



NORTH FALLS

Offshore Wind Farm

Outline Landscape and Ecological Management Strategy

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Glossary of Acronyms

BAP	Biodiversity Action Plan
BCT	Bat Conservation Trust
BNG	Biodiversity Net Gain
CEMP	Construction Environmental Management Plan
CIEEM	Chartered Institute of Ecology and Environmental Management
CLoWS	Candidate Local Wildlife Site
CRoW	Countryside and Rights of Way
DCO	Development Consent Order
DESNZ	Department for Energy Security and Net Zero
EclA	Ecological Impact Assessment
ECoW	Ecological Clerk of Works
EFC	Essex Field Club
EIA	Environmental Impact Assessment
EMP	Ecological Management Plan
EPP	Evidence Plan Process
EPS	European Protected Species
ES	Environmental Statement
ETG	Expert Topic Group
GI	Green Infrastructure
HDD	Horizontal Directional Drilling
IAQM	Institute of Air Quality Management
ILP	Institute of Lighting Professionals
INNS	Invasive Non-Native Species
JNCC	Joint Nature Conservation Committee
LBAP	Local Biodiversity Action Plan
LPA	Local Planning Authority
NERC	Natural Environment and Rural Communities
NFOW	North Falls Offshore Wind Farm Limited
NVC	National Vegetation Classification
OLEMS	Outline Landscape and Ecological Management Strategy
PEIR	Preliminary Environmental Information Report
RAMs	Reasonable Avoidance Measures
RAMS	Risk Assessment and Method Statement
RWE	RWE Renewables UK Swindon Limited
SEER	SEE Renewables Offshore Windfarm Holdings Limited
SSSI	Site of Special Scientific Interest
TCC	Temporary Construction Compound
UKHPI	UK Habitats of Principal Importance

Glossary of Terminology

400kV onshore cable route	Onshore route within which the onshore substation to National Grid connection point onshore export cables and associated infrastructure would be located.
Haul road	The track along the onshore cable route used by construction traffic to access different sections of the onshore cable route.
Horizontal directional drill (HDD)	Trenchless technique to bring the offshore cables ashore at the landfall. The technique will also be used for installation of the onshore export cables at sensitive areas of the onshore cable route.
Landfall	The location where the offshore export cables come ashore at Kirby Brook.
Landfall compound	Compound at landfall within which HDD or other trenchless technique would take place.
Landfall search area	The area considered at PEIR, comprising the Essex coast between Clacton-on-Sea and Frinton-on-Sea within which the landfall is located.
National Grid connection point	The grid connection location for the Project. National Grid are proposing to construct new electrical infrastructure (a new substation) to allow the Project to connect to the grid, and this new infrastructure will be located at the National Grid connection point.
National Grid substation connection works	Infrastructure required to connect the Project to the National Grid connection point.
Onshore cable route	Onshore route within which the onshore export cables and associated infrastructure would be located.
Onshore project area	The boundary within which all onshore infrastructure required for the Project will be located (i.e. landfall; onshore cable route, accesses, construction compounds; onshore substation and cables to the National Grid substation).
Onshore substation	A compound containing electrical equipment required to transform and stabilise electricity generated by the Project so that it can be connected to the National Grid.
Onshore substation construction compound	Area set aside to facilitate construction of the onshore substation. Will be located adjacent to the onshore substation.
Onshore substation works area	Area within which all temporary and permanent works associated within the onshore substation are located, including onshore substation, construction compound, access, landscaping, drainage and earthworks.
Temporary construction compound	Area set aside to facilitate construction of the onshore cable route. Will be located adjacent to the onshore cable route, with access to the highway where required.
The Applicant	North Falls Offshore Wind Farm Limited (NFOW).
The Project Or 'North Falls'	North Falls Offshore Wind Farm, including all onshore and offshore infrastructure.
Trenchless crossing	Use of a technique to install limited lengths of cable below ground without the need to excavate a trench from the surface, used in sensitive areas of the onshore cable route to prevent surface disturbance. Includes techniques such as HDD.
Trenchless crossing compound	Areas within the onshore cable route which will house trenchless crossing (e.g. HDD) entry or exit points.

1. Introduction

1.1 Project background

1. North Falls Offshore Wind Farm Limited ('the Applicant' or 'NFOW') is seeking a Development Consent Order (DCO) for the North Falls Offshore Wind Farm (hereafter referred to as 'the Project' or 'North Falls').
2. The North Falls Offshore Wind Farm is located in the southern North Sea, c. 40km from the East Anglian coast at its closest point. North Falls will be connected to the shore by offshore export cables to a landfall point at Kirby Brook, on the Essex coast. From there, onshore export cables will transport power over approximately 24km to a new high voltage alternating current (HVAC) onshore substation. The onshore substation will be constructed to accommodate the connection of North Falls to the transmission grid. A full project description is given in the Environmental Statement (ES) Chapter 5 Project Description (Document Reference: 3.1.7).

1.2 Purpose of the document

3. This document sets out the Outline Landscape and Ecological Management Strategy (OLEMS) for the Project in respect of onshore ecology, ornithology and landscape receptors. This OLEMS sets out an outline of the measures that are proposed to avoid or mitigate ecological and landscape impacts during the pre-construction, construction and operation phases of the Project, as identified through the Project's Environmental Impact Assessment (EIA).
4. This OLEMS will form the basis for a final Ecological Management Plan (EMP) and Written Landscape Scheme, which will both be prepared and submitted to the Local Planning Authority (LPA) (Essex County Council) for approval prior to construction of the Project. The EMP and the Written Landscape Scheme are secured by DCO Requirements.

1.3 Key relevant components of the Project

5. The Project's onshore infrastructure is located entirely within the Tendring peninsula of Essex and comprises transmission infrastructure required to connect the Project's offshore transmission cable to the national grid. The key components of the Project's onshore infrastructure are:
 - Landfall and associated transition joint bays;
 - Onshore export cables housed within cable ducts and associated joint bays and link boxes;
 - Onshore substation and ancillary works;
 - Connection to the national grid;

- Trenchless crossing works (e.g. Horizontal Directional Drilling (HDD));
 - Works to improve Bentley Road and provision of temporary non-motorised user route;
 - Temporary works to facilitate construction (Temporary Construction Compound (TCCs), temporary means of access); and
 - Operational accesses.
6. Optionality in the Project's design envelope has been retained at this stage, prior to detailed design. The main grid connection options considered in the Project's DCO application are:
- Option 1: Onshore electrical connection at a national grid connection point within the Tendring peninsula of Essex, with a project alone onshore cable route and onshore substation infrastructure;
 - Option 2: Onshore electrical connection at a national grid connection point within the Tendring peninsula of Essex, sharing an onshore cable route and onshore duct installation (but with separate onshore export cables) and co-locating separate project onshore substation infrastructure with Five Estuaries Offshore Wind Farm ('Five Estuaries'); or
 - Option 3: Offshore electrical connection, supplied by a third party.
7. The earliest that construction would commence under any scenario is 2027, with the onshore construction works likely to commence first.
8. Further details of the key components of offshore and onshore infrastructure can be found in ES Chapter 5 Project Description (Document Reference: 3.1.7).

1.4 Scope

9. The purpose of this OLEMS is to provide a single document that presents the outline management and mitigation measures that have been identified through the Project's EIA and that are required prior to, during and post construction of the onshore elements of the Project for onshore ecological and landscape receptors. It also provides information on any long-term management measures required to enable the reinstatement and/or enhancement of habitats.
10. This OLEMS provides details of pre-construction ecology surveys which will be required post consent in order to update the ecological baseline and inform the final EMP.
11. This OLEMS has been drafted based on the findings of pre-consent surveys undertaken between 2021 and 2023. Further information and full survey results can be found within the following documents:
- ES Appendix 23.1 Extended Phase 1 Habitat Survey Report (Document Reference: 3.3.30);
 - ES Appendix 23.2 Great Crested Newt eDNA Survey Report (Document Reference: 3.3.31);

- ES Appendix 23.3 Riparian Mammals (Water Vole and Otters) Survey Report (Document Reference: 3.3.32);
 - ES Appendix 23.4 Reptile Survey Report (Document Reference: 3.3.33);
 - ES Appendix 23.5 Hazel Dormouse Survey Report (Document Reference: 3.3.34);
 - ES Appendix 23.6 Terrestrial and Aquatic Invertebrate Survey Report (Document Reference: 3.3.35);
 - ES Appendix 23.7 National Vegetation Classification (NVC) Survey Report (Document Reference: 3.3.36);
 - ES Appendix 23.8 Bat Emergence / Re-Entry Survey Report (Document Reference: 3.3.7);
 - ES Appendix 23.9 Bat Activity Survey Report (Document Reference: 3.3.38);
 - ES Appendix 24.1 Onshore Landfall Area: 2020-21 Non-breeding Bird Surveys Report (Document Reference: 3.3.40);
 - ES Appendix 24.2 Onshore Landfall Area: 2021 Breeding Bird Surveys Report (Document Reference: 3.3.41);
 - ES Appendix 24.3 Onshore Landfall Area: 2021-22 Non-breeding Bird Surveys Report (Document Reference: 3.3.42);
 - ES Appendix 24.4 Onshore Landfall Area: 2022 Breeding Bird Surveys Report (Document Reference: 3.3.43);
 - ES Appendix 24.5 Onshore Cable Route: Non-breeding Bird Surveys 2021-22 Report (Document Reference: 3.3.44);
 - ES Appendix 24.6 Onshore Cable Route: Non-breeding Bird Surveys 2022-23 Report (Document Reference: 3.3.45);
 - ES Appendix 24.7 Five Estuaries Onshore Cable Route Breeding Bird Surveys 2022 Report (MKA Ecology) (Document Reference: 3.3.46); and
 - ES Appendix 24.8 Five Estuaries Onshore Cable Route Breeding Bird Surveys 2022 Report (Ecology Resources) (Document Reference: 3.3.47).
12. This document has been informed by the Project's Biodiversity Net Gain (BNG) Strategy (Document Reference: 7.22) and Green Infrastructure Plan (Document Reference: 3.3.39). The information presented in this OLEMS has been informed by the initial BNG assessment work undertaken on the Project's design information available at this stage, and it is recommended that the OLEMS and BNG Strategy are read in parallel for a full explanation of how BNG has been considered with the landscape and ecological mitigation measures, enhancement and net gain proposed.
13. The document has also been informed by the Project's Design Vision (Document Reference: 2.3), which has been subject to design review by the Design Council during 2023 and 2024.
14. This OLEMS should be read in conjunction with the Project's Outline Code of Construction Practice (OCocP) (Document Reference: 7.13), which provides

outline details of the environmental management measures to be implemented during the Project's construction, and which will be used as the basis of a final Code of Construction Practice (CoCP) prepared post-consent, secured by DCO Requirement.

15. Following the completion of the pre-construction surveys and the completion of detailed design undertaken post-consent, an EMP will be produced which will detail the final mitigation measures which will be adhered to during the Project's construction and operation. A Written Landscape Scheme will also be produced, which will be based on this OLEMS and which detail the landscape mitigation measures which will be implemented during the project's construction an operation. Furthermore, a BNG Assessment, based on the BNG Strategy submitted with the Project DCO application (Document Reference: 7.22) will be produced which will provided final BNG calculations and proposals for BNG based on the Project's detailed design. These three documents will all be secured via DCO Requirements.

1.5 Structure

16. This OLEMS is set out in the following structure:
 - Section Onshore Ecology:
 - Section 2.1 – Ecological Clerk of Works;
 - Section 2.2 – Pre-construction mitigation measures;
 - Section 2.3 – Construction mitigation measures;
 - Section 2.4 – Post-construction mitigation measures;
 - Section 2.5 – Long-term ecological management;
 - Section 2.6 – Biodiversity enhancements;
 - Section 2.7 – Monitoring and reporting;
 - Section 2.8 – Indicative timetable of suitable works period;
 - Section 3 - Landscape:
 - Section 3.1 – Content of the Written Landscape Scheme;
 - Section 3.2 – Landscape context;
 - Section 3.3 – Design principles;
 - Section 3.4 – Construction stage landscape and visual mitigation;
 - Section 3.5 – Operational stage landscape and visual mitigation;
 - Section 3.6 – Outline Landscape Strategy;
 - Section 3.7 – Relevant onshore archaeology and cultural heritage mitigation;
 - Section 3.8 – Landscape strategy principles;
 - Section 3.9 – Planting information; and
 - Section 3.10 – Landscape maintenance.

1.6 Content of the EMP

17. The EMP, secured by DCO Requirement, will set out full details of the ecological mitigation measures which will be adhered to during the Project's construction. This will include:
- A programme of works;
 - A list of roles and responsibilities for ecological mitigation, including the role of an ecological clerk of works (ECoW);
 - A plan showing ecological constraints;
 - Full details of good industry practice mitigation required in relation to all species and habitats affected by the Project;
 - Full details of any project-specific mitigation identified within this chapter, including habitat creation or protected species mitigation programmes. Any such programmes will be accompanied by mitigation layout plans;
 - A list of protected species licences and site consents required to facilitate construction;
 - Habitat reinstatement method statements for all habitats proposed to be reinstated following the completion of construction (including grassland, hedgerows, watercourses and arable field margins – see below); and
 - Any associated standalone mitigation plans, e.g., reptile precautionary method of working, invasive species management plan, etc. as required.

2. Onshore Ecology

2.1 Ecological Clerk of Works

18. All of the ecological work described in the final EMP will be undertaken under the guidance of the appointed North Falls lead Ecological Clerk of Works (ECoW).
19. Site inductions and toolbox talks for all site personnel will include reference to the requirements of the EMP and CoCP. The lead ECoW will undertake, or delegate, the following tasks:
- Arrange any specialist ecological surveys required immediately prior to, or during construction;
 - Undertake regular ecological site inspections;
 - Assist (where deemed necessary) the Principal Contractor in delivering site inductions and toolbox talks (i.e. presentations and the dissemination of information to site personnel on ecological matters). All briefings will include reference to the requirements set out in the EMP. The site-wide ecological requirements will be explained within these briefings. Additional toolbox talks may also be provided for each new area of works to ensure that area-specific requirements are fully understood and implemented;

- Assist in reviewing Risk Assessments and Method Statements (RAMS); and
 - Notifying the Principal Contractor of any issues/breaches in the EMP and/or CoCP.
20. Given the scale of the project it is anticipated that an ECoW team would be required, with the lead ECoW delegating duties to an appropriately skilled and experienced deputy/ assistant ECoW(s), where necessary. The lead ECoW would be expected to have a minimum of three years' experience as a professional ecologist including suitable ECoW experience, preferably on large linear infrastructure projects with knowledge of UK ecological policy and legislation. The lead ECoW would be a member or an appropriate professional body, in the case of the Chartered Institute of Ecology and Environmental Management (CIEEM) this would be Associate grade (ACIEEM) or above. They would also hold a Construction Skills Certification Scheme (CSCS) card (or equivalent). Deputy/ assistant ECoWs would also be expected to possess a suitable qualification and/or relevant professional experience.
 21. All site personnel will be briefed on the role and responsibility of the ECoW team. Contact details for the lead ECoW and any deputy/ assistant ECoWs would be provided within the EMP and will be made available to site workers and contractors. A copy of the EMP will be kept on site at all times and site workers would be made aware of its location along with the details of the person to contact in order to obtain a copy.
 22. The ECoW and any deputy/ assistants will be appointed either by the Principal Contractor or by the Applicant to oversee onshore site preparation and construction works. It is also possible that separate ECoW will be appointed by the Principal Contractor and the Applicant, with each ECoW performing different roles.
 23. Any known breaches of the requirements documented within the EMP will be reported to the lead ECoW by the Principal Contractor or site personnel (either directly or through the Principal Contractor) as soon as practicable. Should it become evident to the ECoW that a breach of the requirements of the EMP has occurred, the ECoW will be responsible for reporting this breach to the responsible NFOW Onshore Environmental Manager and Site Manager. Where necessary, the responsible Onshore Environmental Manager and Site Manager would report any breaches to the relevant authorities.
 24. The ECoW will be responsible for developing an appropriate ecology and nature conservation incident response plan for any breach of the EMP, should an ecological incident occur. The NFOW Onshore Environmental Manager would ensure that any remedial measures proposed are communicated and where required, approved by the relevant LPA (Essex County Council). Where appropriate Natural England would be consulted to obtain their agreement for any remedial measures that may be required, as would the Environment Agency specifically in relation to wetlands and watercourses.
 25. The final EMP would be a live document and the ECoW would be responsible for reviewing and updating the EMP, ensuring that the Principal Contractor and all site personnel are aware of the latest version.

2.2 Pre-construction mitigation measures

26. This section describes the ecological mitigation measures that would be undertaken prior to the commencement of construction to ensure the protection of ecological receptors.

2.2.1 General pre-construction measures

27. Due to the mobility of species and the period of time which will have lapsed between the pre-application surveys and the start of construction, all features surveyed during the pre-application survey effort will be re-surveyed, where necessary, in accordance with industry guidance and methodology (i.e. following the approach used during pre-application surveys, or updated best practice at that time).
28. It is possible that additional ecological receptors may be recorded during these pre-construction surveys. Where this occurs, the EMP will be reviewed and updated to include measures for such receptors where appropriate. All pre-construction surveys will be undertaken by appropriately experienced and, where necessary, licensed ecologists. All surveys will be carried out in accordance with bio-security risk assessments and safe systems of works (i.e. RAMS), which will be produced by the appropriately experienced surveying ecologists and subsequently approved by the Applicant, prior to the commencement of a survey.
29. Table 2.1 presents an indicative list of the pre-construction surveys that will be undertaken alongside each optimal survey period, compared to the surveys carried out prior to consent.
30. The requirement for, and scope of, updated surveys will be dependent on the time elapsed since previous surveys and the extent of any change to supporting habitats, which will be informed through an updated preliminary ecological appraisal (PEA) survey of the onshore construction footprint (including appropriate species-specific buffers).

Table 2.1 Pre-construction ecological survey requirements

Baseline survey	Survey area	Survey timing	Survey required pre-construction?	Justification
Extended Phase 1 Habitat survey	Habitats within and up to 50m of the onshore project area.	March - October	No	The proposed mitigation is not expected to change as a result of updated surveys.
Badger surveys	Habitats within and up to 50m of the onshore project area.	Any time of year	Yes	New badger setts may have established since the pre-consent baseline surveys; thus this could have implications as to the mitigation, in particular, licensing required by the Project.
Great crested newt eDNA surveys	All suitable ponds within and up to 250m of the onshore project area.	March - June	No	The use of District Level Licensing negates the need for further surveying.
Riparian mammal surveys	All sui waterbodies within and up to 50m of the onshore project area.	March – September for water vole Any time of year for otter	Yes	New otter holts and water vole burrows may have established since the pre-consent baseline surveys; thus this could have implications as to the mitigation, in particular, licensing required by the Project.
Reptile surveys	All suitable habitat mosaics within and up to 50m of the onshore project area.	May – June and September - October	Yes	Surveys would be required to understand the current population size / distribution, confirm the need for translocation, identify a suitable translocation site which provides the correct habitat features for the populations to be translocated (if required) and identify the appropriate duration of trapping days required for translocation.
Hazel dormouse surveys	All suitable habitats within and up to 50m of the onshore project area.	April - November	Yes	New hazel dormouse nests may have established since the pre-consent baseline surveys; thus this could have implications as to the mitigation, in particular, licensing required by the Project.
Terrestrial and aquatic invertebrate surveys	All suitable habitats within Holland Haven Marshes Site of Special Scientific Interest (SSSI).	May - September	No	Impacts are avoided at the Holland Haven Marshes SSSI.
NVC surveys	All habitats within Holland Haven Marshes SSSI.	April - August	No	Impacts are avoided at the Holland Haven Marshes SSSI.

Baseline survey	Survey area	Survey timing	Survey required pre-construction?	Justification
Bat emergence/ re-entry surveys	Suitable roosting features within and up to 50m of the onshore project area.	April - October	Yes	New bat roosts may have established since the pre-consent baseline surveys; thus this could have implications as to the mitigation, in particular, licensing required by the Project.
Bat activity surveys	All suitable habitats within and up to 50m of the onshore project area.	April - October	No	The proposed mitigation is not expected to change as a result of updated surveys.
Breeding bird surveys	All suitable habitats within and up to 50m of the onshore project area.	March - August	Yes (breeding bird checks)	New bird nests may have established since the pre-consent baseline surveys; thus this could have implications as to the mitigation, in particular, licensing required by the Project.
Non-breeding bird surveys	All suitable habitats within the onshore project area.	October - March	No	The proposed mitigation is not expected to change as a result of updated surveys.

31. In addition to the survey updates, a tree survey will be undertaken by an appropriately qualified arboriculturist. The survey will also be accompanied by an Arboricultural Impact Assessment (AIA) will be undertaken to assess the quality of the existing trees along the length of proposed onshore cable route. All reports and plans will comply with '*British Standard 5837:2012 Trees in relation to design demolition and construction – Recommendations*' and should provide details on all existing trees and vegetation to be retained and/or removed to facilitate the Project, outlining any arboricultural impacts and constraints. This will identify any trees within the onshore project area that would pose a constraint to the Project and if they are of sufficient quality to merit protection and/or retention. An Arboricultural Method Statement (AMS) and associated tree protection plans (TPP) will be required to ensure retained vegetation is adequately protected throughout the course of the Project's construction. The tree survey report, AIA, AMS and TPPs will be appended to the EMP and submitted to and agreed with the LPA (Essex County Council) prior to the commencement of any construction works.
32. Prior to construction, the arable field margins will be re-surveyed to assess their conservation value and to inform habitat reinstatement. Further information related to habitat reinstatement can be found in Section 2.5.1.

2.2.2 Habitats

2.2.2.1 Protective Buffer Zones

33. The EMP would specify protective buffer zones around key retained habitats (e.g. woodland, veteran trees, ponds, important grasslands and sections of watercourses). These would be specified in the EMP and relevant construction drawings, with reference to other appropriate documents, including TPPs which would be derived from the AIA and assessment undertaken post-consent, CoCP and standard industry guidance (e.g. BS5837:2012). No works would be undertaken within these buffer zones, which would be maintained throughout the construction period.
34. A 15m buffer zone will be in place surrounding most areas of ancient woodland to avoid direct impacts during construction. A buffer of at least 10m will also be in place around Holland Mill Wood.
35. No specific protective buffer zones will be put in place around UK Habitats of Principal Importance (UKHPI), however protective fencing will be installed around retained UKHPI located directly adjacent to working areas.
36. Additional buffer zones, where required, would be identified by the ECoW around habitat features of value to protected species.
37. All buffer zones would prohibit the tracking of heavy vehicles, and the storage of vehicles, machinery, equipment and soils. Buffer zones would be clearly marked out as specified in the TPP (e.g. using Heras fencing or equivalent) or using high-visibility Netlon fencing or coloured tape, and/or signs describing the prohibitive requirements of the zones would be installed at appropriate locations. Where necessary, specific locations and any requirements would be discussed on site.

38. Pre-construction measures in respect of protected and notable species would be specified in the EMP. Key measures are set out below.

2.2.3 Protected and notable species

2.2.3.1 Birds (*wintering and breeding*)

39. The key mitigation measures for birds will comprise:

- Where practicable, works will aim to be scheduled to avoid the breeding bird season (March – September inclusive, although weather dependent) in order to negate potential disturbance of nesting birds. Where this cannot be achieved, all nesting bird habitat would be subject to pre-construction checks by the ECoW (or a suitably experienced ornithologist, where the task is delegated) for the presence of active birds' nests no more than 48 hours prior to removal. Should a nest be found, a buffer zone (minimum 5m, species-dependent) around the nest must be created, and no works must be undertaken within the buffer zone until the young have fledged and/or nest is no longer active. For Schedule 1 listed bird species, further mitigation measures may be required to avoid disturbance to breeding adults, as advised by the ECoW or ornithological expert.
- The buffer zones around active bird nests would be based on species type and sensitivity (advice on this being provided by the ECoW or a suitably experienced ornithologist) but would be at least 5m and marked out to prevent accidental disturbance (advice on the most appropriate technique for the species and location being provided by the ECoW or a suitably experienced ornithologist).
- Measures would be adopted to minimise noise, light and disturbance on identified breeding birds, such as visual screening (e.g. opaque fencing) where necessary. Lighting will be cowled and angled downwards and does not shine directly on sensitive habitats. Lighting is motion activated to minimise unnecessary lighting;
- Construction activities would be monitored by an ECoW or suitably qualified ornithologist, who would seek to ensure compliance with the Wildlife and Countryside Act 1981 (as amended), e.g. by avoiding destruction of nests, eggs or young, and affording increased protection from disturbance to any Schedule 1 species of breeding birds.
- Where breeding bird activity is recorded, all construction works (excluding vehicle and personnel movements) within that area may be halted immediately until a disturbance risk assessment is undertaken by the ECoW or a suitably experienced ornithologist. The risk assessment would consider the nature of construction activity, likelihood of disturbance, and possible implications of the construction activities on the breeding attempt and set out measures to ensure that no disturbance occurs. Where it is determined that breeding birds are not likely to be affected, construction works would continue. Where it is determined that breeding birds may be affected, additional mitigation works would be implemented to prevent disturbance. Where, in the opinion of the suitably qualified ecologist,

disturbance cannot be avoided by mitigation, construction works within the area of disturbance would be suspended until chicks have fledged.

40. The ECoW will maintain a record of all pre-construction bird nest surveys undertaken. The record will be provided to the NFOW Onshore Environmental Manager, and a copy will be made available to relevant stakeholders upon request.

2.2.3.2 *Bats*

41. Pre-construction surveys will be undertaken in advance of works commencing to identify the location of any active bat roosts. Trees within and up to 50m of the onshore project area will be re-assessed for their suitability to support roosting bats prior to construction start, as the potential roost features on trees are likely to change and new features can form overtime due to weather effects and natural processes, such as tree decay. Trees with bat roost potential will then be subject to further survey in or to determine presence / likely absence of roosts. Surveys will be conducted in accordance with best practice guidelines and once completed, a roosting bat impact assessment will be completed. Survey methods include, but are not limited to, endoscope and tree climbing by a bat licenced ecologist.
42. A report of the pre-construction bat survey findings and recommendations would be produced by the suitably qualified and bat licensed ecologist and provided to the NFOW Onshore Environmental Manager. The report will be appended to the EMP, and would also be made available to relevant stakeholders, upon request.
43. Hedgerow removal will be programmed for winter where practicable, to give bats time to adjust to the change prior to the maternity period. Hedgerows will be removed in the preceding winter as close to the onset of works as practicable and works will not commence after nights of poor weather (in case of bad weather roosts being used).
44. Where existing habitats are located adjacent to the onshore project area, these areas will be retained and protected from damage where practicable, using fencing.
45. All trees with 'low' bat roost potential, as classified in accordance with Bat Conservation Trust (BCT) guidelines (Collins, 2023), would be soft-felled, as would any trees with 'high' or 'moderate' bat roost potential where targeted surveys had found no evidence of roosting bat presence. Trees with 'negligible' roost potential will not need to be soft-felled. Soft-felling will likely be included (amongst other mitigation measures) within the method statement of any bat European Protected Species (EPS) mitigation licences to fell any trees in which roosting bats have been confirmed to be present, although this will be determined on an individual (per tree) basis depending on the nature of the roost feature. Trees with 'high' or 'moderate' bat roost potential which have been found (through targeted surveys) to support no roosting bats will still be soft-felled as a precaution, although this would not need to be done under licence given that appropriate surveys would have confirmed no roosting bat presence. Soft-felling involves severance of the feature with bat roost potential (e.g. a limb with a niche in it, or a part of a tree trunk with a woodpecker hole in it, for example) from the tree structure, without damaging the potential roost feature

itself, and gentle lowering to the ground, typically using ropes. The severed limb/tree part is then left on the ground overnight, with the intact potential roost feature facing sideways/upwards (not facing into the ground) so as to allow any bats present to emerge. All tree surgeons would be briefed on this approach prior to commencing works on relevant trees.

46. Where roosts of low conservation significance are lost to the Project, bat boxes will be installed as mitigation. The type of bat box needed will depend on the species found in the onshore project area, and these will be determined once pre-construction surveys have been concluded.
47. Confirmed roosting sites that cannot be retained will be removed pre-construction, in line with a Natural England EPS mitigation license method statement and BCT best practice guidelines (Collins, 2023): gently taking down the tree in sections and leaving them on the ground for 24 hours to allow any bats to vacate the feature(s).
48. A Natural England licence return form and report of the works undertaken would then be completed by the suitably qualified and bat licenced ecologist (e.g. the bat licence holder). A copy of this form and report would be provided to Natural England and the LPA (Essex County Council) as soon as reasonably practicable, and as prescribed by the conditions of the Natural England development licence.

2.2.3.3 *Badgers*

49. A pre-construction badger survey will be undertaken across the onshore project area plus a 30m buffer zone, to confirm the status of badgers prior to works commencing in order to confirm whether there have been any changes to the site conditions recorded during the pre-consent surveys, as well as noting any new badger setts that have been excavated. All pre-construction surveys will be undertaken sufficiently in advance of the commencement of works to ensure that should there be the potential that construction works will directly affect an active sett, a licence will be required from Natural England before works can commence.
50. A report of the pre-construction badger survey findings and recommendations would be produced by the suitably qualified ecologist and provided to the NFOW Onshore Environmental Manager. The report will be appended to the EMP, and would also be made available to relevant stakeholders, upon request.
51. If the pre-construction surveys identify areas of key commuting value for badgers (such as well-worn paths connecting setts or foraging grounds) which would be bisected by the onshore project area, warning signs would be installed and reduced speed limits for construction vehicles would be implemented to address increased risk of road traffic accidents with badgers.
52. Where active badger setts are identified but works can be maintained at least 30m away (e.g. where a Natural England licence is not required as works are located out of the 30m buffer zone), the ECoW would ensure that a 30m buffer is set up around those active setts. No works would be undertaken within this 30m buffer unless advised to be acceptable by the ECoW.

53. If an active badger sett needs to be closed to facilitate construction, then a mitigation licence will be sought from Natural England. Mitigation within a Natural England development licence for badgers may require:
- Main sett replacement in the proposed Mitigation Areas and closure under licence;
 - A replacement sett must be in place in advance of closure of existing sett, and badgers must have used the artificial sett;
 - Sett closure can only occur between 1 July and 30 November;
 - If it is a main sett, proof of discovery of the artificial sett is required prior to closure of the main sett; and
 - Bait marking surveys may be required to ensure the artificial sett is not being built in another clan's territory.
54. If required, a Natural England licence return form and report of the works undertaken will be completed by the ECoW. A copy of this form and report will be provided to Natural England as soon as reasonably practicable and as prescribed under the conditions of the licence. Once the licence has been obtained, the works would need to be carried out in accordance with the requirements of the licence and supervised by the ECoW.

2.2.3.4 Otter and water vole

55. A pre-construction survey will be undertaken prior to construction to confirm the presence/absence of water voles and otters within the onshore project area. This pre-construction survey will include re-appraising all watercourses within the onshore project area, as part of the updated PEA survey. Any watercourses which are found to provide suitable habitat for otter and/or water vole and which are due to be directly impacted (i.e. through open-cut installation of the onshore export cables) will be the subject of detailed field surveys as part of the pre-construction surveys. No pre-construction surveys are proposed for watercourses which are to be crossed using trenchless techniques.
56. A report of the pre-construction otter and water vole survey findings and recommendations would be produced by the suitably qualified ecologist and provided to the NFOW Onshore Environmental Manager. The report will be appended to the EMP, and would also be made available to relevant stakeholders, upon request.
57. Subject to the results of any pre-construction otter and water vole surveys, if required an application to Natural England for the required licence(s) would be submitted. No works would be undertaken affecting these species until the licence(s) is in place, and works would be undertaken in accordance with the licence method statement(s).
58. Based on the findings from the pre-consent survey results detailed in ES Appendix 23.3 (Document Reference: 3.3.32), there is no specific licence requirements for otter or water voles at this stage. However, general mitigation measures that will be implemented during the works include:
- Night-time working near watercourses would be avoided or minimised as far as possible; and

- Exit ramps from excavations near watercourses would be provided at night, so to provide otter/water vole with an escape route and to avoid entrapment.
59. If water vole presence is confirmed during the pre-construction surveys the following measures would be considered. It is envisaged that dissuasion techniques (e.g. strimming of vegetation to encourage water voles to move out from the working area) and exclusion fencing would be used to ensure water voles are not harmed by the Project. Displacement works are recommended to be carried out between February and April and where sufficient available alternative habitat exists. Regular repeat strimming would be undertaken to maintain the habitat's unsuitability for water voles.
 60. Trapping and translocation of water voles, if required, should be completed between February and April and under a Natural England licence. A suitably qualified ecologist would be responsible for ensuring a Natural England licence application is submitted to Natural England prior to the commencement of works. A works-free buffer zone of at least 15m would be established around watercourses supporting water voles until a Natural England licence has been obtained.
 61. A licence application would be informed by any prior surveys and would contain a detailed method statement and mitigation plan. Licenced works would be carried out under a water vole watching brief, supervised by the suitably qualified ecologist who holds the water vole licence.
 62. A suitably qualified ecologist would be responsible for producing a licence return form and report of works carried out under licence. A copy of this form and report would be provided to Natural England and the LPA (Essex County Council) as soon as reasonably practicable and as prescribed under the conditions of the Natural England licence.

2.2.3.5 Reptiles

63. A pre-construction survey will be undertaken to understand the current population size / distribution, identifying a suitable translocation site which provides the correct habitat features for the populations to be translocated and identifying the appropriate duration of trapping days required for translocation.
64. A report of the pre-construction reptile survey findings and recommendations would be produced by the suitably qualified ecologist and provided to the NFOW Onshore Environmental Manager. The report will be appended to the EMP, and would also be made available to relevant stakeholders, upon request.
65. For those habitat mosaics which support 'good' populations of reptiles, which are directly affected during construction, a reptile translocation programme will be undertaken where necessary. This will be included in the EMP and supervised by an ECoW. The translocation programme will follow Natural England's *Reptiles: advice for making planning decisions* (2022) and the *Herpetofauna Worker's Manual* (Gent and Gibson, 2003). Once trapping is complete the site will be cleared using a precautionary method of working to minimise potential impacts upon any remaining individuals.
66. If habitat is cleared during the reptile hibernation period (which is typically between November and February inclusive, dependent on local weather

conditions), then trees and scrub would only be cut to approximately 30cm above ground-level. This is to minimise the potential for disturbance to root balls where hibernating reptiles may be located. Remaining rough grass cover would be mowed short (approximately 5cm to 10cm above ground-level) and maintained at this height prior to clearance for construction works. This phased clearance would encourage reptiles to move away from the working area before ground clearance and construction works commence. This clearance will deter reptiles and reduce the requirement for the need for reptile fencing to be installed prior to the hibernation season.

67. Above ground vegetation removal will be avoided during the reptile active period (March – October inclusive) wherever practicable and avoiding undertaking below ground vegetation removal e.g., roots and coppice stools during the reptile hibernation period (November – February inclusive) where practicable. If not practicable, above ground vegetation identified as suitable to support reptiles removed during the reptile active period must be done so whilst adhering to a precautionary method of working (PMoW) for reptiles, supervised by a suitably qualified ecologist.
68. A PMoW for vegetation removal will involve cutting vegetation to a minimum height of 150mm, allowing reptiles to vacate the area, allowing the ECoW (or a suitably qualified ecologist, where the task is delegated) to search for any reptiles, then once cleared further cutting can take place. For any reptiles found during construction, a suitable translocation area will be decided upon to re-release the reptiles away from construction activities. The PMoW would be provided as an appendix to the final EMP.
69. Areas would be maintained in a condition not favoured by reptiles (e.g. with minimal ground cover) until the commencement of construction, through regular mowing of ground vegetation.
70. If habitat clearance for reptiles is to be undertaken during the breeding bird season, habitats of potential value to nesting birds would be surveyed as described above, allowing any active bird nests to be located.
71. The EMP would include details of measures to avoid killing/injury of reptiles during construction. No works (e.g. site clearance) likely to impact areas where reptiles are present would be undertaken, until required measures (e.g. displacement or exclusion, or capture and translocation, under supervision of the ECoW) are in place.
72. A record of works will be maintained by the ECoW and a copy of this record will be made available to the LPA (Essex County Council) on request

2.2.3.6 Great-crested newts

73. As part of embedded mitigation during ongoing Project design refinement, the Project has sought to avoid standing water bodies as far as practicable.
74. Embedded mitigation for impacts to great crested newts is via project siting and design. The embedded measures which are pertinent to great crested newts include retention of all ponds with the potential to support great crested newts, with trees and hedgerows retained wherever practicable. Additional key principles that will be followed in order to mitigate for impacts are described below.

75. North Falls propose to ensure appropriate mitigation for impacts upon great crested newts through Natural England's District Level Licensing (DLL) scheme for Essex. This scheme is designed to allow developers to pay for off-site compensation as an alternative to undertaking detailed on-site surveys and applying for a mitigation licence. This ensures that money which would have been spent on costly mitigation is better spent in targeted improvement to the district great crested newt population. Consultation with Natural England regarding the proposal and the viability of using the scheme for North Falls has taken place to date as part of the evidence plan process. It is proposed that North Falls will enter into the scheme in advance of DCO award, with a formal submission for a DLL being made post-consent.
76. However, the Applicant is committed to going beyond the requirements of the DLL during pre-construction activities and will be applying a number of techniques to reduce the risks of impacting individual great crested newts, collectively termed 'Reasonable Avoidance Measures' (RAMs). These RAMs would be captured under a great crested newt PMoW which would be included in the final EMP. The great crested newt PMoW would include measures such as:
- Phased vegetation clearance, as described for reptiles above;
 - Rubble or log piles present within the construction footprint to be disassembled and moved during the newt active season (March to October inclusive);
 - Storage of materials that might act as a refuge for newts on hard standing or previously cleared ground; and
 - Excavations and working areas to be managed so as not to create temporary waterbodies which may attract newts.

2.2.3.7 Hazel dormice

77. All hedgerows and woodland areas suitable for hazel dormice will be subject to pre-construction surveys. The pre-construction survey will comprise of a nest-tube monitoring survey of suitable hedgerows, and a nest box survey of all suitable woodlands. The survey would be undertaken in accordance with good industry practice methods from *The Dormouse Conservation Handbook* (Bright, Morris and Mitchell-Jones, 2006). If dormouse nests are confirmed within hedgerows due to be removed, Natural England licensing will be sought prior to the commencement of works.
78. If pre-commencement/ pre-construction surveys or ECoW pre-clearance checks conclude the species is present and there is potential for the detailed design to affect dormouse, then mitigation for temporary habitat loss and disturbance may include:
- Creation of temporary compensation/ mitigation habitats for use by dormice in immediately adjacent areas. Where practicable, additional feeding sites and nesting boxes would be installed in hedgerows and woodland edges outside of the onshore project area, to accommodate for any hazel dormice disturbed by noise (Bright, Morris and Mitchell-Jones, 2006);

- Scheduling of certain work to avoid sensitive periods of the dormouse life cycle; standard practice would be followed i.e., a two-stage removal. Top growth of the hedgerow would be removed in the winter months (November – February) when dormouse are hibernating, avoiding ground disturbance. Clearance of stumps, roots and other vegetation would be undertaken from May – September thereafter;
 - Deterrence from areas where there is risk of injury or death in advance; and
 - Reinstatement of hedgerow habitats immediately after construction.
79. Trenchless techniques will be used for cable route installation works under all hedgerows which have confirmed dormice presence, and where practicable also under those identified as suitable to support dormice.
80. For the two hedgerows where small-scale hedgerow removal is required, the hedgerow is recommended to be cleared during the hibernation period (November to March inclusive) to avoid the risk of killing or injuring individuals during clearance works.
81. In order to mitigate the effects of habitat fragmentation, temporary hedgerows would be put in place across the gap during the active season (April to October inclusive). These temporary hedgerows would be taken down during the day to allow vehicles to use the haul road, and put back in place overnight when the dormice are active. They would consist of 'dead hedges', or containerised hedges, with the final proposed method being detailed within the EMP.

2.2.3.8 Invasive non-native species

82. Known locations of Invasive Non-Native Species (INNS) should be avoided by construction works in order to limit their spread.
83. Where avoidance is not feasible, they will be removed and disposed of appropriately (e.g. as part of pre-construction vegetation removal works). The implementation of control measures will be detailed in the CoCP, an outline version of which will be submitted with the DCO application (Document Reference: 7.13), including species specific removal methodologies.
84. Prior to the commencement of construction works, an INNS Management Plan would be developed and appended to the EMP. This plan will likely include the following measures:
- A plan of all INNS locations and extents;
 - A protocol for removing INNS and or managing the waste generated;
 - All machinery to be cleaned and inspected prior to working on the onshore project area, as biosecurity measure to prevent to introduction of any INNS species;
 - Good site practice measures for managing the spread of INNS during works at watercourses; and
 - A requirement for the ECoW to hold responsibilities in relation to INNS, and details of these responsibilities.

2.3 Construction mitigation measures

85. This section describes the ecological mitigation measures that would be undertaken during the construction phase of the Project to ensure the protection of ecological receptors.

2.3.1 General construction measures

86. All construction would be undertaken in accordance with the EMP and CoCP (see the OCoCP (Document Reference: 7.13)). Measures that will be specified in the CoCP will include:

- All works would be carried out taking full account of legislative requirements and Environment Agency (EA) guidance;
- Staff toolbox talks on pollution prevention and spill procedures;
- Appropriate and adequate measures would be in place to ensure levels of dust are controlled to avoid effects on important ecological features;
- Appropriate and adequate measures would be in place to minimise surface water flooding;
- Noise and vibration levels would be controlled to avoid effects on important ecological features;
- Storage of the excavated subsoil separately from the topsoil, with sufficient separation to ensure segregation; and
- Restricting movement of heavy plant and vehicles to specified routes.

87. Working hours are 07:00 – 19:00 Monday to Saturday, and night working is not scheduled as part of the normal construction working hours and may only be undertaken for specific activities (e.g. for trenchless crossing operations, which once started cannot be halted until complete).

88. Where night working is unavoidable, or lighting is required for security/health and safety reasons, light fixtures would be directed towards working areas and away from adjacent or nearby habitats of value to protected or notable species. Any security lighting would be motion activated on short timers. Any such installations would be specified in the CoCP and inspected by the ECoW for compliance.

2.3.2 Habitats

89. All protective buffer zones described within Section 2.2.2, would be maintained throughout the construction phase. This would include the adherence and implementation of the protocols to manage the potential accidental release of lubricants, fuels and oils from construction machinery and trenchless crossing operations should there be a release/break-out of inert drilling fluids.

90. The ECoW would monitor adherence to the requirements of the buffer zones a minimum of once every two weeks and would maintain a record of all findings and site checks undertaken. Should any breach of the requirements become evident, the ECoW would advise what remedial measures are required to be

undertaken as soon as practicable to resolve the situation and minimise effects on ecology.

91. Trenchless crossings, such as HDD, would be used where practicable to avoid the need for hedgerow removal.

2.3.2.1 *Trenchless crossing*

92. Full details as to the locations where trenchless techniques such as HDD have been committed to are set out in ES Appendix 5.1 Crossing Schedule (Document Reference: 3.3.2).
93. Where possible trenchless crossings will be used to prevent loss and impacts on the hedgerows. However, in the worst-case scenario, based on the Project's outline design 12 hedgerows within the onshore project area could be crossed using open cut trenching. Hedgerow removal will not exceed a 30m swathe at each trenched hedgerow crossing along the onshore cable route.
94. As referenced in the OCoCP (Document Reference: 7.13), trenchless crossing techniques such as HDD have been committed to where the onshore cable route crosses all main rivers to avoid direct interaction with these watercourses. Although ground disturbance will occur at the trenchless entry and exit points, there would be no direct disturbance to the watercourses crossed using trenchless techniques. Therefore, there is no direct mechanism for impacts to occur to the geomorphology, hydrology, and physical habitats of these watercourses. Appropriate hydrological pollution prevention measures will also be adopted (as outlined in the OCoCP).
95. At all trenched watercourse crossings, good industry practice measures will be in place to minimise disturbance of the beds, banks and downstream habitats (see ES Chapter 21 Water Resources and Flood Risk (Document Reference: 3.1.23)). Where temporary dams are used:
 - The onshore export cables would typically be a minimum of 3 m below the channel bed (dependent on local geology and geomorphological risks). This would avoid exposure during periods of higher energy flow when the bed could be mobilised. This depth takes into consideration anticipated climate-change related changes in fluvial flows and erosion that will occur over time;
 - The amount of time that temporary dams or flumes are in place will be kept to a reasonably practicable minimum;
 - Flumes or pumps would be adequately sized to ensure that flows downstream are maintained whilst minimising upstream impoundment;
 - Scour protection would also be used to protect the river bed downstream of the dam from high energy flow at the outlets of flumes and pumps;
 - If a diversion channel is required, geotextiles or similar techniques will be used to line the channel and prevent sediment entering the watercourse;
 - Vegetation would not be removed from the banks unless necessary to undertake the works, in which case removal would be restricted to the smallest practicable footprint;

- Channel bed and banks would be sympathetically reinstated (e.g. by replacing re-sectioned banks with more natural profiles that are typical of the natural geomorphology of the watercourse); and
 - Prior to dewatering the area between the temporary dams, a fish rescue would be undertaken.
96. For watercourses potentially requiring the construction of a 6m wide haul road crossing, which could affect the flow and integrity of the watercourse, the construction techniques will ensure that water flow is maintained and that risk of release of pollutants and sediment is minimised as far as practicable. Reinstatement and monitoring of habitat will take place post-construction.
97. Direct loss of woodland habitats and veteran trees will be avoided by using trenchless techniques (e.g. HDD) to install cable ducts at all locations where woodland is encountered along the onshore cable route.
98. Embedded mitigation relating to the trenchless crossing design and break-out contingency planning will be implemented to minimise the risk of effects on habitats. Details as to how the HDD will be undertaken safely to reduce risk of break-out and management of break-out should it occur are detailed in Outline Horizontal Directional Drill Method Statement and Contingency Plan has been provided with the DCO application (Document Reference: 7.15).

2.3.3 Designated sites

99. The landfall compound will be located within an agricultural field supporting modified grassland that also constitutes the Section 41 (S41) (of the Natural Environment and Rural Communities (NERC) Act 2006) priority habitat coastal and floodplain grazing marsh, located immediately adjacent to, but outside of the Holland Haven Marshes SSSI. The following measures are proposed to protect the SSSI and its notified features:
- Use of HDD avoids direct impacts on saltmarsh habitats of Holland Haven Marshes SSSI and LNR; and
 - A 20m standoff buffer zone will be in place for works on the north side of the Holland Haven Marshes SSSI.

2.3.4 Protected and notable species

100. The following measures in respect of protected and notable species would be implemented during the Project's construction, in accordance with the EMP.
101. The following protected species methods statements will be produced as part of the final EMP:
- Reptile PMoW;
 - Great crested newt PMoW; and
 - INNS management plan.
102. If other species-specific method statements are required following the completion of pre-construction surveys, these will also be included.

2.3.4.1 *Protected species licensing*

103. Based on the baseline data collected to date, the only protected species licence required by the Project is a great crested newt District Level Licence (DLL). The DLL scheme is designed to allow developers to pay for off-site compensation as an alternative to undertaking detailed on-site surveys and applying for a mitigation licence. This ensures that money which would have been spent on costly mitigation is better spent in targeted improvement to the district great crested newt population. Consultation with Natural England regarding the proposal and the viability of using the scheme for North Falls has taken place to date. NFOW are in the process of entering the scheme in advance of DCO award, with a formal application for a DLL being made post-consent.
104. Following the pre-construction surveys, the protected species licence requirements for the Project will be reassessed ahead of construction.

2.3.4.2 *Birds (wintering and breeding)*

105. All works would be undertaken in accordance with the EMP and CoCP (see the OCoCP (Document Reference: 7.13)). In the event that additional vegetation clearance is required in areas that are likely to support nesting birds, this would be undertaken outside of the bird nesting season (March to the end of August), or subject to inspection by the ECoW.
106. If active birds' nests are found during construction, the same approach as that set out in Section 2.2.3.1 will be carried out to negate any disturbance on nesting birds during construction.
107. A number of barn owl nest boxes are located within and surrounding the Holland Haven Marshes SSSI. Occupancy and breeding success of these is likely to have reduced over time due to the deterioration of the wood constructions and occupation by jackdaws in some of them. Effort would be made in consultation with the Essex Wildlife Trust, Tendring District Council and Natural England, to repair or replace existing nest boxes, or add new ones in suitable locations across the onshore project area to enhance nesting conditions, and ultimately increase the productivity of the local breeding population.
108. Soft landscaping works committed to within the onshore substation works area will be designed to be sympathetic for the year-round habitat requirements of grey partridge and nesting skylark, by providing hedgerows and tree planting with thick, grassy cover on low banks for nesting and semi-improved grassland for chick-rearing.
109. Although the presence and distribution of quail may vary each year in response to agricultural land use changes, if construction activity is likely to occur during the breeding season within the 27ha field where quails were recorded in 2022 (ES Figure 24.23 (Document Reference: 3.2.20)), provisions would be made to ensure that the field (or adjacent field within the onshore project area) remains suitable for breeding. This would be achieved by enhancing the areas of unfarmable land in the field so that they provide suitable habitat, for example the growth of permanent (e.g. retained from the previous year), tall and dense vegetation (cereal, linseed and/or grassland).
110. Measures will be adopted to seek to minimise noise, light and disturbance on key aggregations of non-breeding birds, such as: keeping existing hedgerows

and vegetation for visual screening, or the installation of additional solid or acoustic fencing around compounds or noisy plant where considered necessary. This is of particular relevance to the landfall HDD works near the Holland Haven Marshes SSSI.

111. Construction activity in important areas for non-breeding Important Ornithological Features (IOFs) (e.g., the two agricultural reservoirs near Thorpe-le-Soken used by green sandpipers) would be monitored by the ECoW and should it be determined that construction activities may impact upon non-breeding birds inasmuch as to them affecting survival rates, additional mitigation would be deployed, and may include measures such as avoidance of work around dawn and dusk, high tides, or extended periods of cold weather.

2.3.4.3 Bats

112. All works affecting confirmed bat roosts confirmed during pre-construction surveys would be undertaken in accordance with a Natural England bat mitigation licence and the EMP.
113. Should a new bat roost be located during construction, works within 15m of the roost will be halted immediately and site workers will inform the ECoW as soon as practicable, either directly or through the Site Manager. Any potential construction lighting in nearby areas will be directed away from the roost site.
114. Mitigation in relation to new roosts identified during construction will follow that set out in Section 2.2.3.2.
115. In the unlikely event of a 'missed' tree roost being accidentally felled or disturbed, the ECoW will ensure that a Natural England bat licensed ecologist attends the site as soon as practicable. The bat licensed ecologist will ensure the section containing the roost is moved to a suitable safe and sheltered location, at least 15m from the works area and away from any potential obstructions that could prevent the exit of bats which may still be present. If required, the bat licensed ecologist will capture and relocate any disturbed bat(s) to a suitable alternative roost site, such as the pre-installed bat roost box. Alternately, if considered necessary, the bat(s) will be taken to a Natural England licensed handler who can monitor its recovery prior to release.
116. A record of findings and measures undertaken to protect any disturbed roosting bats will be maintained by the ECoW and provided to the NFOW Onshore Environmental Manager. The ECoW will inform Natural England of the event and measures undertaken as soon as practicable. If a Natural England licence is required to continue the works, the ECoW will complete and submit an application, and works will not recommence until the licence has been obtained. Works would then be carried out in accordance with the licence and as necessary, under the watching brief of a Natural England bat licensed ecologist.
117. In the event that additional trees or other features potentially suitable for roosting bats are identified that would be impacted by the works (e.g. if there was a previously unforeseen need to fell or manage a tree), the affected feature would be subject to appropriate surveys by a suitably experienced/licensed bat ecologist.
118. All lighting will only operate when required and will be directional to avoid unnecessary illumination. All necessary lighting shall be designed to minimise

light scatter (kept near or below the horizontal) and would be designed in accordance with the BCT and Institute of Lighting Professionals (ILP) guidance note on *Bats and Artificial Lighting at Night* (ILP and BCT, 2023). Any changes to lighting requirements would need to be discussed and approved in advance with the ECoW.

2.3.4.4 Badger

119. All measures in respect of badgers would be undertaken in accordance with the EMP and Natural England Licence (if relevant). The need for a licence has not yet been determined by Natural England.
120. Where practicable, works-free buffer zones will be demarcated on site around areas of badger activity to ensure these are kept fully intact and with minimal interference from construction.
121. Night working will be avoided unless essential (OCoCP (Document Reference: 7.13)). Where night working may be required, lighting will be focused on works areas and directed away from badger setts and areas of high potential value to foraging badgers (e.g. areas of rough grassland and woodland). Lighting will be kept to a minimum, where it is located within 30m of an active badger sett.
122. The ECoW would undertake regular site inspections to confirm compliance with these measures. In the event that additional setts (or potential setts) are identified, either by the ECoW or site staff, all works within 30m of the potential sett would cease, until the ECoW had inspected the potential sett.
123. A report of findings of the site visit and implications for construction will be produced by the ECoW and provided to the NFOW Onshore Environmental Manager.
124. Any works likely to damage or disturb the newly identified sett would be subject to a Natural England development licence; no works would be undertaken within the 30m impact zone (or as otherwise advised by the ECoW), until the licence was in place and all required measures (e.g. sett closure) implemented.
125. Excavations left open overnight would be left with a battered (sloped) edge or exit ramp no steeper than 40° so that any animals which fall in can climb out rather than become trapped. All excavations would be visually checked by contractors to ensure no animals are present before the excavation is backfilled.
126. Night lighting of the construction site would be minimised or avoided entirely where practicable, particularly during the period from March to October inclusive. This is to seek to minimise disturbance to badgers and numerous other nocturnal and crepuscular species.
127. If construction works result in the death or injury of a badger, the appropriately experienced pre-approved ecologist will determine the cause of death where possible (through speaking to site workers, inspecting the body if possible, and investigating site conditions). If the death is considered likely to be a result of construction works the need for further mitigation measures such as the installation of badger exclusion fencing around working areas or the use of additional covering of excavations to prevent access into dangerous areas, will be assessed and determined. Findings of the assessment and measures proposed will be reported to the NFOW Onshore Environmental Manager as soon as practicable.

2.3.4.5 Otter and water vole

128. If water voles / otter are encountered during the works, then works within 15m (water vole) / 100m (otters) of the relevant watercourse would cease, and the ECoW or suitably qualified ecologist contacted.
129. The ECoW would assess the need for further mitigation measures including the requirement for a Natural England licence, as set out in Section 2.2.3.4, prior to works re-commencing. Construction works would be carried out in accordance with the requirements of the licence and under the guidance of the suitably qualified ecologist and, where necessary, an ecological watching brief.
130. Vegetation on the riverbanks should be retained, as these areas often act as shelter and ideal holt areas for otters. The following standard mitigation should be followed during construction:
 - Any pipes over 15 cm in diameter should be capped or sealed at the end of every working day to prevent otter from accessing;
 - Any holes or trenches which are left open overnight should be covered or have an exit ramp installed. The ramp may comprise a formed slope or wooden plank capable of supporting an otter at no steeper than 45 degrees. All areas should be checked at the beginning of the shift to ensure exit ramps are still intact and no otter have entered during the night;
 - During construction, all chemicals and materials to be used on site should be safely and correctly stored and labelled, ideally within a bunded area and spill kits shall be made available on-site in case spills do occur;
 - An emergency procedure should be implemented by site workers if otters are unexpectedly encountered. All work within 30m will cease until advice has been provided by a suitably qualified ecologist; and
 - Works within 100m of a river shall not take place at night or within one hour of sunset and sunrise, where practicable.
131. Additionally, all equipment used during construction that could potentially harm otters should be cordoned off at the end of each construction day by temporary fencing, to ensure otters are not injured if investigating the onshore project area.
132. Mitigation for temporary habitat loss and disturbance for water voles may include:
 - Micro-siting to avoid water vole burrows (if present).
 - Scheduling of work to avoid sensitive periods of the water vole life cycle.
 - Removing vegetation back to bare earth in spring and autumn.
 - Carrying out a destructive search of water vole burrows, after an appropriate monitoring period, after removing vegetation.
 - Creation of temporary compensation/ mitigation habitats for use by water vole in immediately adjacent areas (such as provision of nest boxes or feeding stations, sympathetic management of bankside habitats) for the construction plus vegetation re-establishment period.

- Reinstatement of bankside habitats immediately after work, to include sowing with species-rich locally appropriate sward and fencing to prevent stock access.

133. If working at night is undertaken within or adjacent to watercourses, any lighting will be focused on working areas and directed away from the watercourse and other watercourses of potential value to otters. Lighting will be kept to a minimum, up to approximately 100m from otter holts or other identified resting places.

2.3.4.6 Reptiles

134. As stated in Section 2.3.4, a PMoW will be put in place for all suitable reptile habitat within the onshore project area and this will be detailed and agreed through the Project's final EMP.

135. In the event that reptiles are encountered during construction, the ECoW would be contacted, who would move the reptile to suitable retained habitat if possible and advise on additional measures that would be required to ensure killing/injury to reptiles was avoided.

2.3.4.7 Hazel Dormice

136. In order to mitigate the effects of habitat fragmentation, temporary hedgerows would be put in place across the gap during the active season (April to October inclusive). These temporary hedgerows would be taken down during the day to allow vehicles to use the haul road and put back in place overnight when the dormice are active. The final proposed method will be detailed within the EMP.

2.3.4.8 Great crested newts

137. All ponds with confirmed great crested newt presence will be avoided during construction and cable routing.

138. As mentioned in Section 2.3.4.1, all works would be undertaken in accordance with the Natural England great crested newt DLL.

139. If a great crested newt is located during construction, works in the area would cease immediately and the ECoW would be informed. To maintain the welfare of the great crested newt, a Natural England great crested newt licensed ecologist would attend the site to handle and where necessary, relocate any great crested newt to outside the working area and provide further ecological advice as to the way forward.

2.3.4.9 Invasive non-native species

140. The main risks of INNS are associated with the transfer of INNS between watercourses or waterbodies. However, the majority of watercourse crossings are being undertaken using a trenchless crossing technique e.g. HDD but there remains a risk of INNS transfer where works are undertaken in or near water.

141. Construction activities would be monitored by on-site workers to identify potential invasive species, as informed by toolbox talks. Should INNS be located within the works area, the following measures would be applied:

- To avoid disturbance and spread of INNS, where practical an exclusion zone would be created around INNS of at least 7m;

- Signage would be erected to indicate the location of soils, materials or water contaminated with INNS;
 - Vegetation clearance within areas of INNS would be undertaken by an appropriately qualified contractor, under the watch of the ECoW; and
 - Topsoil containing INNS would be managed separately and contained within restricted areas to avoid the spreading INNS to unaffected areas.
142. Construction practices would be implemented in accordance with an INNS Management Plan, provided with the EMP.
143. Measures would be set in place to minimise the potential for pollution from silt deposition into watercourses and from works vehicles, including measures to prevent transfer of invasive plant or animal species between watercourses.
144. All construction vehicles and machinery entering and leaving the onshore project area would follow the biosecurity measures of the GB Non-native Species Secretariat (NNSS) “check, clean, dry” guidance. In addition, the following biosecurity protocols would be adopted in all areas known to support INNS as a minimum:
- All vehicles arriving on site would be checked to ensure that they are clean and free from any INNS prior to entering the onshore project area.
 - If soil or other material is imported to the onshore project area, documentation from suppliers would be obtained to ensure it is free from INNS.
 - All footwear of construction workers would be inspected visually to ensure they are clean from soil and debris before entering and leaving the onshore project area.
 - All vehicles would be kept clean, in particular removing any accumulated mud/material before entering and leaving the onshore project area.
 - All facilities within onshore project area would be equipped with disinfectant to clean footwear/equipment/vehicles prior to entering and leaving the onshore project area.
 - All removed material and/or disinfectant used to clean footwear/equipment/vehicles would be appropriately disposed of.
 - All access to onshore project area would be kept to a minimum and all vehicles and personnel would keep to maintained tracks, with vehicles parked within designated areas and/or hard standing.
 - Wherever possible, personnel and vehicles would avoid areas known to contain INNS.
145. The ECoW would undertake regular inspections of the work area to confirm the presence of INNS and adherence to required measures.
146. In the event that additional areas of INNS are identified the ECoW would review and update the INNS Management Plan to include these additional areas/INNS and their appropriate measures.

2.4 Post-construction mitigation measures

147. This section describes the mitigation measures that will be undertaken as soon as practicable following the completion of the works. These measures will be to mitigate the impacts of development on features of ecological and nature conservation interest and to provide biodiversity benefit.
148. Measures related to habitats are set out in Section 2.5.1.

2.4.1 Protected and notable species

149. Where a Natural England licence for protected species has been obtained or identified to be required for construction works to be undertaken, the licence applications may include habitat restoration and enhancement measures for the benefit of the protected species that the licence applies to. These would be carried out by landscape contractors working under the guidance of a suitably qualified ecologist and/or licence holder.
150. The suitably qualified ecologist and/or Natural England licence holder would be responsible for producing any required Natural England licence return forms and report of the works undertaken. A copy of the forms and reports would be provided to Natural England and the relevant LPA as soon as reasonably practicable and as prescribed under the conditions of the Natural England licence.
151. As set out in Section 2.3.4.2, soft landscaping works committed to within the onshore substation works area will be designed to be sympathetic for the year-round habitat requirements of grey partridge and nesting skylark. Section 2.3.4.2 also highlights that effort would be made in consultation with the Essex Wildlife Trust, Tendring District Council and Natural England, to repair or replace existing nest boxes for barn owls within Holland Haven Marshes SSSI or add new ones in suitable locations across the onshore project area.

2.5 Long-term ecological management

152. This section describes ecology measures to be undertaken following the completion of post-construction mitigation described above.

2.5.1 Habitats

153. Reinstated habitats will be subject to an aftercare period of up to 10 years following reinstatement, to be extended (if required) if reinstatement is not deemed to have been successful. The methods of aftercare will be agreed in the Written Landscaping Scheme and subject to the results of monitoring but are likely to include the management of undesirable weeds. During the aftercare period certain areas (such as adjacent to public rights of way (PRoW)) are likely to need protection from disturbance by people, dogs and grazing animals. The precise methods for protection will be agreed as part of the EMP, but is likely to involve the use of temporary fencing and signage. This aftercare period applies to all habitats created and reinstated.

154. During the establishment phase, failed plants will be replaced like-for-like as required to prevent any significant gaps in planting and as agreed with landowners for up to 10 years post-construction.
155. Should Natural England development licences be required for works to be undertaken, long term habitat management would be carried out in accordance with the requirements of these licences.
156. All topsoil stripped in grassland areas would be stored separately and reinstated following the completion of construction. Topsoil storage would be subject to a Soil Management Plan as part of the Project's Code of Construction Practice (CoCP) (secured through a DCO Requirement), which would also detail measures for soil storage and handling. Grassland reseedling would be undertaken using a local seed mix, to be agreed in advance with Natural England and Essex Wildlife Trust.
157. Where practicable, harvesting a green hay crop from the grassland areas being lost will be carried out, for use as seed on the reinstatement and compensation areas. Where practicable the salvage of turves from grasslands areas being lost will be carried out for re-use on the reinstatement and compensation areas.
158. Compensation for loss of hedgerows will be provided by re-instating native, species-rich hedgerows with trees, and including ditches where these were also present originally. Hedges will be reinstated at their original location and comprise a locally appropriate mixture of locally important and native species, as advised by Essex Wildlife Trust. Pre-planting will be carried out where possible so hedgerows and trees can establish as close as possible to the time of initial habitat loss.
159. Hedgerow replanting will follow in the first winter after construction, with the exception of the 6m gap required for the haul road, which will be replanted following the completion of onshore construction (i.e., after at most 18 months). Replanting will follow guidance to encourage insect biomass (Collins, 2023).
160. Future hedgerow management along the onshore cable route will include allowing standard trees (with the exception of a 6m buffer from each cable centre) to develop during the period of aftercare (up to 10 years) to improve quality of the hedgerow as a foraging resource.
161. All retained hedgerows within the onshore project area should, where practicable, be allowed to thicken up during construction and operation to facilitate use as feeding and commuting corridors for wildlife.
162. In the longer term, woodland within the onshore substation works area will require regular maintenance to ensure that trees do not interfere with the operation and maintenance of the project.
163. Future enhancement would include thinning woodland and starting a coppicing process. Under a coppicing regime, cuts will be made on a cyclical rotation to ensure that the screening benefits are not compromised.
164. The final Written Landscaping Scheme will include details of planting methodologies and plant species lists.
165. Efforts will be made to reinstate arable field margins, in consultation with Essex Wildlife Trust and the local landowners, to ensure the optimum benefits can be

gained from each margin affected. Attempts will be made to ensure habitat reinstatement takes the form of one of the following (Joint Nature Conservation Committee (JNCC), 2008):

- Cultivated, low-input margins (land managed specifically to create habitat for annual arable plants);
- Margins sown to provide seed for wild birds (margins or blocks sown with plants that are allowed to set seed and which remain in place over the winter);
- Margins sown with wildflowers or agricultural legumes and managed to allow flowering to provide pollen and nectar resources for invertebrates;
- Margins providing permanent, grass strips with mixtures of tussocky and fine-leaved grasses.

2.5.2 Protected Species

166. Where a Natural England licence for protected species has been obtained or identified to be required for works to be undertaken, the licence holders would be responsible for maintaining a record of all ecology works completed, which would be provided to Natural England and the relevant LPA as soon as practicable and as prescribed under the conditions of any Natural England licence. Should any Natural England licences for protected species be required, the licence holders (e.g. ECoW) will notify the NFOW Onshore Environmental Manager of any additional survey and habitat requirements.

2.6 Biodiversity enhancements

167. Details of the BNG commitments are presented in the BNG Strategy (Document Reference: 7.22).
168. North Falls are exploring opportunities to deliver a minimum of 10% BNG for the onshore elements of the Project. The Project is engaging with Natural England and other ecological stakeholders and members of the Onshore Ecology Expert Topic Group (ETG) to identify suitable projects and plans for delivering this BNG. Further details regarding the location of the Project's BNG are set out within the BNG Strategy (Document Reference: 7.22).
169. As part of North Falls BNG targets, habitat creation will be required to off-set losses in biodiversity value within the onshore project area. Habitat creation will be detailed in the EMP and post-consent BNG Assessment Report, secured by DCO Requirements.
170. All habitats created as part of ecological compensation or enhancement within the onshore substation works area will be subject to longer term monitoring and management, as these areas are included in the Early Design BNG calculations as post-development habitat creation. Habitats included within the Project's BNG calculations must be subject to a 30 year maintenance period, to ensure habitats are maintained at the target condition during this period. This includes the 10 year aftercare period. A detailed post-construction monitoring and management plan will be prepared, the full details will be included in the Written Landscaping Scheme.

171. In the event that additional measures are required for protected species, these shall be monitored against defined aims and objectives which shall be included in the Written Landscaping Scheme.
172. Local and national biodiversity strategies will be considered in the biodiversity enhancements by:
- Ensuring woodland plantation as part of landscaping follows the Essex County Council guidance Essex Tree Palette: A guide to choosing the most appropriate tree species for Essex sites according to landscape character and soil type (2018);
 - Use of Sustainable Drainage Systems (SuDS) in line with the Essex Green Infrastructure (GI) Strategy (Essex County Council, 2020);
 - Strategic planting to ensure habitat connectivity is created with the surrounding landscape, in line with the Essex GI Strategy (Essex County Council, 2020);
 - Retention of trees and hedgerows where possible, in line with the Essex GI Strategy (Essex County Council, 2020); and
 - Planting of lowland meadow UK Habitat of Principle Importance (UKHPI) as listed in Section 41 of the Natural Environments and Rural Communities Act (as amended) 2006.
173. The following biodiversity enhancements will also be incorporated into the Written Landscaping Scheme in order to target locally important ecological receptors at the onshore substation:
- Reptile and amphibian hibernacula, placed to create transitional areas between areas of woodland and grassland;
 - Scrape creation within open grassland for butterfly and moth species dependent on colonising plant species. Such areas would also provide basking habitat for reptiles;
 - Sustainable Drainage System (SuDS) pond design will be tailored to ensure suitability for supporting breeding amphibians, in line with criteria set out in Oldham et al. (2000) and the Great Crested Newt Conservation Handbook (Langton, Beckett and Foster, 2001).

2.7 Monitoring and reporting

2.7.1 Reporting

2.7.1.1 Pre-construction

174. The ECoW will maintain a record of all pre-construction surveys which are undertaken. The ECoW will be responsible for the production of the pre-construction survey reports.
175. Survey reports, including advice regarding implications for construction, will be provided to the NFOW Onshore Environmental Manager and a copy will be made. Copies will also be appended to the EMP.

176. Should any Natural England development licences be required, the ECoW will be responsible for the production of the Natural England licence applications which will be submitted to Natural England. Reports will support Natural England licence applications where required. Copies of the application will be provided to NFOW.

2.7.1.2 During construction

177. The ECoW will maintain a record of all ecological work which is undertaken during the construction period, including any ecological watching briefs or protected species surveys and findings of any site visits. Reports will be provided to the NFOW Onshore Environmental Manager and where appropriate to Natural England.

178. The ECoW will maintain a record of any breaches of the requirements and any measures undertaken to mitigate potential impacts of a breach. Records will be provided to the NFOW Onshore Environmental Manager and if necessary, Natural England.

179. If any reasonable changes to the measures are considered necessary by the ECoW to achieve the objectives and adhere to the requirements of the EMP and any relevant legislation, the ECoW will produce a report of these proposed changes, detailing the reasons for them, and this report will be provided to the LPA (Essex County Council) for approval prior to the measures being carried out on site.

180. Should a Natural England licence be required during the construction period, the ECoW will be responsible for applying for a licence. The ECoW and/or Natural England licence holder will be responsible for producing any required Natural England licence return forms and report of the works undertaken.

181. A copy of the forms and reports will be provided to the NFOW Onshore Environmental Manager, Natural England and the LPA (Essex County Council) as soon as reasonably practicable and as required under the conditions prescribed by the Natural England licence.

2.7.1.3 Post-Construction

182. Should any Natural England development licences be required, the ECoW and/or Natural England licence holder will be responsible for producing and distributing any required Natural England licence return forms and report of the works undertaken.

183. The ECoW will be responsible for producing a report to confirm habitat reinstatement or enhancement requirements have been carried out in accordance with this plan and the Written Landscaping Scheme.

184. All post-construction monitoring surveys would be undertaken by appropriately experienced and where necessary, licensed ecologists.

185. All surveys would be undertaken in accordance with bio-security risk assessments and approved risk assessments would be in place prior to the commencement of any survey.

2.7.2 Monitoring

186. The ECoW would be responsible for monitoring adherence requirements of the EMP during construction through:
 - Weekly site inspections; and/or
 - Weekly meetings with the Site Manager.
187. The ECoW would regularly monitor adherence to the requirements of the protective buffer zones, at least once every two weeks. Should any breach of these requirements become evident, the ECoW would inform the NFOW Onshore Environmental Manager. The ECoW would inform the Site Manager of measures required to rectify any potential impacts. The NFOW Onshore Environmental Manager would be responsible for notifying Natural England of any breaches to the buffer zones if necessary and as advised by the ECoW.
188. New planting would be monitored during the establishment phase by the NFOW Onshore Environmental Manager, landscape contractor, landowner or farm manager, as agreed between all parties. Failed plants would be replaced (subject to agreement with landowners) like for like as required to prevent the development of a significant gap in planting. Post-construction monitoring of protected species as required under any potential Natural England licences would be undertaken by the ECoW or appropriately experienced and if necessary, licensed ecologist(s), who would be pre-approved by the ECoW.
189. Hedgerows that are re-instated would be monitored once a year for the minimum of 10 year aftercare period post construction to ensure that the hedgerow has fully established. If it has not, then remediation works should be undertaken to ensure that it is achieved, including the replanting failed plants.
190. Populations of overwintering (October to February) and breeding birds (March to September) should be monitored throughout as it is possible there will be a change in population sizes over time. For example, overwintering bird roosts may increase in size, and new species may utilise the habitats within and surrounding the onshore project area.
191. An ECoW will need to check for the presence, spread from adjacent land or introduction of any INNS during pre-construction surveys. If they arise within the Onshore Development Area, appropriate course of actions according to the species in question must be taken in order to control spread and/ or avoid establishment.
192. If mitigation licences for any species reviewed within this document are obtained, then monitoring will be required as part of licence conditions. In most cases, the monitoring would be very focused, such as to the relevant trees (in the case of roosting bats where replacement bat roosting sites have been created) or the monitoring of newly constructed badger setts. Any monitoring requirements will be outlined within the relevant species' licences.
193. Should compensatory features be required for EPS as part of licence conditions, then ecological monitoring during, and post construction would be required in order to confirm the effectiveness of mitigation measures described above. As a minimum, ecological monitoring for the scheme would comprise:

- Monitoring of bat boxes installed during and post construction as part of the bat mitigation on site (if required), this will include checking their condition and clearing them out as well as for presence of roosting bats;
- Monitoring of bird boxes installed during and post construction as part of the bird mitigation on site, this will include checking their condition and clearing them out as well as monitoring their use by birds;
- Monitoring the establishment of any new shrubs, trees and other plants created as part of mitigation for habitat loss;
- Monitoring the populations of all species that require specific surveys and mitigation; and
- Ensuring eradication of any INNS species if identified in a works area, if they would need to be disturbed. If they are not in the works area then an appropriate cordon depending on species must be implemented.

2.7.2.1 Construction

194. The ECoW would maintain a record of all ecological work which is undertaken during the construction period, including any ecological watching briefs or protected species surveys and findings of any site visits.
195. The ECoW would maintain a record of any breaches of the EMP and any measures undertaken to mitigate potential impacts of a breach. Records would be provided to the Site Manager and the North Falls Environmental Manager, and if necessary the relevant LPA and Natural England. Should a Natural England licence be required during the construction period, the ECoW would be responsible for applying for the licence.

2.7.2.2 Post-construction

196. Post-construction monitoring of protected species as required under any potential Natural England licences would be undertaken by the ECoW or appropriately experienced and if necessary, licensed ecologist, who would be pre-approved by the ECoW.
197. The ECoW would be responsible for producing a report to the relevant LPA (Essex County Council) to confirm that all measures have been implemented in accordance with the EMP.
198. New planting would be monitored for up to 10 years during the aftercare period along the onshore cable route, and for the operational life for planting at the particularly around the onshore substation.
199. Should any Natural England development licences be required, the ECoW and/or Natural England licence holder would be responsible for producing and distributing any required Natural England licence return forms and report of the works undertaken.

2.8 Indicative timetable of suitable works period

200. Table 2.3 provides an indicative programme outlining the optimal and optional months during which the works detailed in this document could be undertaken. Table 2.2 sets out the key for interpretation of Table 2.3.

Table 2.2 Key for Table 2.3 showing an indicative programme for optimal works relating to Ecology

[Green box]	Ecology works period (optimal time)
[Yellow box]	Ecology works period (sub-optimal time)
[Grey box]	No ecology works

Table 2.3 Indicative programme for optimal works relating to onshore ecology

Work Description	Jan	Feb	March	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Pre-construction												
Breeding bird checks												
Pre-construction bat emergence/ re-entry surveys												
Pre-construction badger survey												
Pre-construction riparian mammal surveys												
Pre-construction hazel dormouse surveys												
Up-rooting of vegetation or clearance of materials of potential value to hibernating reptiles												
Habitat management to deter reptiles												
Applications for Natural England licences (should they be required)												
Construction												
Optimal period for clearance of hedgerows, scrub and trees												
Pre-clearance survey for nesting birds (should clearance not commence before nesting bird season)												
Clearance of hedgerows, scrub and trees, when pre-clearance surveys confirm no nests												
Post-construction												
Reinstatement and enhancement planting in accordance with the Written Landscape Scheme.												
Installation of bat boxes												
Long-term management												
Installation of bat boxes												

Work Description	Jan	Feb	March	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Replanting of failed plants during establishment period (10 years post planting).												

3. Landscape

3.1 Content of the Written Landscape Scheme

201. The Written Landscape Scheme, secured by DCO Requirement, will set out full details of the landscape mitigation measures which will be implemented as part of the Project. This will include:
- Details of trees, woodland and hedgerows to be protected and/or removed as part of the Project;
 - Details of earth bunding and finished ground levels; and
 - Full details of planting including planting schedules and method statements, as well as aftercare and maintenance requirements; and
 - A programme of works.

3.2 Landscape context

202. The landscape context of the onshore works is set out in ES Chapter 30 Landscape and Visual Impact Assessment (Document Reference: 3.1.32). The LVIA study area has been defined as a 500m radius around the onshore project area, combined with a 2km radius around the North Falls onshore substation.
203. The onshore substation works area is located to the north-east of an existing substation, and to the north of Ardleigh Road. It is located approximately 2km to the south-west of the settlement of Lawford, in Tendring. The onshore substation is proposed to be co-located with the Five Estuaries onshore substation.
204. The landform across the onshore substation works area is generally flat, and is approximately 35m Above Ordnance Datum (AOD). The landcover is characterised by arable farmland with a large-scale field pattern. Field boundaries are generally open in character. There are some hedgerow boundaries with occasional hedgerow trees. There is a higher level of tree cover along the boundary with Barn Lane and Grange Road, to the north and west, and also around the existing Lawford substation on Ardleigh Road. The onshore substation works area is open to farmland to the east and south. A steel-tower overhead electricity line crosses the north-western edge of the onshore substation works area.
205. The onshore substation works area is not located in any nationally designated landscapes (e.g. National Parks; National Landscapes) or locally designated landscapes (Areas of Special Character, as identified in the Tendring District Local Plan 2013-2033 and Beyond (Tendring District Council, 2021)).
206. The landfall will be located on the coastline between Frinton-on-Sea and Clacton-on-Sea (refer to ES Figure 30.1.1b, Document Reference: 3.2.26). The onshore export cables will link the landfall to the onshore substation, and will be buried underground. The onshore cable route is shown on ES Figure 30.1.1b (Document Reference: 3.2.26). From the landfall location, the onshore cable route travels north-west, through Tendring. It passes to the north of the small

settlement of Thorpe-le-Soken. The cable route then continues in a north-west direction, where it crosses the A120 near Horsley Cross and then continues in a more westerly direction on the approach to the onshore substation. There will also be a short section of 400kV onshore cable to link the proposed onshore substation to National Grid Electricity Transmission's (NGET) proposed East Anglia Connection Node (EACN) substation, North Falls' National Grid connection point (refer to ES Figure 30.1.5 (Document Reference 3.2.26) for location). The onshore cable route mainly passes through mixed farmland. Areas of woodland have been avoided during site selection as far as practicable, or where not practicable have been avoided through the use of trenchless techniques for cable duct installation.

207. Table 3.1 identifies the Landscape Character Areas (LCA) that the project components will be within, as defined in the Tendring District Landscape Character Assessment (LUC, 2001). LCAs are shown in ES Figure 30.1.3 (Document Reference: 3.2.26).

Table 3.1 North Falls Project Components and corresponding LCA

Landscape Character Area	Project components
7A Bromley Heaths – (Heathland Plateaux LCT)	The North Falls onshore substation works area will be within this LCA, as well as a section of the onshore cable route between Tendring Heath and the onshore substation. The Five Estuaries onshore substation will also be within this LCA.
2C Holland Haven (Drained Estuarine/ Coastal Marsh LCT)	The landfall and a section of the onshore cable route will be within this LCA.
3D Holland Coastal Slopes (Coastal Slopes LCT)	A short section of the onshore cable route will be within this LCA.
8B Clacton and the Sokens Clay Plateau (Clay Plateaux LCT)	A section of the onshore cable route will be within this LCA, between Great Holland and Thorpe-le-Soken.
6D Holland Valley System (Clay Valleys LCT)	Two short sections of the onshore cable route will be within this LCA, near Great Holland and near Tendring.
3A Hamford Coastal Slopes (Coastal Slopes LCT)	A section of the onshore cable route will be within this LCA, near Thorpe-le-Soken.
8A Tendring and Wix Clay Plateau	A section of the onshore cable route will be within this LCA, between Thorpe Green and Tendring Heath.

3.3 Design principles

208. A Design Vision document (Document Reference: 2.3) has been prepared to support the application, and this OLEMS should be read in conjunction with that document. The Design Vision provides detailed information on the application process; relevant policy, guidance and standards; design development and design principles to inform the site, landscape and architectural design of the co-located onshore substations; and details on consultation.
209. Following DCO approval, a Design Guide will be prepared that builds on the principles established in the Design Vision to inform the detailed design. The intention is for the Design Guide to be prepared joint with Five Estuaries, to support collaboration and good design across the two projects. The Design Guide will be subject to consultation with key stakeholders.

3.4 Construction stage landscape and visual mitigation

210. All areas subject to temporary disturbance during construction will be reinstated following the completion of construction. Table 30.3 of ES Chapter 30 LVIA (Document Reference: 3.1.32) provides details of proposed construction stage mitigation. This is summarised below.

3.4.1 Design mitigation

211. NFOW have committed to reduce the onshore cable route working width to 30m at hedgerow crossings where open cut trenching is proposed, to minimise the amount of hedgerow removal required. This will be achieved by not including the topsoil/subsoil storage bunds in the onshore cable route working width at hedgerow crossings.

3.4.2 Habitat management and reinstatement

212. The measures described in Section 2.5.1 in relation to habitat management and reinstatement will be implemented as part of the landscape and visual mitigation.

3.5 Operational stage landscape and visual mitigation

213. Mitigation of landscape and visual effects will be undertaken through design modifications and input to the design process. This includes consideration of the location of the various components within the onshore substation works area, and consideration of the materials used, colour palette and boundary treatments.

214. The following provides a summary of operational stage embedded and additional mitigation, as identified in ES Chapter 30 LVIA (Document Reference: 3.1.32). Further detail is provided in the Design Vision document (Document Reference: 2.3).

3.5.1 Design mitigation

215. The onshore substation will be designed to reduce the overall height and massing of associated structures and other elements as far as possible. Landscape proposals will include measures for the enhancement of local biodiversity during the operational phase of the onshore substation. This will include landscape screening of the onshore substation through hedgerow and woodland planting. Once matured, this will help to integrate the onshore substation into the existing landscape of arable fields and boundary trees/hedgerows.

3.5.2 Embedded mitigation

- Mitigation of landscape and visual effects undertaken through design modifications and input to the design process.

- The Design Vision also considers the location of the various components within the onshore substation works area, consideration of the materials used, colour palettes and boundary treatments.
- An arboricultural survey will be undertaken post-DCO consent to identify the locations and condition of existing trees, in order to maximise retentions on site, where possible.

3.5.3 Additional landscape mitigation

- Enhance and strengthen the existing landscape character, with reference to the Tendring Landscape Character Assessment.
- Create new GI features and connections through the site to surrounding linear features, such as hedgerows, screening belts and woodland clusters. These will provide multiple benefits in terms of enhancing habitat connectivity and visual amenity to road corridors and PRow.
- Enhance the necessary infrastructure within the site, for example, ensuring that attenuation ponds (if required) can provide multiple benefits, not only in terms of sustainable drainage but as landscape features and ecological habitats.
- Enhance the ecological and landscape condition of land parcels which cannot be returned to meaningfully agricultural use.
- All hedgerow sections removed to facilitate construction will be replaced.
- Hedgerows and trees will be replanted using locally native species as advised by Essex Wildlife Trust.
- Grassland reseedling will be undertaken using a local seed mix.

3.6 Outline Landscape Strategy

216. The Outline Landscape Strategy is shown in ES Figure 30.1.6 (Document Reference: 3.2.26). It provides an illustrative vision for the onshore substation works area that indicates how the layers of design analysis could respond to a developed site layout. The layout is based on the 'realistic worst case scenario' for North Falls and the 'maximum design scenario' for Five Estuaries, as assessed within the EIA.
217. The Outline Landscape Strategy builds up over a series of layers that explore:
- the existing site context and broader setting;
 - ways in which to improve the baseline condition through enhancement;
 - compensation for features likely to be lost;
 - strengthening of green and blue infrastructure; and
 - mitigation for adverse landscape and visual effects.
218. Further detail on the species and specification of planting and seeding will be agreed with the LPA, post consent. Reference will be made to the Essex County Council Tree Palette and Forestry Research guide to climate resilient species.

Locally important and native species will be used, as advised by Essex Wildlife Trust.

219. The Essex County Council Tree Palette notes that within Glacial Till Plateau Landscapes, where the onshore substation will be located, the following species are present:
- Abundant species: field maple *Acer campestre*, hazel *Corylus avellana*;
 - Frequent species: hornbeam *Carpinus betulus*, hawthorn *Crataegus monogyna*, bird cherry *Prunus avium*, blackthorn *Prunus spinosa*, oak *Quercus robur*;
 - Occasional species: alder *Alnus glutinosa*, holly *Ilex aquifolium*, white willow *Salix alba*, crack willow *Salix fragilis*, yew *Taxus baccata*;
 - Rare: black poplar *Populus nigra betulifolia*, sessile oak *Quercus petraea*, wayfaring tree *Viburnum lantana*;
 - Native species not recommended for planting: silver birch *Betula pendula*, downy birch *Betula pubescens*, poplar *Populus tremula*, elder *Sambucus nigra*.

3.7 Relevant onshore archaeology and cultural heritage mitigation

220. Impact to the historic landscape character (including hedgerows and parish boundaries) will be minimised by returning field boundaries / areas / hedgerows to their pre-construction condition and character post-construction, as part of a sensitive programme of backfilling and reinstatement / landscaping. Certain hedgerows and field boundaries (e.g., parish boundaries) may require recording prior to the construction process and enhanced provisions made during backfilling and reinstatement.

3.8 Landscape strategy principles

221. The landscape strategy considers how to enhance both the immediate development site and its broader landscape setting, through an understanding of the baseline landscape character, ecology, visual amenity, and the values placed on it by the local community and other users.
222. The onshore substation works area comprises large arable fields with limited boundary vegetation, comprising a short stretch of species-poor hedgerow and scattered trees (oak *Quercus robur* and ash *Fraxinus excelsior*). Two of these trees have been identified as bat roosts. Ditches and standing water are occasionally associated with field boundaries.
223. Off-site hedgerows can be found to the west and north of the onshore substation works area. These comprise hawthorn *Crataegus monogyna*, blackthorn *Prunus spinosa*, ivy *Hedera helix*, bramble *Rubus fruticosus* and oak *Quercus robur*.
224. Beyond the site boundary, woodland copses can be found at the point where several field boundaries join, at acute field boundary junctions, in proximity to farmsteads and large residential properties, landscaped estates (Ardleigh Park,

Green Island Gardens) and the perimeters of industrial areas (Martells Industrial Estate, Lawford Substation).

225. Key species recorded within local woodland areas include oak *Quercus robur*, ash *Fraxinus excelsior*, elm *Ulmus glabra*, white poplar *Populus alba*, sweet chestnut *Castanea sativa*, hazel *Corylus avellana*, holly *Ilex aquifolium*, sycamore *Acer pseudoplatanus*, birch *Betula* spp., and pines *Pinus* spp.
226. The Outline Landscape Strategy seeks to strengthen the existing fragmented landscape character and to knit it back into its wider landscape context, whilst strengthening ecological value and habitat connectivity.
227. The Outline Landscape Strategy presents opportunities to improve the existing landscape condition through hedgerow and tree planting and connecting these to small woodland copses that will provide intermittent visual screening and potential habitat for bats and dormice.
228. Restoration of grassland areas and treatment of field margins reflects the proposed ecological mitigation.
229. The inclusion of attenuation ponds as part of the permanent SuDS strategy presents an opportunity to develop a new wildlife habitat and amenity feature, which could provide an alternative visual focus at the heart of the site. Inclusion of seating and other wildlife viewing opportunities could be considered.

3.9 Planting information

3.9.1 Advance Planting

230. Where practical, landscape mitigation planting will be established as early as practicable in the construction phase. Opportunities for early landscape planting will be subject to the extent and timings of construction works, and will be explored and agreed through consultation with Five Estuaries, NGET and Essex County Council, before commencement of construction.

3.9.2 Planting Growth Rates

231. Mitigation planting will be of mixed natives in largely unexposed conditions. An average annual growth of 30 cm/year in the first 5 years can normally be assumed. Once established, growth rate will increase, and circa 50 cm/year for the next 10 years can be anticipated. If planted as transplants, this gives a height of 2-2.5 m in the fifth year and 7-7.5 m after 15 years. For more exposed locations it is recommended that annual growth is calculated by taking clues from the existing trees and hedges in the locality.

3.9.3 Planting Restrictions

232. There is a restriction on canopy trees (trees >5m in height) over a 6m width from each cable centre. Sub-canopy (i.e. hedgerow) trees and other planting will be acceptable above the cables.
233. There is a restriction on tree planting within a 30m easement to overhead lines (15m either side).

234. Planting around SuDS ponds will be confirmed once the drainage plan (secured by DCO Requirement) has been developed.

3.10 Landscape maintenance

3.10.1 Aftercare period

235. The success of planting will be monitored over an initial 10-year aftercare period after planting. During this period any plants which fail, die, are removed, or become seriously damaged or diseased, shall be replaced in the first available planting season with a specimen of the same species and size as that originally planted.
236. The purpose of the planting is to reinstate hedgerows and trees removed to facilitate construction works, and to provide landscape and visual mitigation along the extents of the onshore works, as well as to deliver BNG and benefit to the landscape of the area more generally. Maintenance activities will be undertaken in accordance with these purposes and will aim towards the establishment of dense, diverse hedgerows and naturalistic, species-rich woodland and grasslands.
237. During the 10-year aftercare period, activities will be carried out in accordance with a maintenance schedule that will be developed post-consent. This will set out requirements for monitoring visits, and where required watering, weed control, cutting/trimming, and replacement of failed plants. Progress in vegetation establishment will also be monitored to make sure that an appropriate mosaic of woodland, grassland and scrub habitats develop. Litter, refuse and debris will be removed from site after every site visit. At the end of the 10-year maintenance period, all stakes, ties and plant shelters will be removed from the planting area.
238. Maintenance activities will be undertaken in accordance with the following, subject to any updates:
- BS4428: 1989 Code of practice for general landscape operations (excluding hard landscapes); and
 - BS8545: 2014 Trees: from Nursery to independence in the landscape – Recommendations.

3.10.2 Longer term management

239. Habitats created as part of the landscaping within the onshore substation works area will be subject to a 30-year management and maintenance period, to ensure habitats created can contribute towards BNG targets. All other reinstated habitats will be subject to the 10-year aftercare period only, which will ensure the establishment of reinstated habitats is successful. The specific details of the 30-year management and monitoring period for created habitats will be detailed in the Project's final BNG Assessment Report, submitted post-consent and secured through DCO Requirement.

3.10.2.1 *Woodland*

240. In the longer term, woodland belts will require management and regular maintenance to ensure their effectiveness as screening, and to ensure that trees do not interfere with the operation and maintenance of the project.
241. Beyond the 10-year management period, regular inspections (at least annually) will be required for signs of diseased trees, dangerous limbs or rot requiring removal.
242. Future management could include selectively thinning woodland, ground flora management measures, and potentially starting a coppicing process. Under a coppicing regime, cuts would be made on a cyclical rotation to ensure that the screening benefits are not compromised.
243. As the woodland matures it is important to identify and develop a plan of succession. The age structure will be diversified to benefit the widest range of wildlife, the highest level of resilience, and long-term effectiveness of screening.
244. Before completion of the 10-year management period, a scheme regarding the measures to be implemented during the longer-term maintenance period will be developed and agreed with Essex County Council.

3.10.2.2 *Individual trees*

245. Existing trees will be monitored on an annual basis for signs of disease, dieback, dangerous limbs or any rot requiring removal. Veteran trees should be retained as features within the landscape wherever possible (where not affecting operational areas or within publicly accessible areas).

3.10.2.3 *Hedgerows*

246. Once established, hedgerows should be managed for wildlife and to maintain GI connectivity, both within the site and to enhance links to adjacent areas. Maintenance of buffer strips adjacent the hedgerow will facilitate habitat connectivity and provide nesting and overwintering areas.
247. Hedgerows should be cut on a 2-3 year rotation, thus allowing some sections to develop flowers and berries to support fauna. Cutting should be avoided within the bird nesting window and during winter months to maintain food sources for birds.


3.10.2.4 *Grassland*

248. Grassland areas within the onshore substation should be managed to facilitate operational integrity. Outside the onshore substation footprint, once-established, grassland areas should be managed for wildlife, in line with the objectives of the BNG Strategy (Document Reference: 7.23).

3.10.2.5 *Ponds and water bodies*

249. Ponds and water bodies should be maintained to provide a range of habitats for wildlife. This will primarily require selective clearance of shoreline vegetation to prevent overshadowing and clearance of pond plants to prevent over-dominance. Ponds should be monitored for the presence of invasive plants and algal blooms.

3.11 References

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