Triton Knoll Offshore Wind Farm Limited
Triton Knoll Electrical System

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Appendix 27: Landscape Strategy and Ecological Management Plan (Revision B)

Date: 05 January 2016

Appendix 27 of the Applicant's response to Deadline 4

RWE The energy to lead

Statkraft

TRITON KNOLL

Triton Knoll Offshore Wind Farm Limited
Triton Knoll Electrical System

Outline Landscape Strategy and Ecological Management Plan (Revision B)

January 2016

Application Document: 8.8

Pursuant to APFP Regulation 5(2)(q)

Triton Knoll Offshore Wind Farm Limited

Triton Knoll Electrical System

Outline Landscape Strategy and Ecological Management Plan (Revision B)

Application Document: 8.8

January 2016

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1 SUMMARY

1.1 This document is an Outline Landscape and Ecological Management Plan (LSEMP) prepared for the onshore component of the Triton Knoll Electrical System (TKES). It presents the proposed approach to ecological and landscape mitigation for the onshore elements of the proposed TKES. It provides outline details of pre-construction ecology surveys which will be required post consent to update the ecological baseline and inform the final mitigation plan. It also provides details of the ecological mitigation works and mitigation requirements for landscape and visual impacts likely to be required during the construction and operational phases of the Development. It has been prepared in support of the Terrestrial Ecology Environmental Statement (ES) Chapter (Volume 3, Chapter 4) and Landscape and Visual ES Chapter of the (Volume 3, Chapter 2) .

2 INTRODUCTION

Overview

2.1 Triton Knoll Offshore Wind Farm Limited (TKOWFL) is submitting an application to the Planning Inspectorate (PINS), on behalf of the Secretary of State for Energy and Climate Change, for a Development Consent Order (DCO) for the Triton Knoll Electrical System (the proposed development) under the Planning Act 2008. The Triton Knoll Electrical System (TKES) would connect the consented Triton Knoll Offshore Wind Farm (TKOWF) offshore array to the existing National Grid substation at Bicker Fen, Boston.

2.2 The TKOWF offshore array is located approximately 33km (20.5 miles) east of the Lincolnshire coast. The Secretary of State granted a DCO for the TKOWF offshore array on 12th July 2013.

2.3 All terms, acronyms and abbreviations used within this document are explained on first use, and / or set out in full within the Glossary appearing in the Environmental Statement (ES).

The Applicant

2.4 TKOWFL is a joint venture between two leading international energy companies; RWE Innogy UK Limited and Statkraft UK Limited. RWE Innogy UK is the UK subsidiary of the German renewable energy company RWE Innogy (part of RWE AG), a company with a strong and diversified position in renewable energy development. Statkraft UK Limited is the UK subsidiary of Statkraft Group, Europe's largest generator of renewable energy and the leading power company in Norway.

Project Overview

2.5 The components of the TKES, which are needed to connect TKOWF to the National Grid, comprise:

- Up to six offshore export cable circuits – to transmit the high voltage alternating current (HVAC) electricity from the offshore substations to the transition joint bays at the landfall;
- Landfall infrastructure just north of Anderby Creek, Lincolnshire – including transition joint bays which house the connection between the offshore cables and the onshore cables;
- Up to six onshore export cable circuits (up to 220 kV) – to transmit the HVAC electricity from the transition joint bays at the landfall to the

proposed Triton Knoll Substation via the Intermediate Electrical Compound;

- An Intermediate Electrical Compound near to Orby Marsh – to provide compensation for reactive power to allow more efficient transmission to minimise losses;
- A substation near the existing Bicker Fen National Grid Substation – to step-up the voltage to the voltage used by the National Grid and provide additional compensation for reactive power built up over the export transmission;
- Up to four onshore export cable circuits (400 kV) – to transmit the electricity from the proposed Triton Knoll Substation to the existing National Grid substation at Bicker Fen, Boston; and
- Unlicensed Works[1] within the existing National Grid Bicker Fen substation compound comprising up to two new 'bays' of electrical equipment required to connect the Electrical System to the National Grid.

2.6 The onshore Proposed Development Boundary (PDB) for the TKES is shown on the Works Plans – Application Document 2.2 and Figure 1.2 of the Onshore Project Description chapter - Volume 3, Chapter 1.

2.7 The offshore PDB for the Triton Knoll Electrical System is shown on the Works Plans – Application Document 2.2 and Figure 1.2 of the Offshore Project Description ES Chapter – Volume 2, Chapter 1.

2.8 The other works at the existing National Grid Bicker Fen substation near that are required to connect the power produced by the TKOWF offshore array into the National Grid (the 'Enabling Works') will be consented, constructed and operated by National Grid. National Grid has not yet completed the engineering studies necessary to define the Enabling Works required at their existing Bicker Fen substation. However, it is anticipated that these works will only involve additions to the existing infrastructure within the existing site boundary.

[1] "Unlicenced works" are electrical works needed to connect Triton Knoll to the National Grid substation at Bicker Fen that National Grid is not required pursuant to its transmission licence to carry out itself.

Purpose of this Outline Landscape Strategy and Ecological Management Plan

2.9 This Outline Landscape Strategy and Ecological Management Plan (LSEMP) forms part of the application for a DCO for the TKES (Application Document 8.8). This document presents the proposed approach to ecological and landscape mitigation for the onshore elements of the proposed TKES, within the onshore PDB.

Scope of this Outline Landscape Strategy and Ecological Management Plan

2.10 Section 3 of this document provides a summary of the terrestrial ecology baseline conditions, as determined by desk study and field survey undertaken to inform the 'Terrestrial Ecology' Chapter (Volume 3, Chapter 4) of the ES. Section 4 provides a summary of the impacts of the development on ecological features. Section 0 provides outline details of pre-construction surveys which will be required post consent to update the ecological baseline and inform the final mitigation plan. Section 6 provides detail of the ecological mitigation works likely to be required during the construction and operational phases of the Development; and Section 7 outlines the mitigation requirements for landscape and visual impacts.

2.11 The scope of the baseline surveys undertaken for Terrestrial Ecology have been discussed with Natural England (see TKES Application EIA Evidence Plan – Application Document 8.16) and agreed to be adequate to determine the impacts of the Project on ecological features. This draft of the Outline LSEMP has been provided to Natural England for consultation prior to final submission.

2.12 The design-development process has run in parallel with the assessment of the Project, and has sought to avoid direct impacts on existing landscape and ecological features (such as ponds, badger setts, woodlands, field boundaries, designated sites for nature conservation, notable tree specimens and trees with potential for roosting bats) where possible. This has been achieved by cable route alterations and the use of trenchless crossing techniques (including horizontal directional drilling (HDD), micro-bore and pipe jacking) for the installation of the cable ducts under sensitive features. These measures are referred to as 'embedded mitigation' within this document and ES chapters. Further information on trenchless crossing techniques can be found in Volume 3, Chapter 1 Onshore Project Description in the TKES ES. The ameliorating effects of embedded mitigation were taken

into account when the impacts of the development on ecological and landscape features were assessed in the ES chapters.

2.13 Where it has not been possible to achieve avoidance, a combination of appropriate construction techniques, habitat reinstatement and a planting scheme have been developed as an integral part (embedded mitigation) of the overall design of the proposals.

2.14 Additional 'applied mitigation' seeks to address any potentially significant ecological, landscape and visual impacts identified within the assessment process. A summary of the Development impacts on terrestrial ecology is given in Section 4.

2.15 Land access was not available for all areas within the PDB at the time that surveys to establish the terrestrial ecology baseline were undertaken. More information is provided on this within the Statement of Reasons (Application Document 4.1). However, broad habitat descriptions for areas that could not be visited on the ground were established by examination of aerial photography. These areas have been prescribed for further habitat and species surveys at the pre-construction stage as described in Section 0. Pre-construction surveys will also be undertaken for ecological features that may have changed status since the baseline surveys were undertaken e.g. badger setts and trees with bat potential.

2.16 The project landscape architects and ecologists have worked together to ensure an integrated approach to the landscape and ecological mitigation and to determine the appropriate protection and restoration of landscape features and habitats. Details of 'embedded' and 'applied' mitigation measures are given in Section 6.

2.17 Further details regarding construction methodologies and mitigation designed to minimise impacts on Lincolnshire Coastal Grazing Marsh (LCGM) are provided in the Lincolnshire Coastal Grazing Marsh construction methodologies which are included within the Outline Construction Method Statement (CMS) (Application Document 8.7.1), appended to the Outline Code of Construction Practice (CoCP) (Application Document 8.7). This annex should be read in combination with this document for details regarding LCGM habitat.

2.18 For the purposes of the DCO submission, the level of detail provided within this document is appropriate with regards to mitigation, i.e. an outline set of landscape and ecological mitigation proposals which set out the principles of mitigation and respond to identified significant ecological; and landscape and visual effects. It is likely that following the issue of the DCO, a more detailed level of information will be provided, within an 'Ecological and Landscape

Mitigation Plan,' and within a 'Written Landscaping Scheme' which responds to the detail provided in the scheme design at that stage and Requirements 6 and 13 of the draft DCO.

2.19 The PDB, refers to the total area of land within which the onshore works will be located. For the purposes of this document, when the 'site' is referred to, this refers to the area within the PDB. Specific reference will be made to the Above Ground Electrical Infrastructure (AGEI) parts of each of the Intermediate Electrical Compound (IEC) and Substation sites. The AGEI part of each site would contain the visible, above-ground components of the operational development which have the potential to give rise to significant effects which require consideration in the mitigation strategy. Specific reference will also be made to the cable route area, which will be referred to separately, and is generally a 60 m wide corridor within which the cables will be located.

2.20 Further information on construction methodologies designed to minimise impacts on terrestrial ecology is also given in the Outline CoCP (Application Document 8.7) and the Outline CMS (Application Document 8.7.1) which is appended to the Outline CoCP.

3 ECOLOGICAL BASELINE

Baseline Annex

3.1 The baseline annex (Annex 4-1 'Ecology Surveys Report' of Volume 3 Chapter 4 'Terrestrial Ecology') gives a detailed description of the ecological baseline existing within the PDB, as determined by desk studies and field survey, and should be read in conjunction with this Outline LSEMP. A summary of the ecological baseline is given below.

3.2 Natural England has acknowledged the limitations and constraints associated with the baseline surveys and are satisfied with the scope of the surveys undertaken to inform the baseline (see TKES Application EIA Evidence Plan – Application Document 8.16).

Baseline Data Sources

3.3 The baseline studies comprised information from the following sources:

- Details regarding statutory and non-statutory designated sites for nature conservation and records of protected and notable faunal and floral species found within the study area from the Greater Lincolnshire Nature Partnership (GLNP);
- Details on bird species recorded within the study area from The Lincolnshire Bird Club (LBC);
- Extended Phase 1 habitat survey to record and map ecological habitats on the site;
- Great crested newt survey;
- Reptile survey;
- Breeding and wintering bird survey;
- Bat activity survey;
- Otter survey;
- Water vole survey; and
- Badger survey.

Summary of the Ecological Baseline

3.4 Following completion of desk and field studies ecological features were assigned a nature conservation importance evaluation based on the relevant

Chartered Institute of Ecology and Environmental Management (CIEEM) EIA guidelines.

3.5 The conservation value, or potential value of an ecological resource or feature is determined within a geographical context using the CIEEM geographic scale which attributes features to the following geographic criteria:

- International (e.g. Species listed on Schedule 2 of Conservation of Habitats and Species Regulations 2010 (the Habitats Regulations))
- UK (e.g. Species listed in Schedule 5 of the Wildlife and Countryside Act 1981 (WCA));
- National (e.g. Habitats and Species of Principal Importance (S41Natural Environment and Communities Act 2006 (NERC));
- Regional;
- County (e.g. Lincolnshire BAP Species and Habitats);
- District;
- Local or Parish; and
- Within the Zone Of Influence (ZOI) only.

3.6 For this assessment, the ZOI is considered to be the area occupied by the Development Area.

3.7 The criteria for evaluation are based on the CIEEM guidelines and Ratcliffe (1977) and include primary criteria of native status, rarity, level of threat and proportion of total, and secondary criteria of history of presence, links to other populations, cultural appeal and economic importance.

3.8 A summary of the ecological baseline determined from specific surveys and desk study is given in the following paragraphs with the determined level of nature conservation importance.

Ecological Desk Study

3.9 The desk study revealed no statutory designated sites within the PDB.

3.10 Three non-statutory Local Wildlife Sites (LWS) were found within the PDB. These are shown in Figures 4.1a, c and f of the ES Terrestrial Ecology ES Chapter (Volume 3, Chapter 4) and include:

- Huttoft Bank Dunes LWS
- Old River Lymn LWS
- South Forty Foot Drain LWS

3.11 These were determined to be of nature conservation value at the county level.

3.12 Three Sites of Special Scientific Interest (SSSI) and 38 non-designated sites were located within 2 km of the cable route and 5 km of the Substation and Intermediate Electrical Compound.

Extended Phase 1 Habitat Survey

3.13 An extended phase 1 habitat survey was conducted of all areas within the PDB where land access was available. Where it was not possible to gain land access an aerial photography survey was undertaken and supported by ground-truthing; totalling approximately 50% of the area within the PDB.

3.14 Plant species lists could not be compiled for areas where aerial photography was used and for this reason it was not appropriate to classify habitats using the standard Phase 1 habitat types (JNCC, 2010). Instead, broader habitat types were used.

3.15 The habitats recorded during the extended Phase 1 habitat survey and aerial photography survey are given in Table 1 with an evaluation of their nature conservation value.

Table 1: Summary of habitat survey and baseline evaluation

Habitat	Likely value of habitat	% within Proposed Development Boundary (length in metres)
Arable	Zone of Influence	87.4
Agriculturally improved grasslands	Zone of Influence & County (LCGM target areas)	4.4
Semi-improved grasslands	Zone of Influence	1.1
Ruderal	Zone of Influence	0.2
Woodland	Local	0.7
Scrub	Zone of Influence	0.1

Habitat	Likely value of habitat	% within Proposed Development Boundary (length in metres)
Dune / coastal	County	2.9
Standing water (ditches)	Zone of Influence	0.008 (12,590 m)
Running water (rivers and streams)	County	0.001 (1,139 m)
Hedgerows	County	0.004 (5,710 m)
Developed land	Negligible conservation value	2.6

Watercourses

3.16 The extended Phase 1 habitat survey and aerial habitat survey identified a total of 142 ‘standing water’ ditches within the PDB and no ponds. The length of ditches within the PDB is approximately 12,590 metres. These are mostly narrow field boundary ditches with low botanical and invertebrate interest, as such they are considered to be of nature conservation value at the ‘zone of influence’ level only. Some of the ditches support water voles.

3.17 Sixteen ‘running water’ courses (rivers and streams) with a total length of 1,139 metres were recorded within the PDB. Although the area of running water within the PDB is a small proportion of the total area impacted, rivers and streams are considered to be of county level importance to nature conservation because of their wider value in the landscape.

Hedgerows

3.18 The extended phase 1 habitat survey and aerial habitat survey identified 5,710 m of hedgerows within the PDB. The hedgerows recorded were mainly species poor. However, all qualify as Habitats of Principal Importance (HPI) under s41 of NERC and provide a valuable corridor for ecological connectivity

across the farmland landscape. No hedgerows were recorded within the Intermediate Electrical Compound or Substation site.

3.19 Although the length of hedgerow within the Development Area is a small proportion of that found in the local area, their importance in maintaining ecological connectivity and networks makes them of 'county' importance for nature conservation.

Lincolnshire Coastal Grazing Marsh

3.20 In total approximately 56.9 ha of habitat split between the two Lincolnshire coastal grazing marsh (LCGM) target areas of Huttoft / Anderby and Burgh-le-Marsh have been identified within the PDB. Habitat modification works has already been undertaken within one field within the LCGM Burgh-le-Marsh target area to create new wetland. The LCGM Project has identified a total of five Priority Field Sites that lie within the Project Development Boundary to improve the grazing marsh grasslands to benefit wintering birds. Two of these fields are still in arable use and as such currently have a low ecological value.

3.21 The three LCGM Project Priority Field Sites that are currently wet and dry grassland are valued at the 'county' level of importance for nature conservation.

Badgers

3.22 Where land access was granted, a survey for evidence of badgers was undertaken. One disused badger sett was recorded within the PDB and an additional nine active setts (one main sett and eight outlier setts) were recorded within a 30 m survey buffer. No active setts were found within proximity of the Intermediate Electrical Compound or Substation. A variety of signs, including runs, latrines and footprints, were recorded, indicating widespread presence of badger.

3.23 Areas where access to land was not granted were not subject to a badger survey. In line with recommendations from Natural England (email correspondence 10th December 2014 - see TKES Application EIA Evidence Plan – Application Document 8.16) all potential badger habitat, not previously surveyed, will be surveyed during the pre-construction surveys. In anticipation that further badger setts will be found within the PDB and 30 m buffer, badgers have been assessed as of 'local' level importance.

Water voles

3.24 A habitat suitability assessment was undertaken for water voles using the extended Phase 1 habitat survey data and aerial photography. Suitable water

bodies (ditches, rivers and streams) within the PDB were surveyed for water voles where land access was available.

3.25 The habitat suitability assessment identified 191 water bodies with habitat suitable for water voles within the survey area where access had been granted. Evidence was found indicating the widespread presence of water voles throughout the survey area with water vole presence confirmed, by the presence of their burrows, latrines, feeding stations or by direct sightings in 41 of the 191 suitable water bodies surveyed.

3.26 Where land access was not available for survey, habitat suitability assessments were carried out using aerial photographs and water voles are assumed to be present where suitable habitat exists. The population of water voles using the suitable habitat within the PDB is considered to be of 'local' importance for nature conservation.

Otters

3.27 All water bodies within the survey area where access had been granted were searched for evidence of otter presence and for potential and actively used resting sites. There are water bodies within the survey area where access was not granted so surveys for otters were not carried out.

3.28 Otter feeding remains were found in one location within the survey area but no sightings of otters were made and no potential or actively used otter resting sites were recorded within the PDB.

Bats

3.29 No potential bat roosting habitat has been identified to-date within the PDB. One tree with features suitable for roosting bats has been avoided by alteration of the cable route.

3.30 Low, medium and high value habitats for commuting and foraging bats were identified during an initial walkover of the survey area. Areas within the survey area which were identified as being of high and medium value were subject to bat activity surveys including walked transects and static monitoring detector deployment.

3.31 A transect survey and static monitoring location was also undertaken at the site of the proposed substation, although it does not support any high potential foraging or commuting habitat. This is because the impacts on this area for foraging and commuting bats will be permanent.

3.32 Natural England has welcomed the focus of the bat activity surveys upon the habitat of greater value to bats (Section 42 Response 19th November 2014

(see TKES Application EIA Evidence Plan – Application Document 8.16). The level of survey undertaken was based upon the recommendations in the Bat Conservation Trust's 'Bat Surveys: Good Practice Guidelines' (Hundt, 2012). The level of survey effort was considered proportionate to the likely use of the site by bats and the potential effects of the proposed development on the species present.

3.33 A total of 15 transects and 19 static monitoring locations were surveyed. The transect and static monitoring activity surveys identified at least seven species of bat to be present within the survey area, with common pipistrelle (*Pipistellus pipistrellus*) being the most commonly recorded species in both the transect and static monitoring surveys.

3.34 Due to access restrictions, areas of high value foraging and commuting habitat for bats may not have been identified and therefore not subject to further survey. However, due to the similarity of the habitat across the survey area, it is not considered likely that bat species or activity level will differ significantly from areas already surveyed. As such, it is considered that the data gathered in the surveyed areas is representative of the survey area as a whole. The population of bats using suitable habitat within the PDB is considered to be of 'local' importance for nature conservation.

Birds

3.35 The extended Phase 1 habitat survey of the survey area found suitable habitat to support wintering birds. This included grasslands, arable fields and habitats at the landfall area. The desk survey found records of multiple species of bird within 1 km that could potentially overwinter within the survey area. For these reasons surveys for wintering birds were recommended. Wintering bird data was also collected to refine the landfall selection.

3.36 A survey for wintering birds was undertaken across the accessible parts of the survey area. Access was not possible at some locations for the point count surveys. However, as 42 points were surveyed this is considered to provide a good coverage of the survey area.

3.37 Bird populations for different species, within the PDB, were assessed as being of 'zone of influence' and 'local' value for nature conservation.

Reptiles

3.38 Approximately 30 ha of habitat suitable for reptiles was identified within accessible sections of the survey area. A presence/absence survey for reptiles was undertaken in all the accessible areas of suitable habitat. The surveys included a visual search for basking reptiles and a refugia search.

3.39 During the reptile surveys one juvenile grass snake (*Natrix natrix*) was found towards the north of the route near to Anderby Creek. In addition records of adders (*Vipera berus*), grass snakes, common lizards (*Zootoca vivipara*) and slow worms (*Anguis fragilis*) were recorded within 1km of the PDB in the desk study. The population of reptiles using suitable habitat within the PDB is considered to be of 'zone of influence' importance for nature conservation.

Great crested newt

3.40 The great crested newt (GCN) survey involved surveying standing water bodies (ditches and ponds) within the survey area.

3.41 A strategy was developed after discussion with Natural England during 2012 with an aim to confirm which ditches and water bodies were unsuitable for GCN. This strategy is outlined below:

- An ecological mapping exercise was completed using OS Mastermap to identify all water bodies within the survey area.
- A desk based screening exercise was undertaken to identify water bodies which could be excluded from the survey because they are separated from the proposed development by barriers such as roads, rivers and built up areas.
- All accessible ditches (363) and other standing water bodies (12 ponds) identified were visually inspected and assessed following the 'Habitat Suitability Index' (HSI) method as set out in Oldham *et al* (2000).
- Following the HSI surveys, a sampling strategy was agreed with Natural England, which involved surveying up to 50 accessible ditches considered suitable within the survey area, prioritising those with an HSI score of 0.7 and above but surveying all ditches in the Substation and Intermediate Electrical Compound areas. A total of 41 ditches were surveyed for presence or absence of GCN. No GCN were recorded during the surveys.
- All ponds considered suitable were also surveyed where access was possible. In total there were 12 accessible ponds within the survey area, two of these were dry so a total of 10 ponds were surveyed for presence/absence. No GCN were recorded during the surveys.

3.42 Due to access restrictions within the survey area not all ditches which had not been screened out were subject to a HSI survey. Additionally, there are 11 ponds which have not been subject to survey due to a lack of access permission.

3.43 Natural England has agreed to the approach of ponds not previously surveyed being surveyed during the pre-construction surveys (see EIA Evidence Plan – Application Document 8.16). Due to no GCN being found in the water bodies previously surveyed a European Protected Species (EPS) Licence is not required at this stage.

3.44 Should GCN be found during the pre-construction surveys then an EPS licence will be applied for in accordance with Requirement 19 of the draft DCO (Application Document 3.1).

4 DEVELOPMENT IMPACTS

4.1 The impacts of the development have been assessed in Volume 3, Chapter 4 'Terrestrial Ecology' of the TKES ES. The impacts on terrestrial ecology features are summarised in Table 2. Mitigation is required to reduce the severity of the impact, as specified in the ES Terrestrial Ecology Chapter or because the feature is protected under relevant legislation.

Table 2: Summary of predicted impacts of the Triton Knoll Electrical System

Feature	Value	Impact
Huttoft Bank Dunes LWS	County	Habitat Loss. An approximate area of 1ha will be temporarily lost within the LWS for siting of a construction compound and 0.5ha will be permanently lost for land raise to create a transition joint bay access and working area. These impacts are located on low value arable habitat and the impact is considered negligible.
Hedgerows	County	Habitat Loss. There will be a temporary minor adverse impact on hedgerows during construction when sections of hedgerows will be removed to enable cable trenching to be undertaken.
Lincolnshire Coastal Grazing Marsh Project Priority Field Sites*	County	Habitat loss. Temporary impacts within the Project Priority Field sites will occur during construction phase activities including soil stripping and trenching.
Badgers	Local	Without mitigation there is possibility of killing or injury of badgers using setts within the PDB and disturbance of badgers using other setts within 30 metres of the PDB. Impacts would be during the construction phase.
Water Voles	Local	Without mitigation there would be a minor adverse impact on water voles from killing and injury habitat destruction and fragmentation of water voles as a result of open cut trenching construction activity across ditches and running water.
Bats	Local	Bats could be impacted by temporary loss of foraging habitat and disturbance from construction activities, however, the impact has been assessed as negligible.

Feature	Value	Impact
Reptiles (grass snake)	ZoI	Vegetation removal, soil stripping and open-cut trenching during the construction phase could result in the killing and injury of reptiles occupying suitable habitats within the PDB. The significance of the impact is considered negligible. Reptiles are protected from killing and injury by legislation.
Water Crossings	County (rivers and streams) ZoI (field ditches)	Habitat loss. Avoidance of impacts on rivers and major field drains (those maintained by internal drainage boards) would be achieved by mitigation measures adopted as part of the proposed development.
Birds	ZoI & Local	Breeding birds could be impacted by damage or disturbance of active nests if vegetation clearance is undertaken during the bird breeding season. The impact on wintering birds is considered to be negligible.

ZoI = Zone of Influence

* LCGM Project has modified one field, which is crossed by the PDB, to create favourable wetland conditions (flooded scrapes, ridge and furrow, raised water levels) for wintering birds. Two further fields within the Burgh-le-Marsh target area, within which the PDB is located, are semi-improved grassland and are considered to be of County level importance. See paras 6.18 to 6.24 below.

5 PRE-CONSTRUCTION SURVEY

Overview

5.1 Pre-construction surveys are proposed for areas where surveys were not previously possible due to lack of land access and also to provide updated information on ecological features for which the status may have changed since they were surveyed pre-consent. The survey results will be used to refine the mitigation proposed in this OLSEMP and to discharge the relevant requirements of the DCO. Pre-construction survey data will inform the final mitigation methodology that will be applied to ensure that the Development does not contravene relevant legislation with regard to ecology and protected species. The following pre-construction surveys will be undertaken:

- Habitat survey, including hedgerows and water crossings, of areas previously unsurveyed by ground based Phase 1 habitat survey technique, within the PDB;
- GCN survey of ponds not previously surveyed within 250 metres of the PDB;
- Habitat suitability assessment for reptiles on areas not previously surveyed, by ground based survey, within the PDB (combined with habitat survey);
- Bat surveys including: tree inspections, climbing surveys and dusk emergence and dawn return to roost surveys of areas not previously surveyed within the PDB and an additional 15 metre survey buffer;
- Trees previously identified with potential for bats on the entire length of the cable route will be checked, to determine if potential has changed, during an ecological walkover survey of the route;
- Water vole and otter survey of areas previously unsurveyed and re-survey of all suitable water courses within the PDB which will be impacted during development;
- Badger survey of areas previously unsurveyed within the PDB and additional 30 metre survey buffer; and
- Badger setts previously identified within the PDB and additional 30 metre survey buffer will be checked for changes in status during an ecological walkover survey of the route.

5.2 No pre-construction surveys are proposed for birds or bat activity as sufficient information is available in the baseline assessment to inform the mitigation required.

5.3 Details of the pre-construction surveys are given in the following sections.

Habitat Survey

Pre-construction survey of areas not previously surveyed

5.4 An extended Phase 1 habitat survey (JNCC, 2010) will be undertaken of any areas within the PDB, not previously surveyed due to lack of land access. Phase 1 habitat survey is a standard technique for rapidly obtaining baseline ecological information over a large area of land. It is primarily a mapping technique and uses a standard set of habitat definitions for classifying areas of land on the basis of the vegetation present. For this survey, the technique will be modified (or extended) to provide more detail over a smaller area, and give further consideration to habitat suitability for protected species or species of conservation concern. The standard habitat definitions will be used with an additional category of coarse grassland for unmanaged, secondary grasslands that are species poor.

Great Crested Newts

Pre-construction survey of areas not previously surveyed

5.5 Natural England (email correspondence 28th August and 6th January 2015) has agreed that ponds with medium potential not previously surveyed, due to lack of land access, will be surveyed during the pre-construction surveys. The Order Limits of the TKES includes these unsurveyed ponds to ensure access is available.

5.6 A Habitat Suitability Index (HSI) assessment will initially be conducted on the previously unsurveyed ponds within the Order Limits (which are within 250 metres of the PDB), following the method set out in Oldham *et al* (2000). Following the HSI surveys any ponds deemed to have potential to support GCN will be subject to presence or likely absence surveys.

5.7 The presence/absence surveys will consist of four visits, during which at least three techniques (egg search, torchlight survey, bottle trapping, netting) to search for the presence of GCN will be used, in line with the English Nature (now Natural England) Great Crested Newt Mitigation Guidelines (English Nature, 2001). During each visit the air temperature (°C), vegetation cover (%) and turbidity (0-5 score) will also be recorded.

5.8 If GCN are found to be present in any ponds, a further two survey visits will be conducted to assess the abundance of GCN. The results of all the visits will be compared to provide the maximum count for each pond on which a population size class estimate will be based.

5.9 If GCN are recorded in any ponds during the pre-construction surveys, further survey is likely to be required at that location on the cable route, of all suitable waterbodies (including suitable ditches) within 250 metres of suitable terrestrial habitat within the PDB. These surveys would be designed to provide sufficient survey information on the GCN meta-population in the area to inform a European protected species licence mitigation method statement which will be prepared and submitted to Natural England for approval.

Reptile Survey

Pre-construction survey of areas not previously surveyed

5.10 During the extended Phase 1 habitat survey of previously unsurveyed areas, suitable habitat for reptiles within the PDB will be recorded. Further survey for reptiles will then be undertaken in these areas or they will be subject to precautionary mitigation measures (see Section 6). Any impacts on reptiles will be confined to within the PDB and for this reason there is no requirement for an additional survey buffer.

Bat Surveys

Pre-construction survey of areas not previously surveyed

5.11 The pre-construction survey area for potential bat roosts will be defined as all accessible land not previously surveyed, within the PDB and an additional 15 m survey buffer. Surveys will include:

Ground Level Tree Assessments

5.12 Trees within the survey area will be inspected from the ground for features that could support roosting bats (e.g. holes, cracks, loose bark, ivy). Evidence of roosting bats will also be searched for (scratch marks, staining, droppings, distinctive smell or noises).

Aerial Tree Inspections

5.13 Where it is safe to do so, trees identified as having potential to support roosting bats will be climbed with the aid of a ladder and/or ropes, or accessed via a mobile platform. The ecologist will look for evidence of bats using a fiberscope or mirror as appropriate. Any inaccessible cavities that cannot be thoroughly inspected will be recorded and recommended for further survey.

Categorisation of Results

5.14 Following the ground level tree inspections and aerial tree inspections, each tree will then be graded and placed into a category for its level of potential to support roosting bats.

Dusk Emergence and Dawn Return to Roost Survey

5.15 Trees remaining with potential to support roosting bats, which cannot be avoided by micro-siting of the route, will be subject to dusk emergence and dawn return to roost surveys to confirm presence or likely absence of bats.

5.16 Ecologists will be stationed to allow potential access or egress points in trees to be watched at dusk and/or dawn. A Duet frequency division bat detector will be used by each ecologist to detect bats emerging from or returning to the potential roost sites.

Pre-construction surveys of areas previously surveyed

5.17 Within the survey area which has already been subject to bat surveys, all trees previously identified with potential for roosting bats within 15 m of the PDB will be subject to a ground level tree assessment as detailed above to confirm whether they have potential to support roosting bats at the time of the survey. Should features which indicate potential to support roosting bats be identified then avoidance measures or further surveys to inform an EPSL mitigation method statement will be required.

Water Vole and Otter Survey

Pre-construction survey of areas not previously surveyed

5.18 In areas where surveys have not previously been carried out, all water courses (ditches, streams and rivers) within the PDB, will be surveyed for water voles and otters. This will entail a habitat suitability assessment and a search for signs of recent water vole and otter activity.

5.19 Where suitable habitat is recorded, a survey for evidence indicating the presence/absence of water voles and otter will be undertaken. This will include a search for signs of recent water vole and otter activity including: spraints, tracks, burrows, nests, latrines, pathways, feeding stations and grazed lawns. Where signs are observed the location will be mapped and a grid reference recorded. Reference photographs will also be collected.

Pre-construction survey of areas previously surveyed

5.20 All suitable previously surveyed water bodies on the cable route that will be impacted by the development will be resurveyed pre-construction to determine change in status and inform mitigation requirements for water voles and otters (if required).

Badgers

Pre-construction survey of areas not previously surveyed

5.21 All land within the PDB and an additional 30 m survey buffer, which has not previously been surveyed, will be subject to a single visit to assess for badger presence/absence.

5.22 Badger setts and other evidence of badger activity will be recorded. The classification of badger setts used in this survey will be based on definitions given in Clark (2010), including main, annex, subsidiary and outlier setts. The level of badger activity will be recorded as well used, partially used or disused (no sign of current use). The number of sett entrances will be recorded.

Pre-construction survey of areas previously surveyed

5.23 Badger setts previously surveyed will be checked during a pre-construction ecological walkover survey of the route to confirm their status and inform mitigation requirements.

6 ECOLOGICAL MITIGATION STRATEGY

Introduction

6.1 This section describes the terrestrial ecological mitigation requirements for the construction and operation phase works within the onshore TKES PDB. Mitigation relating to the restoration of habitats following completion of works is also outlined.

6.2 Certain mitigation measures were identified and adopted as part of the evolution of the project design, these are subsequently referred to as 'embedded mitigation'. Following the identification of significant impacts on ecological features during the environmental impact assessment (EIA), further additional 'applied mitigation' has been prescribed in the Terrestrial Ecology ES chapter, to mitigate against the identified impact. An outline of both the embedded and additional mitigation is provided in Volume 3 Chapter 4 'Terrestrial Ecology' of the TKES ES. The purpose of this Outline LSEMP is to provide further detail on the mitigation methods that will be undertaken.

6.3 At the project design stage careful routing of the onshore cable route and positioning of the Intermediate Electrical Compound and Substation has been undertaken to avoid key areas of ecologically sensitive habitat. This has been further refined as the project has evolved through micro-siting to avoid features identified during survey that may indicate presence of protected species e.g. badger setts, or important habitats e.g. woodlands, ponds and hedgerows.

6.4 An Ecological Clerk of Works (EcOW) will be employed for the duration of the project to ensure mitigation method statements and plans are implemented.

6.5 The following high level principles in relation to terrestrial ecology have either been incorporated into the overall project design or will be employed during the construction, operation and post construction restoration periods. Further detail will be added following discussion and agreement with statutory consultees. Following issue of the DCO, pursuant to Requirement 13 of the DCO (Application Document 3.1), mitigation methods will be expanded upon to detail specific habitat and relevant species protection, restoration and management measures (together with a schedule of works and method statement for each) required to discharge the DCO.

6.6 Where separate licenced mitigation method statements are required for protected species (only badger at the current time) these will be submitted to Natural England (NE) for approval. These documents once approved will

superceed the outline mitigation measures proposed for that species in this document.

6.7 Natural England has agreed that no other licences, except for the draft badger licence, will be required, at pre-submission stage, for European or other nationally protected species (see EIA Evidence Plan – Application Document 8.16).

Terrestrial Habitats

6.8 Terrestrial habitats within the PDB will be reinstated following the completion of construction

6.9 In areas where impacts are avoided by trenchless crossing techniques, important habitats will be protected from incursion by construction machinery and workforce through the use of signage and fencing as appropriate.

6.10 The ecologists and landscape architects will work closely together to ensure an integrated approach to the ecological and landscape mitigation and to determine the appropriate protection and restoration of landscape features and habitats. Restoration will seek to replace vegetation with the same species identified in the extended Phase 1 habitat survey as far as is practicable.

6.11 At temporary construction compounds, important neighbouring habitats will be protected from incursion by construction machinery and workforce through the use of signage, fencing and work force briefings.

6.12 In addition to the mitigation measures set out above, native species landscape planting will be undertaken at the IEC and Substation. Further information on the planting scheme for the IEC and Substation is provided in the Landscape and Visual Mitigation section (Section 7) of this document.

Watercourses

6.13 Running watercourses and field ditches will be crossed in an ecologically sensitive manner through either trenchless techniques or open cut trenching. Narrowed working widths of 30 m will be employed for watercourses where protected species (i.e. water vole) have been detected;

6.14 Open-cut trenching will be used during the crossing of the majority of the minor field drains / ditches (excluding those owned/operated by an internal drainage board / the Environment Agency and the Canal and River Trust or any others identified as being crossed using trenchless crossing techniques as set out in the Crossing Schedule – Application Document 8.3). Cut trenches will be shored up. Plastic ducts will be installed into each trench,

through which the cables will be pulled from each jointing pit (spaced approximately 600 m to 1000 m intervals).

6.15 Pollution will be controlled during construction works by following appropriate Environment Agency Guidelines (PPG1 General guide to the prevention of pollution; and PPG5 Works and maintenance near water) and relevant plans in the Outline CoCP (Application Document 8.7). This will minimise damage to habitats and/or food resources used by fauna and prevent direct toxic effects on individual animals.

6.16 Land drains within the cable route, which may be temporarily affected by construction operations, will also be restored following completion of construction. This is important to ensure that the growth of trees and hedgerows is not affected by changes to the surface water drainage system.

6.17 A reduced working width (maximum 30 m) will be used when crossing ecologically sensitive water courses (e.g. known water vole habitat) and hedgerows.

Hedgerows

6.18 Hedgerows which will have been removed during the construction period will be replanted, including on the cable route. With the exception of the very short section of 400 kV circuits to the south of the existing National Grid Substation at Bicker Fen, trees will not be planted on or within 6 m of the edge of the cable trench to avoid the risk of damage to the cable by tree roots. However, the route has sought to avoid groups of trees where possible with only limited losses likely.

6.19 Working widths will be reduced to 30 m for hedgerow crossings. Removal will take place in advance of cable installation works beginning in each section. Once cable installation works have been completed in each section, cut brash will be replaced within the gap created to maintain linear structure and function as an ecological corridor. This brash will remain in-situ for the remainder of the construction phase, unless cable testing activity requires access to be taken. If access is required an ecologist will check the brash to ensure no nesting birds are present prior to removal. The brash will be used during the restoration phase as a framework to protect newly planted hedging plants and maintain connectivity as the newly planted hedgerow matures.

6.20 In addition, hedgerow in proximity to the working width will be protected from disruption and if necessary protection fences will be erected to ensure that roots remain undisturbed.

6.21 Where hedgerows crossings are designed with a trenchless crossing technique, working widths will be reduced to around to 10m to accommodate the haul road and an appropriate buffer,

6.22 Where possible any tree, scrub or hedgerow removal required to facilitate the development will be carried out outside the breeding bird season (removal undertaken between September and February inclusive). If this is not possible the vegetation shall be checked by an ecologist prior to removal to ensure no nesting birds are present and appropriate measures are in place to protect other sensitive species encountered.

6.23 Where scheduling undertaken at the detailed design stage means it is preferable to remove hedgerow to facilitate the construction phase, the Applicant considers that hedgerow removal are facilitation works and as such are appropriately excluded from the definition of commencement in relation to the onshore construction phase of the proposed development. Hedgerow removal is agreed with Natural England to be 'facilitation works' and therefore outside of the formal commencement of onshore works.

6.24 During the cable duct installation phase the Ecological Clerk of Works will determine, on a case by case basis, whether it is necessary to put in temporary measures to provide a linear feature along which bats may commute. If the habitat, and bat survey results (undertaken as part of the application), suggest that the hedgerow may be acting as a major commuting route temporary chestnut paling fencing (or similar) will be placed in the gap at the end of each working day to maintain the integrity of the linear feature.

6.25 During the restoration phase the lengths of removed hedgerow will be replaced with native plantings. Further hedgerow planting will also take place within existing gaps in hedgerows within the onshore development area. This measure leading to an increase in the overall length of hedgerow present within the area.

Transition Joint Bays

6.26 The made ground to be constructed to house the TJBs will provide an opportunity to establish wild flower rich grassland in an area currently being used for crop production. The types of flora to be established in this area would be determined following a survey of the areas of grassland in adjacent areas of the Lincolnshire Coastal Country Park, with the aim of expanding the area of existing habitat. Approximately 0.5 ha of grassland will be established and managed annually, both to ensure access to the TJBs is maintained and to benefit the habitat. Depending on the seed mix chosen it is likely that the grassland would be mechanically cut annually with spot control of perennial

weeds (such as creeping thistle, ragwort, broad-leaved dock etc.) undertaken to prevent both degradation of the grassland and contamination by perennial weed seeds of adjacent fields. The final specification of the seed mix and the annual management would be provided in the Ecological Management Plan as detailed in Requirement 13 of the draft DCO (document reference 3.1).

Lincolnshire Coastal Grazing Marsh

6.27 The PDB passes through the two Lincolnshire Coastal Grazing Marsh (LCGM) Project target areas at Anderby / Huttoft and Burgh-le-Marsh.

6.28 The Lincolnshire Coastal Grazing Marsh (LCGM) Project focuses on two types of grassland habitat:

- Creation of wet grassland (wetland) suitable for waders and breeding birds. This habitat is usually created from arable fields and requires the development of scrapes, pool and linear channels similar to historic patterns of ridge and furrows to feed the site with water. To create these sites water needs to be retained in the fields so require careful manipulation of the drainage systems; and
- Preservation of historic grazing grassland habitats in archaeologically sensitive fields. These fields often have historic ridge and furrow patterns, remnants of deserted villages, salterns and other earthworks. These areas are not normally converted to wetland sites.

6.29 Within the target areas, 7 sites have been identified by the LCGM Project for regeneration of LCGM habitat. Full details of the agreed mitigation for the LCGM is set out in Appendix 1 of the Outline Construction Method Statement (Revision B) (document reference 8.7.1)

Local Wildlife Sites

6.30 The three locally designated sites that are to be crossed during works (Huttoft Bank Dunes SNCI, Old River Lymn SNCI and South Forty Foot Drain LWS) shall not be impacted due to the implementation of trenchless crossing techniques during cable installation as set out in the Crossing Schedule (Application Document 8.3).

6.31 At Huttoft Bank Dunes LWS the location of the temporary construction compound (identified as TCC 1) has been carefully located within ecologically low value arable habitat. Trenchless crossing techniques will be used to cross the area of the LWS for which notification stands and habitats will be fully restored post development. Additional mitigation includes the following:

- Fencing the temporary construction compound to be used to ensure integral features of LWS unaffected (further detail provided in the Outline CoCP – Application Document 8.7).
- Toolbox talks given and strategically placed signs to inform workforce of important coastal habitats.

- Controlled pollution and dust emissions as set out in the Outline Air Quality Management Plan (Application Document 8.7.4) and the Pollution Prevention and Emergency Incident Management Plan (Application Document 8.7.8).
- Light scatter will be minimised where possible (further detail provided in the Outline Artificial Light Emissions Plan (Application Document 8.7.6)).

Great Crested Newt Mitigation

6.32 Currently no GCN populations have been recorded within 250 metres of the PDB. Should a population of GCN be recorded during pre-construction surveys a European Protected Species License (EPSL) application would be made to Natural England to cover any works likely to affect any water bodies known to contain GCN and any suitable terrestrial habitat within 500m of these water bodies. Full details of any mitigation required would be fully detailed in the EPSL method statement and would be subject to approval by Natural England. Further survey to inform the EPSL may be required to provide data on the GCN meta-population at the relevant location on the cable route.

Reptile Mitigation

6.33 Embedded mitigation for reptiles includes habitat restoration post development.

6.34 Assuming that only 'low' populations of common reptile species (as defined in 'Froglife Advice Sheet 10', 1999) are identified during the pre-construction survey and subject to agreement by the relevant parties, a displacement methodology will be used to prevent killing and injury of reptiles during the construction works. A separate reptile mitigation method statement will be produced post consent and following the results of pre-construction surveys. The method statement is likely to include the following:

- Habitat identified as supporting reptiles, or potentially supporting reptiles, within the development boundaries of the cable route corridor, intermediate compound and substation will be cut no lower than 150mm in height one week prior to soil stripping in order to encourage any reptiles that may be present to disperse off-site.

- The vegetation will be cut with hand-held machinery (e.g. strimmers) to reduce the risk of reptiles being crushed by machinery; and
- A destructive search will be carried out one week after the vegetation clearance. This would begin with dismantling any rubble piles and other debris by hand, followed by hand raking over the ground and stripping of the remaining vegetation using an excavator with a toothed bucket.
- All mitigation works will be supervised by a suitably qualified ecologist.

Birds

6.35 Trees, scrub and hedgerows with potential for nesting birds will be cleared outside of the bird breeding season (i.e. clearance between September and February, inclusive). Where this is not possible and vegetation requires clearance within the bird breeding season, nesting habitat will be checked by an ecologist for the presence of active nests. If active nests are found a works exclusion buffer will be established to prevent damage to the nest until it is no longer active.

6.36 The breeding bird survey recorded one species, the barn owl, listed on Schedule 1 of the WCA 1981. Barn owls are assumed to be breeding in the area, however, no nests or known breeding locations have been located within the PDB during the desk study or field surveys. The monitoring of breeding activity by the ECoW will ensure that the works do not impact barn owls or other breeding birds.

Bat Mitigation

6.37 Embedded mitigation to reduce impacts on bats includes reduction in working width at hedgerow crossings and habitat restoration post development. Lighting required during construction works will be designed to minimise light scatter (further detail provided in the Outline Artificial Light Emissions Plan (Application Document 8.7.6). In line with recommendations made by Natural England (EIA Evidence Plan – Application Document 8.16) in areas that require 24 hour working (e.g. horizontal directional drilling under watercourses which are of interest to bats) any lighting of the working corridor will be low level and directed to the ground. Lighting design is specified in the Outline Artificial Light Emissions Plan (Application Document 8.7.6)

6.38 If pre-construction surveys record bat roosts within the PDB or within the 15 metre additional survey buffer. Avoidance or mitigation measures will need to be undertaken to avoid killing, injuring or disturbing bats.

6.39 Avoidance of direct impacts or disturbance of bat roosts, or potential bat roosts, will be avoided wherever possible by micro-siting of the cable works within the PDB. Avoidance of disturbance can also be achieved by timing of the works to avoid the seasons when bats are likely to be using roosting sites. Natural England has welcomed the micro-siting of the cable route around trees with the potential to support roosting bats (EIA Evidence Plan – Application Document 8.16).

6.40 If avoidance of impacts cannot be achieved appropriate mitigation will be required under an EPSL approved by Natural England. Mitigation measures will follow best practice guidelines (Hundt 2012). If required, EPSL mitigation method statements will be submitted to Natural England post consent. Mitigation is likely to include the following:

- Appropriate replacement habitat will be provided where the loss or damage of roosts cannot avoided. This will be achieved through the creation, restoration or enhancement of nearby habitat for bats;
- Replacement habitat will be managed and maintained in order to ensure the population will persist; and
- Post-development monitoring of the population will be undertaken to assess the success of any mitigation and compensation measures.

Otter Mitigation

6.41 Should pre-construction survey indicate that development work is likely to negatively affect otters, mitigation would be required under an EPS Licence approved by Natural England. Mitigation strategies are likely to include:

- Avoid working in areas that may be used by otters such as holts, couches or other structures that may be used as shelter;
- Avoid working at night as otters are principally nocturnal; and
- Deploying otter-proof fencing where necessary to prevent any harm to otters due to them coming onto the development site.

Water Vole Mitigation

6.42 A reduced working width of 30 metres will be used at water crossings where water voles have been found to be present. Trenchless crossing techniques will be used at rivers and streams which will avoid impacts on water voles at these crossings.

6.43 It was agreed with Natural England at the second Review Panel Meeting (EIA Evidence Plan – Application Document 8.16) that a water vole licence to trap

and translocate will not be required and that displacement of water voles by habitat manipulation, under a method statement, would be appropriate mitigation. Natural England has recommended that all potential water vole habitat be surveyed during pre-construction surveys (email correspondence 10th December 2012).

6.44 Where signs indicating the presence of water vole have been identified within the PDB a displacement methodology will be used to remove water voles from the impacted area prior to development. The full details of the displacement methodology will be provided in a separate mitigation method statement for water voles pursuant to Requirement 13 of the draft DCO (Application Document 3.1), should any water voles be identified. Displacement of water voles does not currently require a licence from Natural England.

6.45 The displacement methodology for water voles is likely to include the following elements:

- Before vegetation removal begins the position of all burrows within the PDB will be identified so that it can be ensured that they do not become blocked;
- In spring, bankside and fringe vegetation within the PDB and a 5 m buffer area will be removed, until only bare earth remains, in order to make the area unsuitable for water vole and encourage them to disperse into adjacent areas of more suitable habitat during the breeding season;
- Any excess arisings removed from the strimmed area will then be raked off and burrow entrances will be checked to ensure they are not blocked; and
- Three days after the last field sign of water vole presence is recorded the area will undergo a destructive search, using hand-tools to remove all remaining vegetation and roots, under the supervision of a suitably experienced ecologist.

Badger Mitigation

6.46 No badger setts have been identified within the PDB to date. One active main sett and five outliers have been identified within an additional 30 m buffer that could be impacted by disturbance from construction activity. It has been agreed with Natural England (EIA Evidence Plan – Application Document 8.16) that a draft European Protected Species Licence will be submitted to Natural England, pre-consent, using data gathered from the baseline surveys. This will enable a letter of no impediment to be granted by Natural England

for works that will affect a badger sett. The badger licence will include production of a species specific method statement.

6.47 Should additional badger setts be identified during pre-construction surveys which could be impacted by the development, further mitigation under licence from Natural England or under a Precautionary Working Method Statement will be required.

6.48 If the work is not likely to cause interference to a sett then harm can be minimised by maintaining access between setts and foraging/watering areas, keeping any excavation work or heavy machinery away from where it could cause damage or disturbance to the sett or any badger within it, minimising noise and vibration resulting from the works that could cause disturbance to any badgers occupying a sett and ensuring any trees that require removal are felled away from the sett with badger paths being cleared of any cleared vegetation; or

6.49 If the work is unable to avoid interference to an occupied badger sett, a licence for any works will first need to be acquired from Natural England. Under the terms of this licence, any sett interference cannot occur within the badger breeding season, between the beginning of December and the end of June. In order to remove the badgers from any harm that could be caused should they be occupying a sett during works that occur outside of this breeding season, a program of exclusion could be undertaken. This could involve using one-way gates on all sett entrances which would remain in situ for 21 days following the last sign of access by a badger to the sett.

6.50 Additional working practices: during the construction phase of the development, escape routes shall be provided for mammals (e.g. badgers) if deep trenches are excavated. In addition, any exposed pipe systems will be capped when not in use to prevent species gaining access.

7 LANDSCAPE AND VISUAL MITIGATION

Introduction

7.1 This section describes the terrestrial landscape and visual mitigation principles for the construction and operation of the Intermediate Electrical Compound, Substation, Unlicensed Works at the Bicker Fen Substation and the Cable Route.

7.2 All proposed landscape and visual mitigation measures, including planting proposals, have been identified and adopted as part of the evolution of the project design (embedded into the project design) and therefore no additional 'applied mitigation' is proposed in addition to embedded mitigation.

7.3 This includes at the appropriate time and pursuant to Requirement 6 of the DCO, a written landscaping scheme securing detailed design and mitigation being agreed with the relevant planning authority for both the IEC and substation sites and implemented.

Intermediate Electrical Compound Mitigation Strategy

7.3 The location of the proposed Intermediate Electrical Compound has been selected to take advantage of a position between existing built forms, i.e. the grain store adjacent to the western boundary of the site and Skegness Stadium adjacent to the eastern boundary. This position: avoids the Intermediate Electrical Compound being located in an exposed position within more open parts of the study area; maintains balance with existing built form adjacent to Marsh Road; and takes advantage of the screening effect of the adjacent grain store in particular. The siting of the Intermediate Electrical Compound has taken into account the principles of local landscape character area J1: Tetney Lock to Skegness Coastal Outmarsh (East Lindsey District Council, 2009).

7.4 There is negligible tree and hedgerow cover on the site at present and the proposed landscape and visual mitigation aims to introduce an appropriate amount of mixed native woodland planting on the perimeter of the site whilst balancing the consideration that extensive planting is not entirely appropriate within this open landscape. Proposed planting will: respect the linear form and structure of the field boundaries and Marsh Road, maintaining balance; provide a partial landscape and visual separation between the Intermediate Electrical Compound and existing built form (the grain store to the west and the stadium to the east); and provide a screen to views from surrounding

visual receptors, such as users of Marsh Road and residential receptors on Ingoldmells Road, to the south.

7.5 Proposed planting will be of a similar species composition to that found in the vicinity of the site, such as the hedgerow and tree cover located on the opposite side of Marsh Road to the stadium. Species identified in the pre-construction, extended Phase 1 habitat survey that is detailed above in paragraph 5.4 will be incorporated. The planting structure would consist of a band of lower level woodland edge planting around the edge of the site (e.g. hawthorn, blackthorn, field maple etc), which is intended to provide visual density at a lower elevation below the tree canopy; and a belt of woodland trees which will provide a screen to views of higher levels of the IEC, once mature.

7.6 Where reasonably practicable, some limited planting may be undertaken around the perimeter of the IEC site once the enabling works are complete to allow for some landscaping to become established whilst the construction work on the above ground infrastructure is underway within the compound. The remainder of the planting will be undertaken on completion of the construction activities. This will be set out the landscaping scheme approved under Requirement 6 of the DCO.

7.7 Refer to Figure 7.1 for an illustration of the applied mitigation principles set out here.

Substation Mitigation Strategy

7.8 The location of the proposed Substation has been selected to take advantage of a position in the vicinity of the South Forty Foot Drain and existing electrical infrastructure (pylons, wind turbines and existing Bicker Fen substation). This position limits landscape and visual effects through: clustering with existing similar infrastructure; utilisation of the screening effect of the South Forty Foot Drain embankments to the west; and acknowledging and maintaining the existing geometric pattern of field boundaries, drainage channels and linear belts of planting beside the South Forty Foot Drain. The siting of the Substation has taken into account the principles of local landscape character area A1: Holland Reclaimed Fen (Boston Borough Council, 2009).

7.9 There is negligible tree and hedgerow cover on the site at present and the proposed landscape and visual mitigation aims to introduce an appropriate amount of mixed native woodland planting on the perimeter of the site. Proposed planting will: respect the linear form and structure of the surrounding field boundaries, maintaining balance; and provide a visual

screen to views from surrounding receptors, such as users of the South Forty Foot Drain public right of way and local residential properties.

7.10 Proposed planting will be of a similar species composition to that found in the vicinity of the site, such as the hedgerow and tree cover located adjacent to the nearby South Forty Foot Drain. Species identified in the ecology surveys as part of the project will be incorporated into the proposed planting mixes. The planting structure would consist of a band of woodland edge around the edge of the site (e.g. haw thorn, black thorn, field maple etc.) which is intended to provide visual density at a lower elevations and below the canopy of the trees; and a belt of woodland trees which will provide a screen to views of higher levels of the Substation once mature.

7.11 Where reasonably practicable, some limited planting may be undertaken around the perimeter of the substation site once the enabling works are complete to allow for some landscaping to become established whilst the construction work on the above ground infrastructure is underway within the compound. The remainder of the planting will be undertaken on completion of the construction activities. This will be set out the landscaping scheme approved under Requirement 6 of the DCO.

7.12 Refer to Figure 7.2 for an illustration of the applied mitigation principles set out here.

Unlicensed Works at the Existing Bicker Fen Substation

7.13 The Unlicensed Works will be contained within the existing hard standing and fence-line of the Bicker Fen Substation which avoids the loss of any vegetation. The temporary construction compound (identified as TCC 26) will be located directly adjacent to the construction operations and within the wider existing substation compound, limiting its landscape and visual effects. This also utilises existing screen planting which has been implemented around the existing Substation fence-line.

Management and Maintenance of Planting

7.14 Each plant will be subject to a 10 year management and maintenance programme as secured in Requirement 7(2) of the draft DCO (document reference 3.1)

7.15 An outline programme for the aftercare and monitoring is set out as follows:

- Year 1 details of start date, seed mix, details of planting, tree/shrub numbers and preliminary survival. Maintenance scheme, weeding, pruning, watering, feeding, etc. as required.

- Year 2 observation on the condition and growth of trees/shrubs, survival and replacement programme, details of any natural colonisation. Maintenance scheme carried out.
- Year 3 and 4 observations on condition and growth of trees/shubs, survival and replacement programme, maintenance scheme carried out focusing on weeding requirements, tree stake removal.
- Year 5 observations on condition and growth of trees, and maintenance scheme carried out, site report reviewing progress and proposals for management during period to year 10.
- Years 5 to 10 observations on condition and growth of trees, and maintenance scheme carried out. Survival and replacement programme as required.

Cable Route Mitigation Strategy

7.16 In relation to the construction of the onshore cable route, the following embedded landscape and visual mitigation measures have either been incorporated into the overall project design or will be employed during construction and will therefore be included as part of the construction method statement secured within any relevant code of construction practice in accordance with Requirement 14 of the DCO:

- Sensitive route design: the design of the onshore cable route has avoided notable landscape features, such as groups of trees and hedgerows, where possible. Where loss of a landscape feature is unavoidable, the loss has been kept to a practical minimum;
- Location of site compounds: the storage of materials and vehicles will be required in numerous temporary site compounds along the proposed onshore cable route. To minimise potential impacts the locations of the site compounds have been selected directly adjacent to: the proposed landfall works on the landward side of the sand dunes (TCC 1); the proposed cable route; existing bell-mouth access where available; and away from notable tree cover;
- Construction working width: the working width during the construction phase will be confined to a corridor of no greater than 60 m to minimise the construction footprint on the landscape. A minor exception to this is between a short section of the route which will be 66 m in width, close to the A158 road;
- Best Practice Working Methods: a pre-construction walkover survey of the working area will be undertaken by an appropriately experienced

arboriculturalist and the guidance set out in BS 5837:2012 Trees in Relation to Construction will be adhered to where applicable. The survey will define specific mitigation measures required for all trees situated in or adjacent to the working width, including measures such as the erection of protective fencing in order to minimise the impacts on trees and their roots.

In addition, hedgerow in proximity to the working width will be protected from disruption and if necessary protection fences will be erected to ensure that roots remain undisturbed;

- Trenchless crossing techniques will be adopted at the location of certain sensitive landscape features, for example: the sand dunes at the landfall point; rivers and drains. Trenchless crossing techniques operations may be extended to avoid certain lines of trees which are adjacent to these features. This approach avoids the loss or damage to these features;
- Restoration: following completion of construction operations all agricultural land will be restored to its previous condition. Topsoil will be prepared and seeded using an appropriate seed mix or returned to arable cultivation.

  Land drains within agricultural land on the cable route, which may be temporarily affected by construction operations, will also be restored following completion of construction. This is important to ensure that the growth of trees and hedgerows is not affected by changes to the surface water drainage system.

  Hedgerows which have been removed for construction will be replanted, including on the cable route. Trees will not be planted on or within 6 m of the edge of the cable trench to avoid the risk of damage to the cable by tree roots. However, the route has sought to avoid groups of trees where possible with the result that only limited losses likely. Restoration will seek to replace vegetation lost with the same species which are identified within the Phase I habitat survey as far as is practicable.

  Considering the landfall point specifically, the beach area at Anderby Creek will be returned as far as is practicable to its original condition. In addition, Transition Joint Bays (TJBs) have been located away from the beach area and will be situated within inland of the sand dunes, within the onshore cable corridor in fields. Each TJB will require land raising of up to 1.5 m. However, the completed TJBs will appear similar in appearance to earth bunds which are typical within the locality, beside drains, albeit smaller in scale and with two manhole covers (1.1 sq m) evident above ground;

- Considering the connection to the existing Bicker Fen Substation, the cable route location and extent has been proposed to minimise loss of existing tree planting which is located on the periphery of the existing Substation compound. Although planting around the Substation has not yet reached full maturity, it is acknowledged that this planting has previously been implemented by the Bicker Fen Substation operator to integrate the Substation into the landscape and mitigate certain visual effects. Specific consideration has therefore been given to the cable route entry into the Bicker Fen Substation.
- The entry of the cable route into the northern extent of the existing Substation compound will require some clearance of existing (albeit relatively recently planted) tree planting. However the cable route has been selected to avoid the creation of direct views through the cable corridor from nearby visual receptors to the north and north-east, such as residential receptors in Bicker Gauntlet. In addition, the working width of the proposed cable route located to the east of the existing Bicker Fen substation has been located away from mature planting adjacent to Vicarage Drive and has been limited to a maximum of 16 m to limit the loss of relatively newly planted trees and shrubs. The operational width of the cable route will be 6 m upon which only shallow rooting species will be planted. This width has been kept to a minimum to ensure that trees (deeper rooting) can be planted within the majority of the working width; and
- The project landscape architects and ecologists will work closely together to ensure an integrated approach to the landscape and ecological mitigation and to determine the appropriate protection and restoration of landscape elements and habitats (e.g. hedgerows, rivers / streams, coastal and grazing marsh etc). Restoration will seek to replace vegetation lost with the same species which are identified within the Phase 1 habitat survey as far as is practicable.

8 REFERENCES

- Boston Borough Council (2009) *Landscape Character Assessment of Boston Borough*
- Boston Borough Council (1999) *Local Plan*
- British Standards Institute (2012) *BS 5837:2012 Trees in relation to design, demolition and construction. Recommendations*. Chartered Institute of Ecology and Environmental Management (CIEEM) (2006) *Guidelines for Ecological Impact Assessment in the United Kingdom*
- Clark, M. (2010) *Badgers*. Whittet Books, London
- East Lindsey District Council (2009) *East Lindsey District Landscape Character Assessment*
- East Lindsey District Council (1999) *Local Plan*
- English Nature (2001) Great Crested Newt Mitigation Guidelines. English Nature, Peterborough.
- Environment Agency PPG1 Pollution Prevention Guidelines
- Environment Agency PPG5 Pollution Prevention Guidelines
- Froglife (1999) *Reptile survey: an introduction to planning, conducting and interpreting surveys for snake and lizard conservation*. Froglife Advice Sheet 10. Froglife, Halesworth.
- Hundt, L. (2012) *Bat Surveys: Good Practice Guidelines, 2nd edition*, Bat Conservation Trust.
- JNCC (2010) *Handbook for Phase 1 habitat survey: A technique for environmental audit*. Joint Nature Conservancy Committee, Peterborough.
- Lincolnshire Biodiversity Partnership (2011) *The Lincolnshire Biodiversity Action Plan (LBAP) for Greater Lincolnshire, 3rd Edition, 2011-2020*.
- Natural England (2014): *National Character Area Profile 42: Lincolnshire Coast and Marshes*
- Natural England (2013): *National Character Area Profile 46: The Fens*
- Oldham R.S., Keeble J., Swan M.J.S. & Jeffcote M. (2000). *Evaluating the suitability of habitat for the Great Crested Newt (Triturus cristatus)*. Herpetological Journal 10(4), 143-155.
- Ratcliffe, D.A (1977) *Nature conservation review: The Selection of Biological Sites of National Importance to Nature Conservation in Britain*, Cambridge University Press.

- The Landscape Institute and the Institute of Environmental Management and Assessment (2013) *Guidelines for Landscape and Visual Impact Assessment, Third Edition (GLVIA3)*

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