</i>	Meadow vetchling	0.4%
<i>Leucanthemum vulgare</i>	Oxeye Daisy	1.5%
<i>Lotus corniculatus</i>	Birdsfoot trefoil	0.2%
<i>Malva moschata</i>	Musk Mallow	3.5%
<i>Medicago lupulina</i>	Black Medic	0.1%
<i>Plantago lanceolata</i>	Ribwort Plantain	3.5%
<i>Ranunculus acris</i>	Meadow buttercup	1.5%
<i>Primula versis</i>	Cowslip	0.2%
<i>Rhinanthus minor</i>	Yellow Rattle	7.5%

Botanical Name	Common Name	% Mix
<i>Rumex acetosa</i>	Common Sorrel	0.35%
<i>Silene vulgaris</i>	Bladder Campion	0.1%
<i>Agrostis capillaris</i>	Common Bent	2.4%
<i>Anthoxanthum odoratum</i>	Sweet vernal-grass	2.0%
<i>Briza media</i>	Quaking grass	2.0%
<i>Cynosurus cristatus</i>	Crested Dogstail	62.4%
<i>Festuca rubra</i>	Red Fescue	10%
<i>Trisetum flavescens</i>	Yellow Oat-grass	1.2%

Flower-rich Meadow

- 8.2.33 The flower-rich meadow will provide increased species diversity and nectar-rich wildflowers for pollinators, beneficial insects, and farmland birds. The indicative mix, such as CSS1 Flower Rich Margin and Plots AB8 by Boston Seeds, may be subject to change based on the needs of the biodiversity and prevailing soil types at specific locations. The indicative mix is outlined in **Table 8-5** below.

Table 8-5: Indicative species for flower-rich meadow

Botanical Name	Common Name	% Mix
<i>Festuca rubra</i>	Strong Creeping Red Fescue	40%
<i>Festuca rubra commutata</i>	Chewings Fescue	25%
<i>Festuca trachyphylla</i>	Hard Fescue	15%
<i>Poa pratensis</i>	Smooth Stalk Meadow Grass	5%
<i>Onobrychis viciifolia</i>	Sainfoin	3.75%
<i>Vicia sativa</i>	Common Vetch	3.75%
<i>Trifolium incarnatum</i>	Crimson Clover	3%
<i>Trifolium pratense</i>	Red Clover	2.5%
<i>Lotus corniculatus</i>	Birdsfoot Trefoil	0.5%
<i>Plantago lanceolata</i>	Ribwort Plantain	0.5%
<i>Medicago sativa</i>	Lucerne	0.25%

Botanical Name	Common Name	% Mix
<i>Trifolium hybridum</i>	Alsike Clover	0.25%
<i>Achillea Millefolium</i>	Yarrow	0.25%
<i>Trifolium repens</i>	White Clover	0.25%

Tussock Grassland Margins as a Buffer

- 8.2.34 The tussocky margins will provide breeding and wintering habitat for a range of invertebrates which in turn provides a good food source for wintering and breeding birds. Furthermore, a habitat such as this can be tactically placed between valuable habitats and areas of development to create buffer zones which act as transitional habitats. This grassland is best placed in shady areas such as adjacent to woodland and/or scrub. An indicative mix, such as Tussock Mix by Habitat Aid, may be subject to change based on the needs of the biodiversity and prevailing soil types at specific locations. The indicative mix is outlined in **Table 8-6**.

Table 8-6: Indicative species for tussock grassland margins

Botanical Name	Common Name	% Mix
<i>Festuca ovina</i>	Sheep's Fescue	30%
<i>Festuca rubra juncea</i>	Red Fescue	30%
<i>Dactylis glomerata</i>	Cocksfoot	10%
<i>Deschampsia cespitosa</i>	Tufted Hairgrass	10%
<i>Phalaris arundinacea</i>	Reed Canary-grass	10%
<i>Plantago lanceolata</i>	Ribwort Plantain	3%
<i>Silene dioica</i>	Red Champion	2%
<i>Achillea millefolium</i>	Yarrow	1%
<i>Daucus Carota</i>	Wild Carrot	1%
<i>Galium mollugo</i>	Hedge Bedstraw	1%
<i>Leucanthemum vulgare</i>	Oxeye Daisy	1%
<i>Lotus corniculatus</i>	Birdsfoot Trefoil	1%

Sensitive Archaeological Sites

- 8.2.35 Sensitive Archaeological Sites grassland creation will be based on:
- Field ploughed by landowner prior to handover;
 - Light harrowing, either power or disc (see Table 8-7);

- c. Tine cultivation in spring, if necessary, to loosen the upper layers of soil;
- d. Rolling;
- e. Sowing with appropriate seed mix by drilling;
- f. Implement management regime; and
- g. If necessary, re-seeding bare patches.

Table 8-7: One off cultivation details for SAS grassland creation

Cultivation	Soil depth (cm)
Harrowing (power)	2.5-5
Harrowing (disc)	5-7.5
Tine cultivating in Spring	2.5-4
Rolling	Surface
Drilling	2.5

Aquatic Habitats and Waterbodies

- 8.2.36 Existing ponds and waterbodies in poor condition will be improved and restored where appropriate, with the aim of maximising their wildlife value. This will include de-silting to ensure that they remain at least partly wet during normal conditions, allowing amphibians and invertebrates to complete their life cycles.
- 8.2.37 Where existing water features are over-shaded by mature trees, these trees will be prioritised for re-pollarding, to increase light and decrease leaf fall onto the ponds. Scrub clearance and de-silting around ponds and water bodies will be phased over five years, to prevent the site-wide loss of existing shaded pond habitats and to provide ponds in various stages of natural succession to provide a wider range of niches for wildlife.
- 8.2.38 New waterbodies will be created in the BZ, with consideration given to existing flood zones and creating a landscape scale network of ponds and wetland areas. This will link in with proposed swales around BESS and substations, with their management seeking to maximising biodiversity value. As advised by the Millon Ponds Project (Ref-56), new ponds will be established in a 'pond complex' in order to create an aquatic habitat that will suit a variety of protected species. This involves creating several small, seasonal ponds (i.e. ponds with a depth of around 30cm that may dry up during summer) around a bigger, deeper pond (i.e. a pond with a depth of around 1-1.5m which will stay wet throughout the whole year).
- 8.2.39 To encourage the growth of native submerged plants, underwater bars and shoals will be placed at the bottom of the ponds as this keeps the area free of organic sediment build-up which can prevent these plants from growing (Ref-56).

- 8.2.40 The angles of the banks will be kept very broad and shallow (under 5° near the pond edge) and clay or sandy soil will be used to create south facing banks which can be seeded with mixes mentioned previously in the grassland descriptions (Ref-56).
- 8.2.41 A pre-works condition survey will be carried out to inform reinstatement of the channel at open cut watercourse crossings. Reinstatement will return instream vegetation from its temporary locations, and the banks of the watercourse replanted and reseeded. The area of bank reinstatement will be covered with hessian to encourage plant establishment and reduce the risk of soil erosion. The hessian will naturally degrade in-situ as the vegetation grows back.

Provision of Habitat Boxes

- 8.2.42 A total of at least 30 bird nest boxes and 20 bat roost boxes of varying types to suit different species of birds and bats will be installed in locations to be determined by an ecologist at the time of installation.
- 8.2.43 This will include barn owl boxes and hobby baskets, in suitable trees near to where these species have been recorded.
- 8.2.44 Bird and bat boxes made from long lasting materials (such as Woodcrete) will be used, where available and would be expected to have a life expectancy of 20–25 years. A minimum of five tree mounted or tower mounted barn owl boxes will be provided within the Solar PV Site.

Natural Regeneration Areas

- 8.2.45 Any areas subject to natural regeneration will not be subject to routine management, other than the creation of dead-wood piles. An annual inspection and survey may be carried out to record growth and development of the area. If required, litter, rubbish and debris will also be removed and mowing, and cutting will be used to manage scrub at the edge of the buffer.

Creation of Habitat Piles

- 8.2.46 Habitat piles and hibernacula will be constructed throughout the Solar PV Site in suitable areas, such as close to ponds or the newly created grassland areas. Habitat piles will be created using natural materials, generated during clearance of the Order limits, such as logs, brash, turf and grass strimmings.
- 8.2.47 These will provide refuge and hibernation opportunities for reptiles and amphibians, as well as dead wood habitat for invertebrates, which will in turn benefit fauna such as bats and birds.

8.3 Establishment Management and Maintenance

- 8.3.1 Detailed plans for the establishment and management of landscape and ecological elements will be agreed and implemented for the five-year post-planting (establishment) period, and the long-term maintenance period during the operation of the Scheme. This includes both newly created habitats and those re-instated following completion of construction. Key principles and prescriptions are outlined below.

- 8.3.2 For the duration of the Scheme, any plants and trees which are found to be dying, damaged or diseased following planting will be replaced with the same species and specification.

Native planting: Establishment

Native Hedgerows

- 8.3.3 All hedgerows will undergo a quarterly condition assessment during the five-year establishment period and an appropriate programme of works developed to address changes in condition and site requirements.
- 8.3.4 A 0.5m weed-free strip either side of hedgerows will be maintained through chemical and mechanical controls.
- 8.3.5 The first cut will be in spring to a level of 45-60cm above ground, taking care to exclude hedgerow trees.
- 8.3.6 A watering regime will be agreed through the contract process and implemented during times of drought.
- 8.3.7 Litter, rubbish and debris will be removed from planting areas throughout the year.
- 8.3.8 Guards, supports and plants will be checked annually in autumn and spring. Failed or defective plants will be recorded each autumn of the first 5-year (establishment) final LEMP period and replaced annually with the same species and size at the next available season. Thereafter the requirement for checking/replacement will be set out in the subsequent iteration of the final LEMP, as noted in the long-term management section below.
- 8.3.9 Hedges will be trimmed in November or December during the fifth maintenance year, to promote bushy growth.
- 8.3.10 Failed or defective plants will be checked and recorded in September annually.
- 8.3.11 Any failed or defective plants will be replaced with matching species of the same size during the next planting season after failure.
- 8.3.12 Dead, dying or diseased planting will be subject to removal where they are considered dangerous on health and safety grounds or as a result of their state of health fail to fulfil the intended mitigation function, and in accordance with any protected species constraints. In such circumstances the removed planting will be replaced with the same specification of planting (species and size) except in the event that it is deemed that the plants are failing due to local conditions or prevailing issues with disease for example. In such circumstances the landscape architect would specify an alternative specification of native species that is better able or suited to the conditions observed on site and fulfils the same function as those species removed, both in terms of their ecological, landscape and visual function and benefit. Such species would then be managed in line with the first 5 years of establishment set out in this document.

Native Woodland, Shrub with Trees, Woodland Edges and Traditional Orchard

- 8.3.13 All trees, woodland planting plots and scrub will undergo a quarterly condition assessment during the five year establishment period and an appropriate programme of works developed to address changes in condition and site requirements.
- 8.3.14 A 1m weed-free circle around trees will be maintained through chemical and mechanical controls.
- 8.3.15 A watering regime will be agreed through the contract process and implemented during times of drought.
- 8.3.16 Litter, rubbish and debris will be removed from planting areas throughout the year.
- 8.3.17 Guards, supports and plants will be checked annually in autumn and spring. Failed or defective plants will be recorded each autumn and replaced annually with the same species and size at the next available season.
- 8.3.18 Scrub plants will be trimmed in November or December during the fifth maintenance year, to promote bushy growth.
- 8.3.19 Failed or defective plants will be recorded each autumn of the first 5-year (establishment) final LEMP period and replaced annually with the same species and size at the next available season. Thereafter the requirement for checking/replacement will be set out in the subsequent iteration of the final LEMP, as noted in the long-term management section below.
- 8.3.20 Dead, dying or diseased planting will be subject to removal where they are considered dangerous on health and safety grounds or as a result of their state of health fail to fulfil the intended mitigation function, and in accordance with any protected species constraints. In such circumstances the removed planting will be replaced with the same specification of planting (species and size) except in the event that it is deemed that the plants are failing due to local conditions or prevailing issues with disease for example. In such circumstances the landscape architect would specify an alternative specification of native species that is better able or suited to the conditions observed on site and fulfils the same function as those species removed, both in terms of their ecological, landscape and visual function and benefit. Such species would then be managed in line with the first 5 years of establishment set out in this document.

Native planting: long-term management

Native Hedgerows

- 8.3.21 Hedgerows will be managed on a three-year rotation with only one side of the hedgerow cut in any one year to help develop the hedgerow structure. They will be maintained at a height of between 2.5m and 3.5m for the duration of the Scheme. Individual trees within the hedgerow will be allowed to grow naturally.

- 8.3.22 Hedgerows will be enhanced through less regular mechanical cutting, for example, every 2-3 years and on rotation (either by rotating which hedgerows are cut or cutting each side of the hedgerow on rotation) to create bushy and naturalistic hedgerows suitable for wildlife and visual screening. Cutting should be carried out across one third of the hedgerows on each site per year over a 3 year cycle. Each of the rotational cuts to be undertaken along clear and logical sections of hedgerows to ensure that the rotational cutting itself does not appear incongruous in the landscape. An example might include one full hedge line along a section of road, avoiding visual contrast if only half the full section of hedgerow is cut in any one year.
- 8.3.23 Cutting will be carried out at the end of the winter in February, thereby retaining berries through the winter months for wildlife and avoiding the bird breeding season.
- 8.3.24 If hedgerows are managed by traditional techniques such as laying, this will be carried out on a rotational basis to retain the structural integrity of hedgerows and maintain connections with other habitats.
- 8.3.25 Dead, over-mature or dying hedgerow trees will be subject to removal where they are considered dangerous on health and safety grounds, and in accordance with any protected species constraints.
- 8.3.26 Monitoring of hedgerows will be undertaken to detect any significant changes in plant health and condition.
- 8.3.27 The requirement for checking/replacement of failed or defective plants will be set out in the subsequent iteration of the final LEMP.

Native Woodland, Shrub with Trees and Woodland Edges

- 8.3.28 Individual trees will be managed according to best arboricultural practice in accordance with BS8545:2014 Trees: from nursery to independence in the landscape (Ref-57); BS3998:2010 Tree Work – Recommendations; and woodlands (Ref-58) as per the UK Forest Standard (2023) (Ref-59).
- 8.3.29 Woodland creation will be guided by Forest Research's Ecological Site Classification model.
- 8.3.30 From year 5 onwards, guards, ties and stakes will be removed from plants where established and where browsing and/or bark stripping risk is low.
- 8.3.31 Between years 7 and 10, planted areas will be reviewed and thinned out as necessary to remove any poor or weak specimens, which will facilitate other specimens to flourish and provide space for trees and shrubs to further establish.
- 8.3.32 The requirement for checking/replacement of failed or defective plants will be set out in the subsequent iteration of the final LEMP.
- 8.3.33 The understorey of woodland, woodland buffers and native tree belts will be coppiced in stages to minimise disturbance to wildlife, as required, as part of good woodland management.

- 8.3.34 Rides (where present) are to be managed on cyclical cutting regime, forming a suitable ecotone facilitating variable light regimes into open habitat including some areas of full sun.
- 8.3.35 Woodland edges are to be managed to provide graded heights to minimise edge effect, including the establishment of suitable species (such as shrubs and minor trees) as appropriate.
- 8.3.36 Arisings from thinning or other woodland or scrub management functions will be retained on-site in the form of dedicated brash and wood piles or wind-rows, for the benefit for fungi, lichen, and invertebrates, with a target density of 20m³ per hectare.
- 8.3.37 Trees posing a risk to health and safety will be subject to removal where they are considered dangerous, in accordance with any protected species constraints.

Traditional Orchard

- 8.3.38 An appropriate programme of works will be developed to address changes in condition and site requirements, including appropriate prescriptions from Year 5 onwards. Further to this:
- From year 5 onwards, guards, ties and stakes will be removed from plants; and
 - Orchards will be underplanted with species-rich grass seed mix suitable for optional grazing.

Grassland: establishment

- 8.3.39 A detailed plan for the establishment and management of species-rich grassland and conservation margins will be developed for the five-year establishment period. The aim will be to encourage development of a diverse sward of grasses and herbs. This may require the use of mowing and / or grazing regimes. Establishment maintenance will be based on the following principles and outline prescriptions:
- Immediately after sowing, the ground will be left undisturbed and un-watered to allow the grassland to establish naturally.
 - Visual inspections will be made during the growing season.
 - Once established, grazing (where feasible) will be undertaken on a rotational or zoned approach, with potential for mob grazing (short duration, high density) within compartments.
 - Where grazing is not possible, mowing will be the alternative option. This will depend on the type of grassland and intending outcomes but is likely to include a single cut and collect during mid-August to late September. If grasses dominate, then an early mow to mimic the 'spring bite' graze in March or very early April will be followed by the second September cut. The majority of grassland away from the access routes will be around 30 to 45cm high at the highest point, during summer.
 - Arisings will be raked into piles and left in situ for seven days before collection and removal to an off-site green waste composting facility.

- f. Control of undesirable species (e.g. arable weeds) and injurious weeds including ragwort will be undertaken to prevent colonisation and domination of the grassland through the use of additional cuts during the growing season or if essential, a selective herbicide.
- g. A 5m wide track around the periphery of the PV panels will be mown to maintain service access to the panels.
- h. Botanical surveys will be carried out in late spring to confirm that the establishment species-rich grassland and conservation margins have been successful in achieving their intended aims and objectives.
- i. Spot checks will be undertaken at locations within each grassland area by a suitably qualified ecologist during years 2, 4 and 6, the purpose being to record plant species, their distribution, and the overall condition of the grassland in line with Conditions Assessments following Biodiversity Net Gain methodologies. Other relevant indicators relating to the sward that may require remedial action during the contract period or in the future will also be recorded.
- j. If remedial action is required, the EcoCoW will agree action with suitably qualified ecologist and areas identified will be re-seeded.

Grassland: long-term management

- 8.3.40 The long-term management of species-rich grassland will be undertaken to maintain a relatively stable grassland community in the long-term, and to avoid areas naturally progressing into tall, dense, grass-dominated spaces. In contrast, for cover crop margins, long term management relies on disturbance and re-seeding.
- 8.3.41 Measures for species-rich grassland and conservation margins will focus on a regime of:
- a. Grazing or mowing, as described above, with arisings from the latter removed off-site.
 - b. Grassland to visibility splays will be maintained at a height of no more than 0.26m where necessary, with less frequent management to allow a taller and more diverse sward at the back of the verges behind the required visibility splays.
 - c. Control of undesirable species (e.g. arable weeds) and injurious weeds to prevent colonisation and domination of the grassland using a selective herbicide.
 - d. Meadow margins adjacent to woodland and hedgerows may be left for a year or more between cuts to provide dense ground level cover for fauna, including amphibians, small mammals, and invertebrates.
 - e. For conservation / cover margins, if ground nesting birds are absent, plots may be scarified or 50% cut between mid-June and mid-July. Arisings will be raked into piles and left in situ for seven days before collection and removal to an off-site green waste composting facility. Plots will be re-sown every two to three years.

- f. Condition Assessments following Biodiversity Net Gain methodologies will be undertaken at years 10, 15, 20, 25 and 30. The results of these monitoring surveys will be used to adjust the management regime to maximise biodiversity and achieve the projected Biodiversity Net Gain unit values.

Sensitive Archaeological Sites

8.3.42 The short-term management (0-5 years) would involve:

- a. Visual inspections during the growing season, looking at establishment rates and whether certain species are at risk of outcompeting the grassland.
- b. Grassland mown between two and four times at even intervals throughout the growing season to control the more competitive species and allow the newly sown less competitive species to establish (up to and including Year 3).
- c. Grassland cut in autumn (Years 4 and 5 and once grassland has set seed) with cut grass left in situ for 24hrs.
- d. A check for ground nesting birds to precede all mowing which would inform where and when mowing could be carried out.
- e. Removal of cut vegetation from the grassland area (in combination with a litter pick) with disposed of cuttings (arisings) elsewhere on the site, e.g. to create compost heaps that could be used by reptiles, or taken off-site as hay.
- f. Targeted weeding to deal with invasive and unwanted plants undertaken as necessary.

8.3.43 Once the sward is established (Year 5+), low intensity sheep grazing would be of benefit in maintaining the grassland where practicable.

8.3.44 Glyphosate herbicide would be used to deal with any weedy growth. It is:

- a. non-selective;
- b. non-residual;
- c. becomes inactivated on contact with soil; and
- d. harmless to ground nesting birds (adults and juveniles).

8.3.45 As a rule of thumb, the minimum ground disturbance requirements for managing grassland, such as mowing or removal of scrub, are that it is undertaken after the end of August and before the end of February. This enables management to go ahead with no risk to nesting birds and likewise for amphibians and reptiles. This also applies to human disturbance, e.g. archaeologists and, or public accessing heritage location.

8.3.46 Where biodiversity constraints in terms of heritage off-set areas pose a problem in terms of the heritage management, an EcoCow should undertake a survey to determine if there is a real conflict. For example, where mowing needs to be undertaken in August, the grassland can be checked for ground nesting birds. If none is present, mowing can go ahead.

8.3.47 This approach would apply to other biodiversity features, e.g. ponds and reptiles.

8.3.48 It is important to remember that the biodiversity value of the grassland will change over time, the plan being for it to increase in value. This does not affect minimum ground disturbance requirements, it is mentioned more in terms of managing expectation in relation to heritage off-set areas.

Aquatic habitats and waterbodies: establishment

8.3.49 The growth of planted, seeded and naturally colonising aquatic plants and any adjacent grassland planting will need to be controlled and managed to maintain the habitat diversity during the establishment period. A detailed plan for the establishment and management of any planting, as well as any vegetation clearance and trees works (such as pollarding) will be developed for the five-year establishment maintenance period. This will be determined through monitoring of the ponds through annual site inspections to identify requirements for any remedial action.

Aquatic habitats and waterbodies: long-term management

8.3.50 The long-term management of naturally colonising aquatic plants and any adjacent grassland planting will be undertaken to manage the ponds at various stages of succession to maintain a relatively stable and diverse wetland community in the long-term, and to avoid areas becoming dominated by one to two species.

8.3.51 The management prescriptions outlined below are considered appropriate and effective for the Scheme, but will be adapted as required following findings of annual site inspections and condition monitoring reports:

- a. Remove all litter, rubbish and foreign debris and remove from site.
- b. Carry out rotational management of the marginal plants with the selective removal of the most dominant marginal planting to ensure the intended species diversity is retained. Works to be carried out in October.
- c. Scrub clearance and tree works to reduce shading should be carried out on an annual basis, in line with the recommendations provided for native planting outlined above.
- d. Prohibit excessive and extensive spread of plants once planting is established. Remove spreading plants as required in October.
- e. Monitor silt depth and if required remove silt material if it is considered to be detrimental to the function of the pond. All material should be left at the edge of the channel over night before being removed off site or to an agreed area offsite so any aquatic fauna can migrate back to the feature. This should be carried out annually in November to December.
- f. Bank erosion should be monitored and any erosion should be reported, and mitigation should be provided.

- g. A minimum of 5m width buffer strip either side of ditches, and 10m either side of rivers, will be left unmanaged (apart from the ecological management practices recommended within this document) following the establishment of grassland to allow natural vegetation growth within the riparian zone.
- h. Following the reinstatement of in-channel habitats at open cut watercourse crossings and temporary watercourse culvert locations, vegetation will be left unmanaged (apart from the ecological management practices recommended within this document) within the channel to allow natural growth.

Provision of habitat boxes

Bird / Barn Owl Boxes

- 8.3.52 All wild birds, their active nests and eggs are protected under the Wildlife and Countryside Act 1981, as amended (Ref-5). This makes it an offence to deliberately or recklessly kill or injure any wild bird or damage or destroy any active nest or eggs of a wild bird.
- 8.3.53 Annual cleaning of bird boxes cannot be undertaken between the months of March and August inclusive, when birds may be using the boxes. Therefore, bird boxes will be cleaned between October and February to prevent the build-up of nest parasites in the boxes whilst avoiding the risk of disturbing birds using the boxes as a roost site during the cold winter months.
- 8.3.54 Barn owl boxes will be inspected annually between November and December by a suitably licensed ecologist. Where barn owls are absent any nesting material of other species (such as accumulations of sticks) will be removed where required, after ensuring the nest is empty.

Bat Boxes

- 8.3.55 Bat boxes will be inspected by an appropriately licensed bat surveyor for evidence of uptake as per the post-construction monitoring programme (see timing in Section 4), and any evidence of roosting bats will be recorded to assist with ongoing management of the woodland on-site.
- 8.3.56 Where monitoring is not undertaken as outlined above, the condition of all wildlife boxes installed will be monitored annually during the operation of the Scheme and replacements will be made as necessary. Inspections can be timed to coincide with the required inspections of new tree and shrub plantings.
- 8.3.57 Bat boxes are, in most circumstances, unlikely to be used by hibernating bats during winter months (between November and February inclusive). Therefore, any maintenance that is required on bat boxes should be undertaken during these months, when any bird nests will be removed, after ensuring they are not in use. All bats and their roosts are protected under the Wildlife and Countryside Act 1981, as amended (Ref-5). Therefore, it is an offence to possess, control, transport, sell or exchange any live or dead bat. Therefore, if bats are inadvertently discovered during maintenance, the person undertaking the maintenance should leave the box undisturbed.

Management and Maintenance of Permissive Paths

- 8.3.58 Permissive paths will be provided to allow recreational access for walkers, horse-riders and cyclists. These will be located within 25 m wide corridors to allow space for habitat creation such as hedgerows and grassland, which will provide screening, visual interest and ecological value.
- 8.3.59 Maintenance will be required to ensure safe passage of all users during the operation of the Scheme. This will include mowing, hedge cutting, removal of potential obstructions and repairs to any fences, gates and signage, where appropriate.

8.4 Post Construction Monitoring

- 8.4.1 Monitoring will be required to determine that the functions documented within this Framework LEMP and then formalised in the final LEMP are being achieved and whether any remedial management action may be required. The baseline, against which the effects arising from the actions derived from the monitoring can be compared, will comprise the pre-construction survey data. This data, collected in 2022 and 2023, will require updating prior to construction, as by operation (from 2028) this data will be over three years old and therefore out-of-date (Ref-60). Updates would include a similar set of surveys undertaken at the baseline where relevant ecological receptors have been identified, including surveys of breeding and non-breeding birds, bat activity and badgers.
- 8.4.2 A post-construction monitoring programme will be formalised and agreed as part of the DCO Application and included within the detailed LEMP. Walkover surveys of the Order limits will be undertaken between April and June in years 2, 4, 6, 10, 15, 20, 25 and 30. The surveys will involve an inspection of the woodland, hedgerows, grassland, and wetland habitats to ensure that they are being managed accordingly. Data will be recorded in line with Condition Assessments following Biodiversity Net Gain methodologies, to ensure the projected Biodiversity Net Gain unit values are achieved.
- 8.4.3 Post-construction monitoring for flora, birds (breeding and non-breeding), riparian mammals, badgers, bats (bat box roosting and activity survey), great crested newt and reptiles (presence/absence) will be undertaken in the respective seasons, in years 1, 3, 5 and 10 post-construction. This is likely to involve similar or scaled-down methods to the baseline surveys to enable cross-comparison with baseline data, to assess any changes in biodiversity as a result of the Scheme. This may include use of bat static detectors, breeding bird surveys, targeted reptile surveys in enhanced habitats and great crested newt presence/absence surveys of restored ponds.
- 8.4.4 An annual maintenance check of wildlife boxes (bats, birds and barn owl) would be made each winter to ensure that all boxes are still in position and secure. Some refitting of boxes, repairs and replacements are likely to be required over the life of the Scheme.
- 8.4.5 Results from the post-construction monitoring will feed into the LEMP and, if required, management methods may be amended accordingly based on this monitoring.

9. Roles and Responsibilities

9.1 The Applicant and/or the Appointed Contractor(s)

- 9.1.1 The Applicant and their appointed contractor(s), and their appointed Ecologist (the EcoCoW) and Landscape Clerk of Works (LCoW), would be responsible for:
- a. Correct instruction of all parties contributing to delivery of the final approved LEMP (including but not restricted to the Applicant's staff and their appointed ecologists, landscape architects, landscape contractors, construction contractors and management organisations) based upon the principles stated within the Framework LEMP;
 - b. Keeping the appointed ecologist/landscape architect/arboriculturist informed of work activities that require support and supervision, so that it is clear when attendance is required;
 - c. Enacting/enforcing recommendations made by the ecologist/landscape architect/arboriculturist, or otherwise agreeing an appropriate alternative course of action, if it is subsequently determined that previous advice is not practicable or is out of date; and
 - d. Keeping a record of measures taken to deliver the requirements of the final LEMP, to provide an auditable record of compliance.

9.2 The Appointed Ecologist (EcoCoW)

- 9.2.1 The EcoCoW will be responsible for:
- a. Advising the Applicant and the appointed contractor(s) on ecological matters and requirements for compliance with relevant legislation and protected species licences, providing support as instructed, and monitoring compliance with the final approved LEMP;
 - b. Reviewing the LEMP at appropriate intervals and revising management requirements as necessary for the following five year period and subsequently for the duration of the LEMP;
 - c. Where a European Protected Species Mitigation Licence (EPSML) has been granted it is the responsibility of the 'Named Ecologist' and licence holder or otherwise appointed ecologists to ensure the compliance of the licence and working activities associated with the agreed licence; and
 - d. Providing the Applicant and the appointed contractor(s) with survey reports and other written evidence required in accordance with the agreed scope of work and contractual obligations.
 - e. Provide regular updates to the Ecological Steering Group on the delivery of ecological mitigation and enhancement measures during the establishment of these mitigation and enhancement measures.

9.3 The Appointed Landscape Architect (LCoW)/Arboriculturist

9.3.1 The appointed LCoW/arboriculturist will be responsible for:

- a. Providing specialist site supervision in the form of walkover surveys to relevant landscape areas. This would be to assess landscape components and their condition and identify the need for landscape enhancement as instructed and in accordance with the agreed scope of work and contractual obligations, once the Scheme is operational;
- b. Monitoring and assessing the landscape related elements of the approved LEMP for their effectiveness on a quarterly basis for the five years following commencement of operation of the Scheme (the establishment period), and then subsequently (as the final LEMP) for the duration of the Scheme at a minimum of 2 visits per year until year 10 and then a minimum of 1 visits per year until the end of the operational life of the Scheme;
- c. Ensuring that the landscape related elements of the approved LEMP are reviewed at the end of the five-year establishment monitoring and assessment period and amended accordingly for the subsequent duration of the Plan. The LEMP shall be amended accordingly to suit any changing landscape conditions and ultimately inform the maintenance operations throughout the operational life of the Scheme; and
- d. Ensuring that any reviews associated with landscape related elements of the approved LEMP clearly identify any changes to site conditions and circumstances, whether the aims and objectives of the approved LEMP are being met, and where identified changes are needed to existing management practices and timeframes.

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Appendix A Indicative Landscape Masterplan

[Refer to the Indicative Landscape Masterplan provided within AS-064 on the Examination Library]