



Tween Bridge Solar Farm

A Nationally Significant Infrastructure Project in the Energy Sector

Preliminary Environmental Information Report

Technical Appendix 7.11 – Outline Landscape Ecological Management Plan

March 2025



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Outline Landscape and Ecological Management Plan



Tween Bridge Solar Farm
March 2025



**Tyler
Grange**

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Section 1: Introduction and Site Context

Introduction

- 1.1. This outline Landscape and Ecological Management Plan (LEMP) has been prepared by Tyler Grange Group Ltd on behalf of RWE in respect of 'Tween Bridge Solar Farm' and accompanies the submission of a Preliminary Environmental Information Report (PEIR), which is produced to inform the Statutory Consultation of The Scheme. It must be read alongside the accompanying PEIR chapter for full context. For the purposes of this report, the extent of the Scheme is referred to as the 'Draft Order Limits', which includes all areas proposed for solar panels, ecological mitigation areas and associated infrastructure.
- 1.2. The intention of this document is to provide the principles of habitat management measures for retained and created habitats associated with the proposed project, which are separated into:
 - Retained woodland;
 - Retained hedgerows;
 - Retained ditches/watercourses;
 - Created grassland beneath solar arrays;
 - Created landscape screening;
 - Created bird mitigation areas;
- 1.3. Enhancement measures are also proposed regarding herptiles, roosting bats and nesting birds.
- 1.4. This LEMP is informed by a suite of ecological survey work, which has identified the presence of protected/notable sites, habitats and species both within and adjacent to the Draft Order Limits, all of which will need a degree of protection and mitigation during the site's construction. The following section of this Plan summarises the baseline context regarding ecological receptors within the Zone of Influence of the site.
- 1.5. The LEMP is the mechanism for delivery of mitigation of impacts identified in the PIER during the operational phase, and the enhancements proposed. This LEMP is in outline only and a detailed LEMP will be produced following consultation with relevant bodies including the local authorities and Natural England.
- 1.6. A Construction and Environmental Management Plan (CEMP) will be produced to detail the construction phase mitigation required.



Coverage

- 1.7. This LEMP sets out details of initial habitat interventions and subsequent long-term management of habitats and is set out as follows:
- **Section 2** describes the Draft Order Limits including baseline ecological/ground conditions;
 - **Section 3** sets out management objectives for the LEMP and describes ecological/ground constraints to be factored into the proposed management prescriptions;
 - **Section 4** describes the management prescriptions to achieve objectives set out in **Section 3** as well as setting out monitoring and remedial actions where necessary;
 - **Section 5** describes the monitoring programme over the lifetime of the development, along with indications of mechanisms for remedial measures; and
 - **Section 6** describes who will be responsible for implementing the plan and how arrangements for funding will be organised.
- 1.8. For the purposes of this report, Year 0 is defined as the year of the initial habitat interventions and Year 1 refers to the following year/planting season. Given the large size of the DOL, it is expected that the Scheme would be delivered in phases i.e. not all habitat would be created within the same year. It is therefore proposed that management of habitats would commence in the year of completion of all habitat creation.
- 1.9. Implementation of the plan will be iterative in the management prescriptions and will be refined as necessary based on the condition of the site and outcomes following the first cycle of the implemented management and ongoing monitoring.



Section 2: Site and Habitat Creation Summary

Site Context

- 2.1. The Draft Order Limits consist of c.2000ha of agricultural land, approximately 94% of which consists of arable farmland with cereal and non-cereal crops. Fields are bounded by watercourses as well as fences, hedgerows and tree lines. Modified grassland used for pastoral gland is also present within the Draft Order Limits as well as a woodland copse and a number of ponds.
- 2.2. The Tween Bridge Wind Farm is located within the Draft Order Limits, and consists of twenty-two operational wind turbines. The Stainforth and Kneadby Canal crosses the Draft Order Limit from west to east.
- 2.3. In the wider context, the Draft Order Limits is surrounded by extensive areas of farmland and areas of woodland, with areas of lowland peat bog (Thorne & Hatfield Moors) located to the north and south of the Draft Order Limits.

Site Baseline

- 2.4. The Draft Order Limits are dominated by arable land in use as cereal crops, with some areas of modified grassland and tall ruderal vegetation. All of these habitats are of intrinsic negligible ecological importance in their own right and do not require any specific considerations regarding protection during the construction phase. They are known, however, to support protected/notable species, which are discussed in the relevant sections of this report.
- 2.5. Other habitats of local importance, some of which are also identified as Habitats of Principal Importance (HoPI) under the Natural Environment and Rural Communities Act (NERC) Act 2006, are also present within the DOL, comprising scrub, hedgerows (HoPI), lines of trees, ponds (HoPI), ditches and woodland (HoPI).
- 2.6. **Table 1** below summarises the baseline ecological and ground conditions of the site, all of which have been factored into the feasibility and scope of the management objectives and principles proposed.

Statutory/Non-Statutory Sites	<p>A small area of Thorne & Hatfield Moors Special Protection Area (SPA), Thorne Moor Special Area of Conservation (SAC), Thorne, Crowle and Goole Moors Site of Special Scientific Interest (SSSI) and Hatfield Chase Ditches SSSI lie within the DOL. The Humber Estuary SPA/SAC/Ramsar sites approximately 6km to the northeast of the DOL.</p> <p>Of particular relevance to these sites is the designation of Thorne and Hatfield Moors SPA for its breeding population of nightjar,</p>
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	<p>which has been identified as a principle objective of this management plan (Objective 2).</p> <p>A number of non-statutory Local Wildlife Sites (LWS) are also present within the DOL, associated with the ditch network and woodland copses.</p>
Protected and Notable Species	<p>Survey work has confirmed the presence of the following protected/notable species within the DOL:</p> <ul style="list-style-type: none"> • Ground-nesting bird species (most notably skylark); • Farmland bird species associated with agricultural landscapes; • Non-breeding bird species associated with Humber Estuary SPA (most notably lapwing, pink-footed goose, greylag goose and golden plover); • Non-breeding farmland bird species; • Water vole; • Badger; • Small mammals (brown hare, hedgehog); • Some notable invertebrates; <p>Although not confirmed, the DOL may also support amphibians and reptiles (collectively referred to as herptiles for the remainder of this report).</p>
Invasive Species	<p>Water fern and rhododendron have been recorded within the DOL associated with ditches and pockets of woodland.</p>
Baseline Habitats	<p>The DOL is dominated by arable land separated by an extensive ditch network. Hedgerows and woodland copses are also present throughout the DOL.</p>
Public Access	<p>Public access is limited around the DOL, and is mainly restricted to the towpath of the Stainforth & Keadby Canal.</p>
Topography	<p>The DOL is generally flat so there are no management restrictions or considerations to this regard.</p>
Current Use	<p>The land across the DOL is in use for arable crop production.</p>
Landscape Character	<p>The DOL is located entirely within NCA 39 – Humberhead Levels, one of the key features of which is floodplains, washlands and traditionally grazed alluvial flood meadows, which give rise to important wetland habitats.</p>
Strategic Location	<p>The DOL is not identified within any strategically beneficial location (i.e. one identified within any Local Plan for biodiversity),</p>



	although it is situated between two Special Protection Areas designated for bog habitat.
Irreplaceable Habitats	There are no irreplaceable habitats within the DOL, although the adjacent lowland raised bog associated with the moors is considered irreplaceable. There would be no impacts on such habitat.

Table 1 – Site Baseline Summary



Section 3: Management Objectives and Biodiversity Net Gain

Management Considerations

- 3.1. There are no specific ground conditions or designations which would mandate a particular type of management, other than the acknowledgement of the likely presence of protected/notable species. Of particular note is the requirement for habitat creation with the specific purpose of providing suitable habitat for both ground-nesting breeding birds and non-breeding bird species over winter and on passage.

Management Objectives

- 3.2. Considering the habitats and key fauna present within the Draft Order Limits, the following objectives for nature conservation management have been set:
- Objective 1: To provide open areas of permanent pasture specifically managed for the benefit of ground-nesting bird species and non-breeding bird species over winter and on passage;
 - Objective 2: To provide permanent areas or arable land managed for the benefit of ground-nesting bird species such as nesting and foraging skylark, and non-breeding bird species over winter and on passage, specifically pink-footed geese;
 - Objective 3: To provide strengthened green corridors along field boundary features, specifically for the benefit of nightjar;
 - Objective 4: To enhance quality of existing woodland habitat;
 - Objective 5: To enhance quality of ditch network;
 - Objective 6: To monitor the efficiency of nature conservation management through regular assessment of habitat establishment; and
 - Objective 7: To enhance the value of the land within the DOL for roosting bats and nesting birds through the installation and continued care of bat and bird boxes on retained trees.

Biodiversity Net Gain

- 3.3. It is not yet a mandatory requirement for NSIP applications to demonstrate a quantifiable biodiversity net gain (BNG) of at least 10% under the Environment Act 2021. However, the Applicant intends to provide evidence of the deliverability of measurable BNG as part of the final submitted ES Chapter, in accordance with NERC obligations and the Overarching



National Policy Statement for Energy (EN-1) and National Policy Statement for Renewable Energy Infrastructure (EN-3).

- 3.4. Given the limited land take associated with solar developments and low distinctiveness of the arable habitat across much of the site, it is expected that the Scheme will be able to deliver beyond 10% biodiversity net gain in habitat, hedgerow and watercourse units within the DOL and without the need to procure any off-site habitat creation.



Section 4: Management Prescriptions

- 4.1. An outline of the broad habitat types proposed for creation and management prescriptions for the Scheme are set out in **Table 4.1** within the subsequent pages of this section of the report. The management will be implemented in stages, as indicated in the timings column in accordance with the management task, as will the appropriate timing of required habitat maintenance once established.
- 4.2. The prescriptions seek to cover a period equating to a 30-year period and include both the start-up works and continued management post intervention. This is inclusive of primary establishment of habitats and subsequent management regimes. These actions are set out under the individual objective headings set out in Section 3.



Habitat	Rationale for Feature Creation/Management	Species Mix	Management Tasks
Grassland mixture beneath and around solar arrays	To create a relatively species-diverse meadow grassland	Emorsgate EM1 General Purpose Meadow Mixture (or equivalent) Forbs (10%): yarrow, knapweed, oxeye daisy, musk mallow, ribwort plantain, salad burnet, meadow buttercup, wild carrot Grasses (90%): common bent (9%), crested dogtail (31.50%), red fescue (27%), smaller cat's-tail (4.50%), smooth-stalked meadow-grass (18%)	<u>Preparation</u> Prior to sowing the seed mix, the ground will need to be prepared by cultivation whereby weeds will be removed by hand or spot treated with herbicide. Following this the soil will then be harrowed or raked to provide a medium tilth then rolled. <u>Sowing</u> The seed mix will be sown in Autumn or Spring in accordance with the manufacturer's specifications at a density of 4g/m ² / 40kg/ha. Care will be taken to ensure the seeds are not covered but are 'firmed' in and have good contact with the soil. <u>Ongoing management</u> Once established, the grassland will be managed via sheep grazing at appropriate densities. Where possible, rotation of grazing will be employed whereby not all of the DOL is subject to grazing at the same time, thus allowing some areas to remain ungrazed at sensitive times of year (i.e. bird nesting season, flowering season) so such areas can realise their full biodiversity potential.
Grassland mixture in proposed bird mitigation areas	To create a diverse, tussocky grassland specifically managed for ground-nesting birds and non-breeding birds over winter and on passage	An example grass mixture is Emorsgate EM1 or EM2. This will provide suitable breeding habitat for ground-nesting farmland birds and foraging/roosting/loafing habitat for non-breeding birds (primarily geese, lapwing and golden plover). Subject to topography, consideration will also be given to the creation of	<u>Preparation</u> Prior to sowing the seed mix, the ground will need to be prepared by cultivation whereby weeds will be removed by hand or spot treated with herbicide. Following this the soil will then be harrowed or raked to provide a medium tilth then rolled. <u>Sowing</u> The seed mix will be sown in Autumn or Spring in accordance with the manufacturer's specifications at a density of 4g/m ² / 40kg/ha. Care will be taken to ensure



		<p>shallow scrapes (in consultation with engineering/attenuation requirements) in these areas which can be designed to function as either a permanently marshy grassland (Emorsgate EM8), or ephemeral pools. Both of these habitats will be suitable as mitigation for both breeding and non-breeding birds. It would also be preferable to work with the topography of the land and create ground which is not completely flat. This will introduce a natural variation in the cutting height of the grass, leaving some areas longer and some areas possibly scalped, creating areas of bare ground which will ultimately allow new grass growth to develop.</p> <p>These interventions would introduce more botanically diverse grassland and provide the wetland mosaics in strategic locations, particularly along the central canal corridor.</p>	<p>the seeds are not covered but are 'firmed' in and have good contact with the soil.</p> <p>It is proposed that the initial ground preparation and sowing of seed mix will take place in the season before the main construction activity commences, to ensure that favourable bird habitat is available for birds to relocate to once construction activity commences.</p> <p><u>Traditional Hay Management</u> This would comprise bi-annual cuts, with the first cut to 15cm undertaken in late summer after the core breeding season for ground-nesting farmland birds. The arisings would need to be removed from the area following the cut to allow new growth. A second cut should then be taken to 5cm in Autumn (no later than September), at the time when non-breeding birds will be arriving on passage, and kept like this until the beginning of March.</p> <p>This can be achieved with low density cattle or infrequent cuts/topping, and arisings removed. It is important to ensure the grass is kept at this height going into breeding season, to ensure that the grass is short enough for wading birds such as golden plover and lapwing to access the soil for foraging.</p> <p>From March and during the breeding season, approximately 50% of the grassland should be less than 5cm in height to benefit early-season nesters such as skylark and lapwing, and approximately 25% of the grassland should be cut between 5cm and 15cm, and the remainder left long.</p> <p>It is also of benefit that the parcels of proposed bird mitigation are separate, to allow a rotational management practice to be adopted, so not 'all' parcels are managed/disturbed at the same time, allowing birds the ability to retain access to suitable habitat at all times.</p>
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<p>Arable management</p>	<p>To maintain arable habitat managed for ground-nesting birds such as nesting and foraging skylark, and non-breeding birds over winter and on passage, including pink-footed geese.</p>	<p>Rotational arable management</p>	<ul style="list-style-type: none"> ○ Use sugar beet where possible. ○ Use other appropriate crops on rotation when sugar beet is not being grown, such as winter cereal crops, oil seed rape, post-harvest cereal stubbles, potatoes¹. ○ Post-harvest, the fields should be left until the spring before ploughing to maximise the foraging resource, with the geese foraging on roots chopped into fragments by the harvester, as well as unharvested roots. ○ Avoidance of deep ploughing. ○ Incorporation of a ley crop within the management rotation. ○ Inclusion of permanent grass margins to the fields measuring a minimum 2 metres.
<p>Landscape screening</p>	<p>To provide native species-diverse screening where necessary</p>	<p>To be confirmed, but expected to comprise a mixture of native scrub/tree species, including berry-producing species to benefit over-wintering birds.</p>	<p><u>Planting</u> Trees/scrub whips planted over winter when they have better drought tolerance.</p> <p><u>Ongoing management</u> Once mature and failed stock removed where necessary, management should comprise occasional pruning in late January/early February as necessary, to avoid the bird nesting season and to also allow berry-producing species to fruit and allow over-wintering birds (most notably thrushes) access to foraging resources.</p>

¹ <https://www.rspb.org.uk/birds-and-wildlife/pink-footed-geese>



Retained hedgerows	To maintain and, where possible, improve quality of hedgerows around DOL	N/A	Management of existing hedgerows will comprise rotational cutting in late January/February to allow berry producing plants the chance to fruit and offer over-wintering resources for farmland birds, particularly redwing and fieldfare.
Retained woodland	To maintain and, where possible, improve quality of woodland around DOL, including removal/control of invasive non-native species (rhododendron)	N/A	Rhododendron will be removed in Year 1, and thereafter monitored and controlled for the duration of the site's management. Ongoing management will comprise regular woodland health checks to ensure that any failed (or failing) stock is removed, along with ongoing control of woodland flora to maintain ground vegetation within limits i.e. control of bramble.
Retained ditches	To maintain and, where possible, improve quality of ditches around DOL	N/A	Many of the ditches within the site are under the control and management of the Internal Drainage Board (IDB), who have standard internal management procedures to ensure that each ditch is functioning as intended. The following measures therefore apply to all non-IDB ditches or, where agreed with the IDB as a stakeholder, IDB ditches too. Prior to any enhancement works commencing, the ditches will be assessed for their quality in terms of macrophyte cover, shading, undesirable species etc. and other criteria, as directed/identified by the Statutory Biodiversity Metric (SBM) River MoRPH condition criteria, as ditches vary in their quality, structure and scope for enhancement across the site. Where scrub encroachment is identified as a limiting factor, the initial management measures will comprise selective scrub removal to allow greater light into the ditch and encourage a more diverse aquatic fauna. Macrophyte cover can also be supplemented through the enhancement of ditch banks by plug-planting with



			<p>specialist wetland plants (i.e. common reed), where this is relevant.</p> <p>Ongoing management will then comprise continued scrub control, sensitive dredging works and rotational management to ensure that entire lengths of ditch are affected at the same time.</p>
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Section 5: Faunal Enhancements

- 5.1. In addition to the habitat interventions set out above, the following enhancement measures are proposed across the site to provide enhancements for certain faunal groups:
- 5 barn owl nest boxes installed on suitable mature trees, micro-sited by a suitably experienced ecologist;
 - 5 kestrel nest boxes installed on woodland edge/mature hedgerow trees;
 - 90 small nest boxes comprising a mixture of open-fronted and hole-fronted nest boxes, with the latter targeted at 40mm in diameter to target starling;
 - 100 bat boxes on retained mature trees;
 - 100 hedgehog boxes;
 - 100 insect hotels, comprising underground bee shelters and general-purpose insect hotels made from natural materials (i.e. brash);
 - Inclusion of 100 beetle banks;
 - Inclusion of 50 bee hives.;
 - 50 amphibian/reptile refugia, designed in line with English Nature's (now Natural England) mitigation guidelines, whereby refugia are made from brash/rubble/grass cuttings.
- 5.2. The locations of the enhancement features will be presented as part of a 'final' management plan, taking account of *all* survey data (i.e. including those surveys proposed in 2025) to ensure that the positioning of enhancement features is optimised based on the known distribution of species within the DOL.



Section 6: Monitoring

- 6.1. Along with the requirement for ongoing management of the operational site by specialist contractors, it will also be necessary for the site to be periodically monitored by a Suitably Qualified Ecologist (SQE) to ensure the habitats are in the appropriate condition and are either showing signs of success in the management objectives put forward (i.e. between Years 1 and 5) and later with evidence that the habitats have achieved their target condition under the SBM.
- 6.2. Key Performance Indicators (KPIs) of each habitat will be its score against the condition criteria within the SBM.
- 6.3. It is recommended that monitoring of the site commences in Year 1 following habitat interventions. As discussed in this note, it is expected that the development will be phased over a period of time and across several planting/growing seasons. For this reason, monitoring will commence in the year following the completion of *all* proposed habitat interventions.
- 6.4. Monitoring will then be required in Years 2, 3, 5, 10, 15, 20 and 30 post-creation. The appointed SQE will perform a Habitat Condition Assessment of the habitats to assess their progress against management objectives and BNG condition criteria. Should the habitats appear to be failing or in 'Poor' condition, it will be the responsibility of the SQE to report this to the landowner. It will then be the responsibility of the landowner and their appointed contractors to implement the necessary remedial measures. The results of the monitoring in Years 2, 3, 5, 10, 15, 20 and 30 will be compiled in reports for submission to the Local Planning Authorities.
- 6.5. However, the SBM does not assess habitat quality against faunal assemblages, or any specifically targeted habitat intended for faunal enhancements/mitigation. To this end, a suite of monitoring surveys are recommended to monitor the value of the site for specific faunal groups during the operational phase of the development. The below list provides an outline of the suggested monitoring of the site from a faunal perspective. Such data will also be beneficial to feed into ongoing research projects which aim to understand the impacts of solar farms on wildlife, and the effectiveness of associated mitigation.
 - Breeding bird surveys of bird mitigation areas, comprising 6 visits in optimal season (April – June) – the surveys should be repeated every year for the first 10 years of the site's management. These surveys will also focus on the use of the DOL by nightjar;
 - Non-breeding bird surveys comprising vantage point watches/counts of bird mitigation areas between September and March, repeated for the first 10 years of the site's management, including nocturnal visits;



Section 7: Delivery of the LEMP

- 7.1. The site operator will be the body responsible for the delivery of this LEMP. It will be the responsibility of the site operator and their appointed contractors to deliver the practical measures detailed in the final plan i.e. ground preparation, sowing and ongoing management. It will be the site operator's overall responsibility to ensure the prescriptions detailed in any future management plan are delivered, and any remedial actions arranged and delivered.
- 7.2. An SQE will need to be appointed to undertake the required monitoring measures in Years 1, 2, 3, 5, 10, 15, 20 and 30. The SQE will then be responsible, through funding by the site operator, to undertake the monitoring and report discrepancies to the site operator along with compiling the results of the monitoring for submission to the Local Planning Authority.





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