



Sheringham Shoal and Dudgeon Offshore Wind Farm Extension Projects

Outline Ecological Management Plan (Revision D) (Clean)

Revision D

Deadline 7

July 2023

Document Reference: 9.19

APFP Regulation: 5(2)(q)

Title:	
Sheringham Shoal and Dudgeon Offshore Wind Farm Extension Projects DCO Application Outline Ecological Management Plan (Revision D)	
PINS Document no.: 9.19	
Revision: D	
Document no.: C282-RH-Z-GA-00139	
Date:	Classification
July 2023	Final
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Approved by:	Date:
Sheery Atkins, Equinor	July 2023

Table of Contents

OUTLINE ECOLOGICAL MANAGEMENT PLAN	7
1 Introduction	7
1.1 Purpose of Document	7
1.2 Project Background.....	7
2 Pre-construction Mitigation Measures.....	11
2.1 General Pre-construction Measures	11
2.2 Habitats (including designated sites)	12
2.3 Protected and Notable Species	12
3 Construction Mitigation Measures	22
3.1 General Construction Measures	22
3.2 Habitats (including designated sites)	23
3.3 Protected and Notable Species	23
4 Post-construction Mitigation Measures.....	28
4.1 Habitats (including designated sites)	28
4.2 Protected and Notable Species	30
4.3 Long-term Ecological Management	30
5 Monitoring and Reporting	30
5.1 Monitoring	30
5.2 Construction.....	31
5.3 Post-construction	31
5.4 References.....	32
Appendix A – Pre-construction ecological surveys	33
1 Introduction	33

Table of Tables

Table 1: Colour coding system	33
Table 2: Proposed scope and timing of pre-construction onshore ecology and ornithology surveys	34

List of Appendices

Appendix A Pre-construction ecological surveys

Appendix 9.19.1 Species Legislation and Conservation Status

Appendix 9.19.2 Outline Biodiversity Net Gain Strategy

Glossary of Acronyms

BBPP	Breeding Bird Protection Plan
BCT	Bat Conservation Trust
BS	British Standard
BSI	British Standards Institution
CEMP	Construction Environmental Management Plan
CIEEM	Chartered Institute of Ecology and Environmental Management
CoCP	Code of Construction Practice
DCO	Development Consent Order
DEP	Dudgeon Offshore Wind Farm Extension Project
DLL	District Level License
DOW	Dudgeon Offshore Wind Farm
EA	Environment Agency
EC	European Commission
ECoW	Ecological Clerk of Works
EIA	Environmental Impact Assessment
EMP	Environmental Management Plan
EPP	Evidence Plan Process
ES	Environmental Statement
EU	European Union
GB	Great Britain
GCN	Great Crested Newt
HDD	Horizontal directional drilling
HRA	Habitats Regulation Assessment
HVAC	High Voltage Alternating Current
INNS	Invasive Non-Native Species
LMP	Landscape Management Plan
LPA	Local Planning Authority
MW	Megawatt
NBIS	Norfolk Biodiversity Information Service
NVC	National Vegetation Classification
Outline EMP	Outline Ecological Management Plan
PEIR	Preliminary Environmental Impact Report

RAMS	Risk Assessments and Method Statements
SAC	Special Area of Conservation
SEP	Sheringham Shoal Offshore Wind Farm Extension Project
SOW	Sheringham Offshore Wind Farm
SSSI	Site of Special Scientific Interest
SPA	Special Protection Area
TPP	Tree Protection Plan
TPZ	Tree Protection Zone
UK	United Kingdom

Glossary of Terms

Order Limits	The area subject to the application for development consent, including all permanent and temporary works for SEP and DEP.
Dudgeon Offshore Wind Farm Extension Project (DEP)	The Dudgeon Offshore Wind Farm Extension onshore and offshore sites including all onshore and offshore infrastructure.
DEP onshore site	The Dudgeon Offshore Wind Farm Extension onshore area consisting of the DEP onshore substation site, onshore cable corridor, construction compounds, temporary working areas and onshore landfall area.
European site	Sites designated for nature conservation under the Habitats Directive and Birds Directive. This includes candidate Special Areas of Conservation, Sites of Community Importance, Special Areas of Conservation and Special Protection Areas, and is defined in regulation 8 of the Conservation of Habitats and Species Regulations 2017.
Evidence Plan Process (EPP)	A voluntary consultation process with specialist stakeholders to agree the approach, and information to support, the EIA and HRA for certain topics.
Expert Topic Group (ETG)	A forum for targeted engagement with regulators and interested stakeholders through the EPP.
Horizontal directional drilling (HDD) zones	The areas within the onshore cable route which would house HDD entry or exit points.
Jointing bays	Underground structures constructed at regular intervals along the onshore cable route to join sections of cable and facilitate installation of the cables into the buried ducts.
Landfall	The point at the coastline at which the offshore export cables are brought onshore, connecting to the onshore cables at the transition joint bay above mean high water

OUTLINE ECOLOGICAL MANAGEMENT PLAN

1 Introduction

1.1 Purpose of Document

1. This document sets out the Outline Ecological Management Plan (EMP) for the proposed Sheringham Shoal Offshore Wind Farm Extension Project (SEP) and Dudgeon Offshore Wind Farm Extension Project (DEP) in respect of terrestrial (onshore) ecology and ornithology. The Outline EMP sets out an outline of the actions that are proposed to avoid or mitigate ecological impacts during the pre-construction, construction and operation phases of SEP and DEP. This Outline EMP will form the basis for a final Environmental Management Plan (EMP), which will be prepared and submitted prior to the commencement of onshore construction activities associated with the projects.
2. Following the submission of the Development Consent Order application, comments have been provided from stakeholders and interested parties in regard to the content. This revision of the Outline Ecological Management Plan (Revision D) therefore includes the following amendments:
 - **Table 2.1.19-1** (Indicative list of Pre-Construction Surveys) has been replaced with a table located within **Appendix A**. This provides added clarity and ease of reference following comments received from stakeholders;
 - Recognition of the need for consultation with the National Trust in their position as a conservation organisation (**Section 2.2**);
 - Updates to mitigation measures for Breeding Birds (**Section 2.3.2 and 3.3.2**);
 - Updates to mitigation measures for Bats (**Section 2.3.3 and 3.3.3**);
 - Updates to mitigation measures for Reptiles (**Section 2.3.6**);
 - Updates to mitigation measures for Great crested Newts (**Section 2.3.7 and 3.3.7**);
 - Updates to mitigation measures for pink-footed geese (**Section 2.6.1**);
 - Updates to mitigation measures for white-clawed crayfish (**Section 2.3.8**);
 - Updates to mitigation measures to protect against spreading of Invasive Non-native Species (**Section 2.3.8**);
 - Acknowledgement of the pending Natural England pink-footed geese guidance (**Section 3.3.1**); and
 - Updates to post-construction mitigation measures (**Section 4**).

1.2 Project Background

3. Equinor New Energy Limited (the Applicant) is seeking a Development Consent Order (DCO) for SEP and DEP which are extensions to the existing Sheringham Shoal Offshore Wind Farm (SOW) and Dudgeon Offshore Wind Farm (DOW), located in the southern North Sea off the north Norfolk Coast, with the closest point to the coast being 15.8km from SEP and 26.5km from DEP.

1.2.1 Key Relevant Components of SEP and DEP

4. Onshore export cables would travel approximately 60km inland from landfall, west of Weybourne, North Norfolk, to a high voltage alternating current (HVAC) onshore substation near to the existing Norwich Main substation. The onshore substation would be constructed to accommodate the connection of both SEP and DEP to the transmission grid.
5. The main onshore components of SEP and DEP include:
 - Landfall including transition joint bay;
 - Up to two ducts installed under the beach at the landfall by Horizontal Directional Drilling (HDD));
 - Onshore cable corridor, including:
 - Onshore export cables laid within open cut trenches or installed in ducts, and associated infrastructure including joint bays and link boxes;
 - Temporary construction access roads and haul roads;
 - Construction compounds; and
 - Trenchless crossings at sensitive features and habitats (e.g. A roads, main rivers and sites designated for nature conservation).
 - Onshore substation, including:
 - Substation operational access road; and
 - Associated earthworks, surface water attenuation and/or landscaping.
6. Further details of the key components of offshore and onshore infrastructure can be found in ES **Chapter 4 Project Description (Revision B)** [document reference 6.1.4].

1.2.2 Outline EMP Scope

7. The purpose of the Outline EMP is to provide a single document that presents the management and mitigation measures that will be undertaken prior to, during and post construction of the onshore elements of SEP and DEP for onshore ecology receptors. It also provides information on any long-term management measures required to enable the reinstatement and/or enhancement of habitats.
8. This Outline EMP provides details of pre-construction ecology surveys which will be required post consent in order to update the ecological baseline and inform the final management and mitigation plan.
9. It has been drafted based on the findings of pre-consent surveys undertaken during 2020 and 2021. Further information and full survey results can be found within the following documents:
 - **ES Appendix 20.1 Extended Phase 1 Habitat Survey Report (Revision B)** [REP3-040];
 - **ES Appendix 20.2 Great Crested Newt Survey Report (Revision B)** [REP3-042];

- **ES Appendix 20.3 Bat Activity Survey Report** [APP-216];
 - **ES Appendix 20.4 Wintering Bird Survey Report (Revision B)** [REP3-044];
 - **ES Appendix 20.5 Breeding Bird Survey Report (Revision B)** [REP3-046];
 - **ES Appendix 20.6 Initial Biodiversity Net Gain Assessment Report (Revision B)** [REP3-048];
 - **ES Appendix 20.7 Onshore Ecology Desk Study (Revision B)** [REP3-050];
 - **ES Appendix 20.8 Reptile Survey Report** [APP-221];
 - **ES Appendix 20.9 White Clawed Crayfish Survey Report (Revision B)** [REP3-052];
 - **ES Appendix 20.10 Bat Tree Roost Survey Report** [APP-223];
 - **ES Appendix 20.11 Invertebrate Survey Report** [APP-224];
 - **ES Appendix 20.12 National Vegetation Classification (NVC) Survey Report** [APP-225];
 - **ES Appendix 20.13 Riparian Mammals (Water Vole and Otter) Survey Report (Revision B)** [REP3-054];
 - **ES Appendix 20.14 Badger Survey Report (confidential)** [APP-227]; and
 - **ES Appendix 20.15 Arboricultural Survey Report** [APP-228].
10. At this stage it is not known whether SEP and DEP will be progressed concurrently or separately. For the purposes of this Outline EMP both projects are considered together, which is considered appropriate for this high-level document. Depending on the final timing of works, separate or combined EMPs would be produced.
11. Following the completion of the pre-construction surveys all relevant plans and ecological receptor locations will be updated and included within the final EMP (DCO requirement 15).
12. Specific details and locations of some ecological receptors (e.g. badger setts) are confidential and have been omitted from the public facing version of the Outline EMP. However, these have been provided to Natural England and the relevant planning authorities. This will also apply to the final EMP.
13. This Outline EMP should read in conjunction with the **Outline Code of Construction Practice (Revision F)** (CoCP) [document reference 9.17].

1.2.3 Structure

14. The Outline EMP is set out as follows:
- **Section 1.2.4 – General Responsibilities;**
 - **Section 2 – Pre-construction Mitigation Measures;**
 - **Section 3 – Construction Mitigation Measures;**
 - **Section 4 – Post-construction Mitigation Measures;**
 - **Section 4.3 – Long-term Ecological Management; and**
 - **Section 5 – Monitoring and Reporting.**

1.2.4 General Responsibilities

15. All of the ecological work set out in the final EMP will be undertaken under the guidance of the appointed SEP and DEP Ecological Clerk of Works (ECoW).
16. Site inductions and toolbox talks for all site personnel will include reference to the requirements of the EMP and CoCP.
17. The ECoW will undertake 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.
18. All site personnel will be briefed on the role and responsibility of the ECoW. Contact details for the ECoW will be provided within the EMP and will be made available to site personnel and contractors. A copy of the EMP will be kept on site at all times and site personnel will be made aware of its location along with the details of the person to contact in order to obtain a copy.
19. Any known breaches of the requirements documented within the EMP will be reported to the 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 confirming this breach to the responsible SEP and DEP Onshore Environment Manager and Site Manager. Where necessary, the responsible SEP and DEP Onshore Environmental Manager will report any breaches to the relevant authorities.
20. The ECoW will be responsible for developing an appropriate ecology incident response plan for any breach of the EMP, should an ecological incident occur. The responsible SEP and DEP Onshore Environmental Manager will ensure that any remedial measures proposed are communicated and where required, approved by the relevant Local Planning Authority (LPA) (North Norfolk District Council, Broadland District Council or South Norfolk Council). Where appropriate Natural England would be consulted to agree any remedial measures that may be required, as would the Environment Agency specifically in relation to Main Rivers.

21. The final EMP will be a live document and the ECoW will be responsible for reviewing and updating the EMP, ensuring that the Principal Contractor and all site personnel are aware of the latest version.

2 Pre-construction Mitigation Measures

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

2.1 General Pre-construction Measures

23. 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, and any additional survey locations or features 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). 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 Principal Contractor, prior to the commencement of a survey.
24. 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 Extended UK Habitat classification survey of the construction footprint (including appropriate buffer). All survey updates will be undertaken in accordance with relevant guidance (e.g. CIEEM, 2019; BS 42020:2013). **Appendix A** presents an indicative list of the pre-construction surveys that will be undertaken alongside each optimal survey period.
25. Desk Studies would be refreshed to obtain data on non-statutory designated sites and records of protected and valued species within 2km of the Order Limits from Norfolk Biodiversity Information Service (NBIS). In addition, although no new statutory sites (Sites of Special Scientific Interest (SSSIs), Special Protection Areas (SPAs), Special Areas of Conservation (SACs), National Nature Reserves (NNRs), Local Nature Reserves (LNRs) or Ramsar sites) are expected to be designated within the Order Limits or surrounding 2km area, Natural England's online MAGIC resource will be checked to confirm this.
26. Appendix A includes further details with regards to pre-construction ecological surveys noting that there is scope for these to be refined pending ongoing consultation with relevant stakeholders and design development.

2.2 Habitats (including designated sites)

27. The EMP will specify protective buffer zones around key retained habitats (e.g. woodland, mature broadleaved trees, ponds, important grasslands and sections of watercourses). These will be specified in the EMP and relevant construction drawings, with reference to other appropriate documents, including Tree Protection Plans (TPPs) which will be derived from the arboricultural survey and assessment undertaken post DCO consent; Construction Environmental Management Plan (CEMP) and standard industry guidance (e.g. BS5837:2012).
28. No works will be undertaken within these buffer zones, which will be maintained throughout the construction works period. Buffer zones surrounding retained areas of woodland and mature broadleaved trees will be at least 15 metres (m) in width or at least the width of the tree root protection zone (whichever is greater), as advised by an appropriately qualified arboriculturist. Where practicable, buffer zones around hedgerows being retained will be at least 5m in width. Additional buffer zones, where required, will be identified by the ECoW around habitat features of value to protected species.
29. All buffer zones will prohibit the tracking of heavy vehicles, and the storage of vehicles, machinery, equipment and soils. Buffer zones will 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 will be installed at appropriate locations. Where necessary, specific locations and any requirements will be discussed on site.
30. Full details of other mitigation measures will be set out in the EMP and relevant construction specifications and drawings, including:
 - Details of the location, timing and method for Horizontal Directional Drilling (HDD) to avoid impacts to valued receptors at the cable landfall and watercourse crossings (including Weybourne Cliffs Site of Special Scientific Interest (SSSI) and the River Wensum SSSI and Special Area of Conservation (SAC)).
 - Details of measures to manage pollution risk during construction will be set out in the CoCP.
31. The National Trust, as a conservation organisation with inalienable rights, would be consulted when developing the programme of ecology mitigation and enhancement insofar as the measures proposed would affect Weybourne Woods. This recognises the National Trust's position as a conservation organisation.

2.3 Protected and Notable Species

32. Pre-construction measures in respect of protected and notable species will be specified in the EMP. Key measures are set out below. Refer to [Appendix 9.19.1 Species Legislation and Conservation Status \[APP-305\]](#) for further information on species legal and conservation statuses.

2.3.1 Wintering Birds

33. Where construction works are planned to be undertaken on land which is potentially functionally linked to the North Norfolk Coast SPA/Ramsar site (i.e. sugar beet fields) between November and January inclusive, a Pink-footed Geese Mitigation Plan will be prepared and submitted to Natural England for approval prior to construction. Further detail is provided Section 2.6.1, below.

2.3.2 Breeding Birds

34. The key mitigation measures for breeding birds will comprise:
- Removal of vegetation such as hedgerows and scrub will be undertaken outside of the main bird nesting season which typically runs between March to August but is subject to weather and temperature. In locations where this measure cannot be accommodated, certain habitats (such as arable fields, hedgerows and small amounts of scrub) will be checked by an ecologist for the presence of active birds' nests. Where this pre-works check confirms the absence of active nests, clearance works can proceed shortly after, within no more than a few days of the check. If active birds' nests are found, these will be retained *in situ* and allowed to reach their natural conclusion without being disturbed or damaged. If active birds' nests are found, a suitable buffer will be put in place to protect the nest until the young have fledged. The buffer area will be based on species type and sensitivity (advice on this being provided by the ECoW or a suitably experienced ornithologist) but will 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).
 - One nesting bird species, crossbill (specially protected when breeding under the provisions of Schedule 1 of the Wildlife & Countryside Act), breeds much earlier than most other bird species with nests active from January until April. Crossbills occur in Weybourne Woods and the tree clearance here will be carried out in the autumn (September to November inclusive) to avoid both its breeding season and that of most other birds.
 - Areas of arable fields within the Order Limits that have the potential to support nesting skylarks will be managed prior to commencement of construction to deter nesting skylarks which may seek to use this habitat for nesting. Such management measures may involve the clearance of ground cover (i.e. arable cover) to create unfavourable nesting conditions. The EMP will include details of all measures that will be adopted to avoid nesting skylarks during construction. No works (i.e. site clearance) likely to impact areas where skylarks are present would be undertaken, until the required measures (i.e. habitat removal) have been undertaken, and measures such as habitat removal itself would take place outside the skylark nesting season.

- Measures will be adopted to minimise noise, light and disturbance on identified breeding birds, such as visual screening (e.g. opaque fencing) where necessary.
- Construction activities will be monitored by an ECoW or suitably qualified ornithologist, who would seek to ensure compliance with the Wildlife and Countryside Act 1981, i.e. 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 a suitably qualified ecologist. 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 will continue. Where it is determined that breeding birds may be affected, additional mitigation works will 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 will be suspended until chicks have fledged.

35. The ECoW will maintain a record of all pre-construction bird nest surveys undertaken. The record will be provided to SEP and DEP Onshore Environmental Manager and a copy will be made available to relevant stakeholders.

2.3.3 Bats

36. All trees within and up to a 50m buffer of SEP and DEP Order Limits will be re-appraised for their bat roost potential, and any that are found to have High or Moderate roosting potential (in accordance with Bat Conservation Trust classification guidelines) will be subject to a further pre-construction survey effort, undertaken within the appropriate survey window, to ascertain the presence or likely absence of transitional/hibernating/roosting bats. The pre-construction survey effort will also include any further surveys deemed appropriate, i.e. emergence/re-entry surveys, tree climbing surveys, inspections of potential roost features and/or a thermal imagery surveys of any features. All pre-construction bat surveys will be undertaken by a suitably experienced and/or licensed ecologist (as required by the type of survey).

37. A report of the pre-construction bat survey findings and recommendations will be produced by the suitably qualified and bat licenced ecologist and provided to the SEP and DEP Onshore Environmental Manager and Site Manager. The report will also be made available to relevant stakeholders.

38. Subject to the results of the pre-construction bat roost surveys, an application will be made for a Natural England Bat Mitigation Licence for any works likely to impact confirmed bat roosts (to include both roosts confirmed during pre-construction surveys and those confirmed during earlier surveys). No works would be undertaken affecting confirmed bat roosts until the licence and corresponding mitigation measures were in place. Works would be undertaken in accordance with the licence method statement, which would detail the timing and method for the removal of trees or other structures supporting bat roost(s), provision of replacement roost(s) (e.g. bat boxes), habitat creation/management, and any monitoring.
39. A Natural England licence return form and report of the works undertaken will then be completed by the suitably qualified and bat licenced ecologist (i.e. the bat licence holder). A copy of this form and report will be provided to Natural England and the local planning authority as soon as reasonably practicable, and as prescribed by the conditions of the Natural England development licence.
40. All trees with Low bat roost potential (as classified in accordance with Bat Conservation Trust guidelines) 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 EPS Mitigation Licences to fell any trees in which roosting bats have been confirmed 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.
41. The following pre-construction mitigation measures for commuting and/or foraging bats within the SEP and DEP Order Limits will also be implemented:
- Where possible, hedgerow removal will be undertaken during the winter, to allow time for bat species to adjust. Furthermore, the length and width of hedgerow requiring removal will be minimised wherever possible, such as by aligning hedgerow crossings with existing hedge gaps; and
 - Where existing habitats are located adjacent to construction works areas, these areas will be retained and protected from damage where possible, using fencing.

2.3.4 Badgers

42. Due to the mobile nature of badgers, prior to the commencement of works, a check of the Order Limits plus a 30m buffer zone, will be undertaken by qualified ecologists in order to confirm whether there have been any changes to the site conditions recorded during the pre-application surveys as well as noting any new badger setts that have been excavated.
43. A draft Natural England mitigation licence has been obtained; however, the findings from the pre-construction surveys will be used to identify if any changes to the draft mitigation licence is required. All pre-construction surveys will be undertaken sufficiently in advance of the commencement of works to ensure that should there be any changes required to the draft Natural England licence(s), that this is updated and resubmitted to Natural England prior to works commencing in the area(s) subject to the mitigation licence.
44. 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 construction corridor, warning signs will be installed and reduced speed limits for construction vehicles will be implemented to address increased risk of road traffic accidents with badgers.
45. Where an active badger sett is identified within 30m of the works a Natural England development licence for badgers would be obtained. Where badger setts are identified but works can be maintained at least 30m away (i.e. where a Natural England licence is either not required as works are located outwith the 30m buffer zone) or where the licence is being sought but yet to be received, the ECoW will ensure that a 30m buffer is set up around those active setts. No works will be undertaken within this 30m buffer unless advised to be acceptable by the ECoW. Once the licence has been obtained, the works will need to be carried out in accordance with the requirements of the licence and supervised by the ECoW.
46. 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.

2.3.5 Otter and Water Vole

47. Due to the mobility of otter and water voles and the period of time which will have lapsed between the pre-application surveys and the start of construction, a suite of pre-construction checks for otter and water voles will be undertaken between four to 12 months prior to the start of construction to determine the requirement for any Natural England licences. The first part of the pre-construction check will be that all watercourses within the DCO boundary will be re-appraised for the suitability of the habitat for otter and water vole as part of the updated Extended UK Habitat classification 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 more detailed field survey as part of the pre-construction surveys. No pre-construction surveys are proposed for watercourses which are to be crossed using HDD installation.

48. 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) will 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).
49. Based on the findings from the pre-application surveys, there is no specific licence requirements for otter or water voles. However, general mitigation measures that will be implemented during the works include:
 - Night-time working near watercourses will be avoided or minimised as far as possible; and
 - Exit ramps from excavations near watercourses will be provided at night, so to provide otter/water vole with an escape route and to avoid entrapment.
50. If water vole presence is confirmed during the pre-construction surveys the following measures would be considered. Based on that assumption, 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 proposed works. Displacement works is recommended to be carried out between 15th February and 15th April and where sufficient available alternative habitat exists. Regular repeat strimming will be undertaken to maintain the habitat's unsuitability for water voles. It is proposed that this mitigation will most likely discount the need for a Natural England licence.
51. It should be noted that the maximum working width, within the channel, when undertaking watercourse crossings will be no greater than 20m, which is an embedded mitigation designed into SEP and DEP. The exact location of each 20m wide crossing point, within the 45m wide (SEP or DEP in isolation) or 60m wide (SEP and DEP) corridor, will be defined as part of a micro-siting exercise in advance of construction. This compares favourably to current guidance which recommends that works to watercourses should be no greater than 50m in the first instance, (Dean et al. 2016).
52. Trapping and translocation of water voles, if required, should be completed between 15th February – 15th 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.
53. A licence application would be informed by any prior surveys and will contain a detailed method statement and mitigation plan. Licenced works will be carried out under a water vole watching brief, supervised by the suitably qualified ecologist who holds the water vole licence.
54. 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 relevant local planning authority as soon as reasonably practicable and as prescribed under the conditions of the Natural England licence.

2.3.6 Reptiles

55. Areas supporting reptiles will be managed prior to the commencement of construction to deter or displace any reptiles which might be present within the working areas. Habitat management will involve the phased clearance of ground cover to create unfavourable conditions. 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 will 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 will 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.
56. The EMP will include details of measures to avoid killing/injury of reptiles during construction. No works (i.e. site clearance) likely to impact areas where reptiles are present would be undertaken, until required measures (i.e. displacement or exclusion, or capture and translocation, under supervision of the ECoW) are in place.
57. All material that has been cut and/or removed, e.g. grass cuttings, tree branches, tree roots, will be left on site for 24-48 hours prior to removal. Material will not be stacked on site as this could provide a habitat feature of potential value reptiles (or other species). Instead, arisings will be removed from site or chipped and spread on site in agreement with the relevant landowner.
58. Habitat clearance during the active reptile season (i.e. between March and October, depending on local weather conditions) will commence either in the centre of the identified suitable habitat, progressively moving outwards, or from a side bordering suboptimal habitat, moving progressively towards more suitable habitat. This progression of clearance works through a site will enable any reptiles or other animals that may be present to leave the area and move to suitable habitat in the surrounding area. Scrub and tall grasses will be cut as above, to between 5cm and 10cm in height above ground level. All removed material will be removed from site, and any uprooting of vegetation or clearance of habitat of potential value to hibernating reptiles will be undertaken during the reptile active period.
59. Areas will be maintained in a condition not favoured by reptiles (i.e. with minimal ground cover) until the commencement of construction, through regular mowing of ground vegetation.
60. If habitat clearance for reptiles is to be undertaken during the breeding bird season, habitats of potential value to nesting birds will be surveyed as described above, allowing any active bird nests to be located.

61. At Hickling Lane (at the Onshore Substation Site) an additional procedure will be included in the reptile mitigation actions due to the presence of a population of slow worm. This reptile species is known to be less receptive to the habitat manipulation method described above (i.e. individuals are more likely to remain in-situ despite short-term habitat changes) compared to grass snake and common lizard. In addition to habitat manipulation, artificial refuges (as used for population monitoring) will be deployed in areas of suitable habitat which are within the proposed works footprint. When the artificial refuges are checked, any slow worms found will be caught by hand and moved to other adjacent and suitable habitat that borders Hickling Lane but at an appropriate distance from construction activities (but still inside the Order Limits). Such habitat is present and available for use within the same landholding as the substation. There would be no movement of slow worms to distant/separate site(s) and for that reason this is no more than a 'micro-scale' translocation to known suitable, adjacent habitat. In the unlikely event that the ongoing monitoring finds slow worms returning to the proposed works footprints, the installation of reptile proof fencing will become necessary to prevent slow worms from moving back into the works areas from the nearby areas to which they have been moved.
62. A record of works will be maintained by the ECoW and a copy of this record will be made available to the relevant planning authority (North Norfolk District Council or South Norfolk and Broadland District Council) and Natural England on request.

2.3.7 Great Crested Newt

63. Pre-application great crested newt surveys have been undertaken of ponds within and up to 250m of the SEP and DEP order limits. A District Level Licence (DLL) application has been submitted to Natural England for which the first stage payment is made, and certificate received. The requirement for and scope of any pre-construction GCN surveys will be determined in consultation with Natural England's DLL department; at present, guidance on further survey requirements or DLL does not clarify whether such surveys would be necessary for this particular project given its temporary construction impacts. In accordance with the DLL, there is no requirement for any mitigation measures to be implemented during construction activities to protect great crested newts.
64. 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 are:
- 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.
 - Excavations and working areas to be managed so as not to create temporary waterbodies which may attract newts.

65. The ECoW will be responsible for completing and submitting any information to Natural England in relation to the DLL, should it be required.

2.3.8 White-clawed crayfish

66. All watercourses within the DCO boundary will be re-appraised for their suitability for white-clawed crayfish as part of the updated Extended UK Habitat survey. Any watercourses which are found to provide suitable habitat for this protected species and which have not been previously surveyed (due to lack of survey access or because of a change in the suitability of the watercourse since the pre-application surveys), will be surveyed for white-clawed crayfish as part of the pre-construction surveys.
67. In the extremely unlikely scenario that a new watercourse is found which is suitable for white-clawed crayfish, where surveys then confirm the species is present, and where the watercourse would not be crossed using HDD, the following approach would be taken to address the presence of the species in the watercourse:
- A white-clawed crayfish licence will be applied for and obtained from Natural England to allow white-clawed crayfish to be moved. A licence will also be applied for and obtained from the Environment Agency to allow draw-down of the watercourse (assuming it is a Main River, as this is typically the type of watercourse which provides suitable habitat for the species) within an enclosed/dammed section.
 - Temporary dams will be installed at either end of the crossing section to create an 'enclosure' of river channel where open cut installation would take place.
 - Attempts will be made to catch any white-clawed crayfish within the enclosed section of the watercourse and move them to the section of river upstream of the dams, using techniques such as hand-catching, torching and artificial refuge trapping inside the 'enclosure' for a few days and nights before drawing down the water. The length of trapping would likely depend on capture rates; it would need to continue until 'depletion' had been reached (this would be determined by the licensed surveyor and would be specified within the licence).
 - Water from within the enclosure would then be slowly pumped out, with wire mesh over the pump intake to prevent small animals being drawn in.
 - As the water level within the enclosed area falls, any remaining white-clawed crayfish should become more obvious, as they will tend to emerge from beneath refuges or out of burrows on the river banks and in the river bed. Any newly found white-clawed crayfish would be caught and relocated upstream.
 - The exposed river bed would be checked by hand, removing/searching beneath any remaining stones, refuges and loose substrate. Any remaining white-clawed crayfish would be caught and moved upstream.
 - After construction is complete, the removed refuges (stones etc.) would be reinstated and the dams then removed. White-clawed crayfish should quickly recolonise the section of formerly enclosed river.

- In the event that any American signal crayfish are found during the above works, the animals will be humanely dispatched and the remains left on the river bank.

68. The Applicant is committed to using HDD methods to cross of the River Wensum SAC/SSSI, which has white-clawed crayfish as one of its qualifying features. Therefore, the above mitigation scenario would not need to be applied to this designated site.

2.3.9 Invasive Non-Native Species

69. Invasive non-native species (INNS) that are known, or are highly likely to occur, in selected parts of the construction works areas are Himalayan balsam and signal crayfish (potentially carrying crayfish plague). Since actions to address their presence (or potential presence) differ, they are addressed separately below.

70. Three separate stands of Himalayan balsam have been recorded within, or in proximity to the Order Limits. No other botanical INNS have been identified (ES [Appendix 20.1 Extended Phase 1 Habitat Survey \(Revision B\)](#) [document reference 6.3.20.1]). The recorded locations of Himalayan balsam are as follows:

- River Tud between Honingham and Easton (TG 1232 1152) within woodland bordering the River Tud, outside of the Order Limits.
- Unnamed stream, tributary of the River Wensum east of Swannington (TG 1411 1893), dense stand along the banks.
- River Bure, east of Saxthorpe (TG 1309 2987), stands on the banks of the river.

71. 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 HDD but there remains a risk of INNS transfer where works are undertaken in or near water.

72. The locations and extent of INNS, including Himalayan balsam will be informed by updated pre-construction surveys. Should INNS be located within the works area, the following measures will be applied:

- To avoid disturbance and spread of INNS, where practical an exclusion zone will be created around INNS of at least 7m;
- Signage will be erected to indicate the location of soils, materials or water contaminated with INNS;
- Should exclusion not be practical, good site practice measures for managing the spread of INNS during works at watercourses will be followed including:
 - Personnel working on or between sites should ensure their clothing and footwear and any machinery are cleaned where appropriate to prevent spread;
 - The use of tracked vehicles should be avoided within areas of INNS;
 - All vehicles leaving the infested area and/or transporting infested soil/materials onsite (if required) must be thoroughly cleaned in a designated wash-down area before being used for other purposes.

- Vegetation clearance within areas of INNS would be undertaken by an appropriately qualified contractor, under the watch of the ECoW.
- Topsoil containing INNS will be managed separately and contained within restricted areas to avoid the spreading INNS to unaffected areas.

73. The non-native signal crayfish has been recorded through eDNA laboratory analysis at five locations within, or in proximity to the Order Limits (ES **Appendix 20.9 White Clawed Crayfish Survey Report (Revision B)** [document reference 6.3.20.9]). The recorded locations of signal crayfish are as follows:

- River Bure At Saxthorpe Hall, east of Saxthorpe (TG 1308 2987).
- Unnamed tributary of River Wensum South of Church Lane, east of Swannington (TG 1410 1893).
- River Wensum South of the A1067 Fakenham Road at Attlebridge (TG 1288 1650).
- River Tud Unnamed plantation woodland north-west of Easton (TG 1245 1154).
- River Yare South-east of Colton Wood (TG 1186 0847).

74. The main risks presented by signal crayfish is its transfer from a watercourse or waterbody where it is present to a watercourse or waterbody where it is not present, and in that process lead to ecological damage in the new watercourse. This can include transferring crayfish plague to any populations of white-clawed crayfish in currently unaffected watercourses.

75. All the watercourse crossings where signal crayfish have been detected are being undertaken using HDD and hence the risk of transferring signal crayfish or spores of crayfish plague to other watercourses have been avoided.

76. As a result of this avoidance action, specific mitigation measures targeted at managing the risk of transferring signal crayfish or spores of crayfish plague to other watercourses is not required.

3 Construction Mitigation Measures

77. This section describes the ecological mitigation measures that will be undertaken during the construction phase of the development to ensure the protection of ecological receptors.

3.1 General Construction Measures

78. All construction will be undertaken in accordance with the EMP and CoCP. Measures that will be specified in the CoCP will include:

- All works will be carried out taking full account of legislative requirements and Environment Agency (EA) guidance;
- Heavy machinery will not be tracked over stored soils; and
- Vehicle speeds will be restricted within the working corridor to reduce the likelihood of injury to species on site.

79. Night working is not scheduled as part of the normal construction working hours and may only be undertaken to maintain programme progress and for specific time critical activities (e.g. for long HDD operations). Where night working is unavoidable, or lighting is required for security/health and safety reasons, light fixtures will 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 will be specified in the CoCP and inspected by the ECoW for compliance.

3.2 Habitats (including designated sites)

80. All protective buffer zones described under the Pre-Construction Mitigation Measures will be maintained throughout the construction phase. This will include the adherence and implementation of the protocols to manage the potential accidental release of lubricants, fuels and oils from construction machinery and HDD operations should there be a release/breakout of inert drilling fluids.
81. The ECoW will monitor adherence to the requirements of the buffer zones a minimum of once every two weeks and will maintain a record of all findings and site checks undertaken.
82. Should any breach of the requirements become evident, the ECoW will advise what remedial measures are required to be undertaken as soon as practicable to resolve the situation and minimise effects on ecology.
83. Any tree felling works and hedgerow clearance will be carried out in accordance with protected species requirements described in the sections below. The working width for each hedgerow crossed by open-cut trenching will be limited to 20m. Any soil storage areas will be located outside of tree protection zones (TPZs) as identified by the pre-construction arboricultural survey and at least 5m from retained hedgerows.

3.3 Protected and Notable Species

84. Construction measures in respect of protected and notable species will be implemented in accordance with the EMP.

3.3.1 Wintering Birds

85. Where works are undertaken between November and January and within areas of land which are potentially functionally linked to the North Norfolk Coast SPA/Ramsar site (i.e. sugar beet fields within 10.4km of the North Norfolk Coast SPA/Ramsar site), a pink-footed goose mitigation plan will be prepared and submitted to Natural England prior to its implementation and commencement of construction activities. The details of the plan will have regard to Natural England's emerging best practice advice on North Norfolk Coast SPA Pink Footed Geese.

86. The emerging Natural England best practice advice on North Norfolk Coast SPA Pink Footed Geese involves two route options for mitigating impacts to this species, both of which, at time of writing, are under development. However, as the pre-application surveys (which spanned two winters from 2019-2021) recorded no pink-footed geese within the Order Limits and therefore no impact on Pink Footed Geese, neither of the Natural England mitigation options is considered completely suitable for addressing the risks posed by SEP and DEP.
87. The approach likely to be proposed, could be a refined version of Natural England's emerging pink-footed goose mitigation guidance and site-specific evidence, involving the following:
- In the October prior to construction works commencing, all fields which are within the Order Limits and surrounding 200m buffer and also within 10.4km of the North Norfolk Coast SPA/Ramsar, would be inspected to identify and map fields which:
 - Have crop cover suitable for use by pink-footed geese;
 - Are over 6 hectares in size; and,
 - In which construction works are due to commence between November and January inclusive.
 - Any fields which comply with the above criteria would then be monitored by the ECoW at a rate of once per week between the following November and January.
 - Where the monitoring finds that pink-footed geese are present on a field, no construction works will take place within that field or the surrounding 200m until the geese have concluded their foraging activity, which will be confirmed by ongoing monitoring. Once foraging has concluded, construction works within that field and the surrounding 200m will be able to commence.
 - At other suitable fields where monitoring finds no evidence of pink-footed geese foraging, no construction works will commence until after January. This restriction will ensure that the resource of potential pink-footed goose foraging habitat is not pre-emptively depleted by construction works.
 - The presence of foraging pink-footed geese would be determined by visual observation of the birds themselves, plus inspections of the ground cover to check for foraged crops and bird droppings.
88. The above approach is an iteration of Natural England's best practice advice on North Norfolk Coast SPA Pink Footed Geese, that is considered to be appropriate to the particular wintering bird impact risks associated with SEP and DEP. The approach of avoiding any fields suitable for pink-footed geese unless and until the geese have exhausted that field's foraging resource is expected to be fully effective at ensuring no impacts to functionally linked land. Further detail and justification of the approach will be provided within the Pink-footed goose mitigation plan.

3.3.2 Breeding Birds

89. All works would be undertaken in accordance with the EMP. 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. If active birds' nests are found, these would be retained *in situ* until the ECoW confirms that breeding was completed and the nest was no longer in use. The ECoW would advise on retention of an appropriate exclusion zone around the nest until this time. That advice will be based on species type and sensitivity but will 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).

3.3.3 Bats

90. All works affecting confirmed bat roosts (to include both roosts confirmed during pre-construction surveys and those confirmed during earlier surveys) would be undertaken in accordance with the Natural England Bat Mitigation Licence and EMP. 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 survey/s by a suitably experienced/licensed bat ecologist. Any work within 10m (or as otherwise advised by the ECoW) of the feature would cease, until the presence of a roost was confirmed or discounted. Any works affecting a confirmed roost would be subject to a further Natural England Mitigation Licence; no work would be undertaken until the Licence was in place and implemented in accordance with the Method Statement.
91. In the case of each tree where the pre-construction surveys have categorised it as having Moderate or High potential for roosting bats but that follow-up surveys (e.g. emergence/re-entry surveys, tree climbing surveys etc.) have not confirmed a bat roost and that tree is required to be felled, then a soft-felling will be carried out as an additional precaution.
92. All lighting that is required during the construction phase will be designed in accordance with the BCT guidance. Any changes to lighting requirements would need to be discussed and approved in advance with the ECoW.

3.3.4 Badger

93. All measures in respect of badgers will be undertaken in accordance with the EMP and Natural England Development Licence. The ECoW will 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. Any works likely to damage or disturb the newly identified sett would be subject to a further 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.

94. Between the months of March and October inclusive, where possible all works will be restricted to daylight hours only. Between November and February inclusive, works extending up to one hour after sunset or beginning up to one hour before sunrise will be permissible because above-ground badger activity (and activity of most small terrestrial animals) at this time of year is reduced.
95. All works traffic operating outside of the public highway will be restricted to speed limits in accordance with the transport assessment. This measure will reduce the risk of road traffic accidents of badgers (and other animals) with construction traffic.
96. Excavations left open overnight will be left with a battered (sloped) edge no steeper than 40° so that any animals which fall in can climb out rather than become trapped. All excavations will be visually checked by contractors to ensure no animals are present, before the excavation is backfilled.
97. Night lighting of the construction site will be minimised or avoiding entirely, particularly during the period from March to October inclusive. This should minimise disturbance to badgers and numerous other nocturnal and crepuscular species.

3.3.5 Otter and Water Vole

98. If otter/water voles are encountered during the works, then works within 15m of the relevant watercourse will cease, and the ECoW or suitably qualified ecologist contacted. They will assess the need for further mitigation measures including the requirement for a Natural England Licence prior to works re-commencing. Construction works will 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.

3.3.6 Reptiles

99. Reptile mitigation will be implemented pre-construction in accordance with the EMP. 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.

3.3.7 Great Crested Newt

100. All works will be undertaken in accordance with the Natural England Great Crested Newt DLL.
101. The Applicant is committed to going beyond the requirements of the DLL during construction activities and will be applying a number of techniques to reduce the probability of impacting great crested newt, collectively termed 'Reasonable Avoidance Measures' (RAMs). These are:
 - 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.

- Excavations and working areas to be managed so as not to create temporary waterbodies which may attract newts.

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

3.3.8 Invasive Non-Native Species

103. Construction will be implemented in accordance with the INNS Management Plan. Measures will 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. All construction vehicles and machinery entering and leaving the working area(s) will follow the biosecurity measures of the GB NNSS “check, clean, dry” guidance. In addition, the following biosecurity protocols will be adopted in all areas known to support INNS as a minimum:

- All vehicles arriving on site will be checked to ensure that they are clean and free from any INNS prior to entering the working area(s).
- If soil or other material is imported to the working area(s), documentation from suppliers will be obtained to ensure it is free from INNS.
- All footwear of construction workers will be inspected visually to ensure they are clean from soil and debris before entering and leaving the working area(s).
- All vehicles will be kept clean, in particular removing any accumulated mud/material before entering and leaving the working area(s).
- All facilities within working area(s) will be equipped with disinfectant to clean footwear/equipment/vehicles prior to entering and leaving the working area(s).
- All removed material and/or disinfectant used to clean footwear/equipment/vehicles will be appropriately disposed of.
- All access to working area(s) will be kept to a minimum and all vehicles and personnel will keep to maintained tracks, with vehicles parked within designated areas and/or hard standing.
- Wherever possible, personnel and vehicles will avoid areas known to contain INNS.

104. The ECoW will undertake regular inspections of the work area to confirm the presence of INNS (including Himalayan balsam) and adherence to required measures. In the event that additional areas of INNS are identified the ECoW will review and update the INNS Management Plan to include these additional areas/INNS and their appropriate measures.

4 Post-construction Mitigation Measures

105. All post construction monitoring surveys will be undertaken by an appropriately experienced and where necessary, licenced ecologist(s). All surveys will be undertaken in accordance with bio-security risk assessments and approved risk assessments will be in place prior to the commencement of any survey.

4.1 Habitats (including designated sites)

106. The HDD compound located on the floodplain of the river Wensum (but outside the SSSI and SAC) will be restored in accordance with the River Wensum Restoration Strategy and the River Wensum SAC conservation objectives.

107. Following the completion of construction in an area, cleared, damaged or disturbed habitats will be reinstated in accordance with the agreed specifications. Woodland and scrub are key components of the proposed landscape proposals for the onshore substation. The aim of the management prescriptions is to guide the creation of a well-balanced, naturalistic landscape including woodland/woodland copses, scrub and tree belts, with a varied woodland edge and a dense canopy to provide screening at appropriate locations.

- Adjust stakes and ties at the end of each growing season or as necessary to maintain support and avoid chafing damage and thus minimise the possibility of infection taking hold within any wounds.
- Inspect and if necessary, repair deer, livestock and rabbit protection fencing regularly to ensure that it is effective in preventing browsing of plants by deer, livestock and rabbits.
- Maintain the ground around plants weed free for the first five years to minimise competition allowing plants to grow unimpeded.
- Replace all plants that die annually at the end of each growing season during the first ten years, or when it is agreed that the woodland or scrub has established effectively, and individual plant replacement is unnecessary. In addition to this, planting at the substation will be maintained for the lifetime of the projects (40 years).
- By year three woodland and scrub may need to be thinned. When choosing the specimens to be retained, it should be remembered that the primary functions of the woodland and scrub are to lessen landscape and visual impacts of the onshore substation and help to integrate it into its setting.
- Remove stakes and ties in year five, or when each plant is deemed firm and self-supporting.
- If used, plant shelters and guards should be removed once the trees/shrubs reach a level of maturity where they can withstand browsing wildlife and livestock.
- If the thinned specimens are intended to grow back as coppice the cut needs to be angled to ensure water will not pool on the cut.

- Brushwood and other vegetative arisings will be stacked within the woodland or scrub as small habitat piles, or disposed of offsite as instructed.
 - Deadwood is a particularly important woodland habitat and is of value to bats, birds, invertebrates and fungi. To ensure the woodland has the requisite deadwood habitat, dead and dying trees, where they do not present a significant safety risk, should be retained in a variety of situations. This may include creating eco-stick monoliths, a process of severe pollarding that removes all but the trunk of the tree to create standing deadwood.
 - Plants that pose a health and safety risk will be managed appropriately.
108. New and replacement hedges, and existing hedges with gaps bolstered with new planting, will be managed as described below. The objective is to increase the habitat potential and functioning of the hedges, some of which may contain mature hedgerow trees, whilst maintaining them as key features of the landscape, and to provide screening of proposed infrastructure.
- Adjust stakes and ties of hedgerow trees at the end of each growing season or as necessary to maintain support and avoid chafing damage and thus minimise the possibility of infection taking hold within any wounds.
 - Maintain the ground around each plant weed free for the first ten years to minimise competition allowing plants to grow unimpeded.
 - Replace all plants that die annually at the end of each growing season for the first 10 years
 - Remove stakes and ties in year five, or when the trees are deemed firm and self-supporting.
 - If used, plant shelters/guards should be removed once the trees/shrubs reach a level of maturity where they can withstand browsing wildlife.
 - Cut hedges annually between September and February to approximately 2m height, or the height of existing hedges as appropriate. The hedgerows should be managed to create a thick base with a good density of stems.
 - Plants that pose a health and safety risk will be managed appropriately.
109. All new planting will be carried out in accordance with the **Outline Landscape Management Plan (LMP) (Revision D)** [document reference 9.18]. The final LMP will include details of planting methodologies and plant species lists. The construction of buildings and planting of trees with deep roots will not be permitted above the permanent working area along the onshore cable corridor to prevent damage to onshore export cables.
110. The ECoW will be responsible for producing a report to confirm the habitat reinstatement have been carried out in accordance with the requirements of this Outline EMP and from an ecological perspective only.

4.2 Protected and Notable Species

111. 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 will be carried out by landscape contractors working under the guidance of a suitably qualified ecologist and/or licence holder.
112. The suitably qualified ecologist and/or Natural England licence holder will be responsible for producing any required Natural England licence return forms and report of the works undertaken. A copy of the forms and reports will be provided to Natural England and the relevant local planning authority as soon as reasonably practicable and as prescribed under the conditions of the Natural England licence.

4.3 Long-term Ecological Management

113. Long-term management of new and retained/enhanced habitats (e.g. new hedgerow and tree planting or wildflower grassland seeding) are presented in the **Outline LMP (Revision C)** [document reference 9.18] which will be approved by the relevant local planning authority prior to its implementation.
114. Details of the voluntary Biodiversity Net Gain commitments are presented in the **Appendix 9.19.2 Outline Biodiversity Net Gain Strategy** [APP-306].
115. Where a Natural England licence for protected species has been obtained or identified to be required for works to be undertaken, the licence holders will be responsible for maintaining a record of all ecology works completed, which will be provided to Natural England and the relevant local planning authority as soon as practicable and as prescribed under the conditions of any Natural England licence.

5 Monitoring and Reporting

5.1 Monitoring

116. The ECoW will be responsible for monitoring adherence requirements of the EMP during construction through:
- Weekly site inspections; and/or
 - Weekly meetings with the Site Manager.
117. The ECoW will 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 will inform the SEP and DEP Environmental Manager and Site Manager. The ECoW will inform the Site Manager of measures required to rectify any potential impacts. The Environment Manager will be responsible for notifying Natural England of any breaches to the buffer zones if necessary and as advised by the ECoW.

- 118. New planting will be monitored during the establishment phase by the Environmental Manager's landscape contractor, landowner or farm manager, as agreed between all parties. Failed plants will be replaced (subject to agreement with landowners) like for like as required to prevent the development of a significant gap in planting.
- 119. Post-construction monitoring of protected species as required under any potential Natural England licences will be undertaken by the ECoW or appropriately experienced and if necessary, licensed ecologist(s), who will be pre-approved by the ECoW.

5.2 Construction

- 120. 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.
- 121. The ECoW will maintain a record of any breaches of the EMP and any measures undertaken to mitigate potential impacts of a breach. Records will be provided to the Site Manager and the SEP and DEP Environmental Manager, and if necessary the relevant local planning authority and Natural England.
- 122. Should a Natural England licence be required during the construction period, the ECoW will be responsible for applying for the licence.

5.3 Post-construction

- 123. New planting will be monitored for up to ten years along the cable corridor, and for the operational life for planting at the substation (40 years). Failed plants will be replaced (subject to agreement with landowners).
- 124. 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.
- 125. The ECoW will be responsible for producing a report to the relevant local planning authority to confirm that all measures have been implemented in accordance with the EMP.

5.4 References

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Appendix A – Pre-construction ecological surveys

1 Introduction

1. This Appendix presents the Applicant’s proposed approach to pre-construction onshore ecological and ornithological surveys following comments received from Natural England [RR-063] and the Norfolk Wildlife Trust [RR-068] in their relevant representations. The purpose is to provide added clarity and ease of reference in relation to the Applicant’s current proposed approach to pre-construction ecological surveys, noting that there is scope for these to be refined pending ongoing consultation with relevant stakeholders and design development.
2. A summary of the Applicant’s approach to pre-construction ecological surveys is shown in **Table 2**. To aid the reader, a colour coding system has been used, as shown in **Table 1**.

Table 1: Colour coding system

Survey requirement	Cell colour
No further surveys are proposed	
Further surveys may be required	
Further surveys to be undertaken	

Table 2: Proposed scope and timing of pre-construction onshore ecology and ornithology surveys

Survey type	Proposed survey scope and timing	Justification
Desk Study: data search with the Norfolk Biodiversity Information Service (NBIS)	Recomplete a data search with NBIS approximately 12 months prior to commencement of construction, to obtain data on non-statutory designated sites and records of protected and valued species within 2km of the Order Limits.	The Applicant is aware that some County Wildlife Sites (CWS) within and around the Order Limits have been newly designated since the original data search was completed in April 2021. The updated data search would compile information on any such sites in order that they can be considered within the design of final micro-siting and mitigation measures. Records of protected and valued species would be used to inform the design of pre-construction surveys which would largely be completed within the year prior to commencement of construction, hence the need to complete the data search beforehand.
Desk Study: statutory designated sites search	Using the Multi-Agency Geographic Information for the Countryside (MAGIC) online resource. To be completed approximately 12 months prior to commencement of construction	An updated data search will be completed to revalidate the assessment on statutory designated sites within and around the Order Limits.
Extended UK Habitat ('UKHab') survey	To be completed in the 18 months prior to commencement of construction. Surveys will focus on the period between May and September where possible. Survey would cover the whole of the Order Limits, including the c.10% of the route which was inaccessible for baseline pre-application surveys in 2020-2021. Habitats of 'High distinctiveness' (per UKHab definitions) would be surveyed within <12 months of completion of the final Biodiversity Net Gain (BNG) calculations. The survey would identify and map all habitats within the Order Limits, and would be 'extended' to include an appraisal of protected species potential (further detail provided below)	Habitat conditions within the Order Limits may have changed since the baseline, pre-application surveys in 2020 and 2021. It is important that mitigation and micro-siting measures account for the contemporary ecological situation. For example, the micro-siting approach will aim to align the construction footprint with existing hedgerow gaps in order to minimise the amount of hedgerow removal required; this will require up-to-date information on existing hedgerow gaps, because information on hedgerow gaps collected in 2020-21 may no longer be accurate (gaps may have been replanted, new gaps may have opened up etc.). The BNG calculations will also need to be refined to account for the contemporary conditions (and other characteristics) of Habitats, Hedgerows and Rivers and Streams. The updated information will help inform the package of mitigation, compensation and enhancement measures which are required both to address construction-related impacts under the Mitigation Hierarchy, and also to achieve net gains through the BNG Metric. The updated habitat survey will also record the presence of any Invasive Non-Native Species (INNS) of plants such as Himalayan balsam which was recorded at a number of sites during the 2020-21 surveys. It is possible that INNS may have spread or new ones may have been introduced since the baseline surveys, so updates are necessary to ensure appropriate mitigation measures (i.e. bio-security controls) are implemented at sites with INNS.

Survey type	Proposed survey scope and timing	Justification
Badger survey	A walkover survey to be completed at the same time as the UKHab survey (above), covering the whole of the Order Limits plus a surrounding 30m buffer.	<p>The distribution and nature of badger presence within and around the Order Limits may have changed since the baseline, pre-application surveys in 2020-21. Furthermore, approximately 10% of the Order Limits has not yet been surveyed due to restricted landowner access (but there are expected to be no access restrictions for pre-construction surveys). An updated survey is therefore required to ensure that the mitigation package appropriately addresses risks to badgers, particularly to any active setts.</p> <p>While it is acknowledged that late autumn to spring can be an optimal badger survey season (due to lower levels of vegetation growth which can obscure surveyor views of badger signs), it is proposed to complete a badger walkover survey at the same time as the UKHab survey in the interests of survey efficiency and to reduce disruption to landowners.</p>
Badger surveys of setts targeted for closure under Badger Licence/s	<p>Precise scope and timing to be confirmed. Assuming there are active setts which would need to be closed under licence, the scope would likely involve trail camera monitoring and 'soft-closure' of holes (i.e. bracing small sticks at sett entrances which badgers dislodge as they enter/exit the tunnels) to confirm the status of setts. Ground Penetrating Radar may be used if it becomes necessary to establish the precise subterranean extent of particularly setts. If Main setts require closure, it is likely that further surveys would be required to establish the territorial range of the resident badgers, in order that the compensatory sett (which must be constructed prior to closure of a main sett) can be provided within that same territory. This may include bait marking surveys.</p>	<p>Badger setts can only be closed under licence between July and November inclusive, and survey data on such setts should be no more than 2-3 months old at the time of submission of the licence application. Construction works associated with SEP and DEP are expected to run for approximately two years (in the concurrent construction scenario), and will occur in sections, meaning construction works on some parts of the route could be completed >18 months (approximately) before works on other stages were commenced. The timing of any surveys of setts targeted for closure under a Badger Licence will therefore depend on when relevant construction works are due to take place.</p> <p>Any sett closures would follow the established Natural England Badger Licensing process which ensures that badger legislation and best-practice measures are fully adhered to throughout.</p>
Bat roost appraisals	To be completed at the same time as the UKHab survey (above), covering the whole of the Order Limits and a surrounding buffer of 50m. All features (namely trees but also any other structures such as buildings) with bat roost potential within this area would be included within the appraisal. The appraisal would be completed from ground-level,	The 2020-21 surveys appraised the bat roost potential of all features within accessible parts (approximately 90%) of the Order Limits. Features with High or Moderate potential (per Bat Conservation Trust guidelines) which were also at risk of being impacted were subject to further surveys. Of all trees within the surveyed parts of the Order Limits (estimated >100 trees in open countryside plus thousands of trees within woodlands), the construction works were able to commit to avoidance of the majority. A total of 13 trees with Moderate bat roost potential could not be avoided and so were

Survey type	Proposed survey scope and timing	Justification
	and it would determine if any further surveys (e.g. aerial/tree-climbing surveys or bat roost emergence/re-entry surveys) are warranted on the basis of the potential of the feature to support roosting bats.	subject to further surveys (bat emergence/re-entry surveys) in August and September 2021 to confirm their bat roost status. However, the roost potential of features such as trees can change over time, such as from storm damage, general decay and human management. It is therefore important that the roost status of features within the Order Limits is based on an up-to-date survey of the whole area.
Bat roost inspection surveys to inform the Bat European Protected Species (EPS) Mitigation Licence	Precise scope and timing to be confirmed, although surveys would be completed in the year prior to the relevant construction works commencing. If the roost appraisal finds features (i.e. trees) which are at risk of removal, which have roost potential, and which are suitable for detailed inspections to ascertain their roost status, then targeted surveys of such features can be completed. This would likely involve aerial inspections by suitably licensed and experienced ecologists who are qualified to climb trees to inspect the features within the trees for bats and signs of roosting bats.	Bat roost inspections are possible at any time of year but are not always possible on trees due to safety concerns and access constraints. Any roost inspections will therefore only be completed if trees (or other structures) can be thoroughly inspected and the inspection would add value to the understanding of the roost status. Inspections may clarify the hibernation suitability and status of trees by identifying suitable niches/cavities which provide suitable hibernating conditions, or by finding hibernating bats themselves within trees during winter inspections. The purpose of bat roost inspection survey data would be to inform the Bat EPS Mitigation Licence application. As data used to support EPS licence applications for bats should be from the most recent or current survey season, any inspections would be completed within <12 months of proposed works to the tree/structure to ensure the data is valid for use in support of a licence.
Bat roost emergence and/or re-entry surveys to inform the Bat EPS Mitigation Licence	Any tree/other feature with Moderate bat roost potential would be subject to two surveys and any with High potential would have three surveys. The surveys would be completed between May and August in the survey season immediately preceding the relevant construction works. They would be completed in accordance with current Bat Conservation Trust survey guidelines; presently this comprises monitoring the tree/structure from 15 minutes before sunset to at least 90 minutes post-sunset (for dusk emergence surveys) or from 90 minutes pre-sunrise to 15 minutes post sunrise (for dawn re-entry surveys).	Bat roosts in trees (and other features) can be highly changeable. Therefore it is important to ensure that the Bat EPS Mitigation Licence is based on current data on the species and nature of roost/s in any trees at risk of being felled or otherwise impacted. Natural England requires that bat survey data used in support of a licence application must be from the most recent/current survey season. This means that data collected in May-August in any given year will only remain suitable for use in support of a licence if the application is submitted prior to May the following year; after this point, updated surveys would become necessary. Clearly, therefore, data from the 2021 surveys would not be suitable for use in a licence application to be submitted in the future. Any impacts to or removal of features with confirmed bat roosts would follow the established Natural England Bat EPS Licensing process which ensures that bat legislation and best-practice measures are fully adhered to throughout.
Bat activity surveys	Surveys would involve the use of automated, static bat detectors deployed at potentially sensitive positions throughout the Order Limits where there is considered to be a risk of impacts to foraging or commuting bats, or to some other form of bat	At the time of the pre-application surveys in 2020-2021, the construction parameters were not sufficiently defined to inform the bat survey scope, as it was not known which hedgerows/boundary features would be impacted and which could be avoided (e.g. by HDD). This detail will be available at pre-construction stage, so will inform the scope of

Survey type	Proposed survey scope and timing	Justification
	<p>activity. This will comprise surveys of hedgerows, ditches and other boundary features which are at risk of being impacted/temporarily severed by construction works, and which have potential connectivity importance. Hedgerow boundaries between and around Alderford Common SSSI have already been scoped in as requiring surveys on this basis. Other areas of potential sensitivity such as the Onshore Substation and Horizontal Directional Drilling compounds will also be surveyed if these are to be sited in areas of potential sensitivity to bats.</p> <p>Surveys would be completed from April to October (or May to September if covering less sensitive areas) in the year prior to construction works commencing.</p>	<p>bat surveys at that time. Data from these bat surveys will inform precise mitigation approaches at each surveyed area/crossing point.</p>
Breeding bird surveys	<p>No further surveys proposed (unless the updated habitat surveys find significant areas of new or previously unknown habitat which could be important for certain species of breeding birds, such as nightjar and woodlark in areas of newly clear-felled woodland, or turtle dove in new areas of scrub, for example).</p> <p>Surveys would be carried out at an appropriate season for the species targeted (this could start as early as mid-February in the case of woodlark and finish as late as July for nightjar and turtle dove)</p>	<p>The surveys completed in 2020 and particularly in 2021 achieved wide coverage of the Order Limits and informed a comprehensive assessment of the breeding bird issues/assemblage. This included a thorough skylark assessment based on extrapolation of data from a range of sample sites, as was agreed during ETG meetings in 2020. A robust mitigation package has been proposed for breeding birds to ensure the risks of damage, destruction or disturbance of active nests is minimised. Given the anticipated effectiveness of the mitigation measures committed to, there is considered to be no need to resurvey the Order Limits because data from such surveys would not alter the mitigation approach. For example, updated surveys might find slight variations in the numbers and distributions of skylark or other birds nesting within and around the Order Limits, but this would not change the mitigation approach.</p>
Over-wintering bird surveys	<p>No further surveys proposed</p>	<p>The surveys completed in winter 2019-20 and particularly in winter 2020-21 achieved suitable coverage of relevant parts of the Order Limits with potential sensitivity for wintering birds. The survey results informed a thorough assessment of the wintering bird issues and informed a robust mitigation approach. Given the anticipated effectiveness of the mitigation measures committed to, there is considered to be no need to resurvey the Order Limits because data from such surveys would not alter the mitigation approach. For example, updated surveys might find slight variations in the numbers and distributions of birds, or may record new wintering birds within the Order</p>

Survey type	Proposed survey scope and timing	Justification
		Limits (such as pink-footed geese, which were not recorded within the survey area in either of the wintering bird surveys), but this would not change the mitigation approach.
Great crested newt eDNA surveys	To be confirmed following consultation with Natural England's District Level Licensing team. If updated surveys are required, they would likely cover all ponds within the Order Limits and surrounding 250 metres. The eDNA surveys would take place between 15 th April and 30 th June within less than three years prior to construction works commencing. This accords with the DLL data validity period of four years (with year one being the year in which the surveys take place).	SEP and DEP is pursuing District Level Licensing (DLL) to mitigate for impacts to great crested newts (GCN). Pre-application surveys of all accessible ponds within 250m of the Order Limits were completed between 2020 and 2021, and informed a draft DLL application submitted in 2022. A draft Impact Assessment and Conservation Payment Certificate (IACPC) has been issued by Natural England, confirming that SEP and DEP will qualify for DLL. However, the precise financial contribution due to be paid to Natural England to finalise the DLL and fund the required offsite mitigation <u>may</u> need data from within four years of the date of submission of the licence application (four years is the standard timeframe within which survey data is considered acceptable for use within a DLL application). This four-year timeframe considers that year one is the year in which the data was collected, meaning data from 2020 will have expired after June 2023 and data from 2021 surveys will have expired after June 2024. The Applicant is proposing to submit a finalised DLL application within three months of the construction works start date, so at that time all the pre-application survey data will have technically expired. However, the Applicant will consult with Natural England's DLL department to discuss the survey requirement; given the unusual nature of this particular project (covering over 150 ponds and the fact that some data may have only just have passed the four-year threshold) there may be options for refining the scope of updated surveys.
Reptile surveys	No further surveys proposed (unless the updated habitat surveys find significant areas of new or previously unknown habitat suitable for reptiles, or other new information comes to light such as new NBIS records of reptiles in a previously un-surveyed area).	The surveys completed in spring/summer 2021 achieved suitable coverage of parts of the Order Limits with suitable habitat for reptiles. Of the 15 sites surveyed, reptiles were confirmed present at 11 of them. The survey results informed a comprehensive assessment and robust mitigation approach. Given the anticipated effectiveness of the mitigation measures already committed to, there is considered to be no need to resurvey the Order Limits because data from such surveys would not alter the mitigation approach. For example, updated surveys might find slight variations in the numbers and distributions of reptiles at certain sites (although it is considered more likely that surveys would reconfirm the same species and same populations at the sites as were found in 2021) but this would not change the mitigation approach.
Riparian mammal (otter and water vole) surveys	No further surveys proposed (unless the updated habitat surveys find new features suitable for these species which have not previously been surveyed or that new features have developed or been created by a river habitat improvement project and	The pre-application surveys completed in 2021 covered all watercourses considered to provide potentially suitable habitat for riparian mammals. However, the proposed crossing schedule shows that all these watercourses are not due to be impacted during construction because of the use of HDD at all these locations. There is

Survey type	Proposed survey scope and timing	Justification
	<p>which are at risk of being impacted by the construction works).</p>	<p>therefore considered to be no realistic risk of impacts to riparian mammals, and so no further surveys of these watercourses are proposed.</p> <p>In the unlikely event that the updated habitat survey finds new and previously unknown watercourses which are suitable for these species or that new features have developed or been created by a river habitat improvement project and where the watercourse is due to be impacted (i.e. it is not a watercourse which would be crossed using HDD), it would be surveyed for signs of riparian mammal presence, during spring and summer in the period up to two years prior to construction works commencing (i.e. surveys would be completed whenever any such watercourses were identified).</p>
<p>White-clawed crayfish surveys</p>	<p>No further surveys proposed (unless the updated habitat surveys find new features suitable for this species which have not previously been surveyed or that new features have developed or been created by a river habitat improvement project and which are at risk of being impacted by the construction works).</p>	<p>The pre-application surveys completed in 2021 covered all watercourses considered to provide potentially suitable habitat for white-clawed crayfish (WCC). However, the proposed crossing schedule shows that all these watercourses are not due to be impacted during construction because of the use of HDD at all these locations. There is therefore considered to be no realistic risk of impacts to WCC, and so no further surveys of these watercourses are proposed.</p> <p>In the unlikely event that the updated habitat survey finds new and previously unknown watercourses which are suitable for WCC or that new features have developed or been created by a river habitat improvement project and where the watercourse is due to be impacted (i.e. it is not a watercourse which would be crossed using HDD), it would be surveyed for WCC using eDNA sampling during summer in the period up to two years prior to construction works commencing (i.e. surveys would be completed whenever any such watercourses were identified).</p> <p>In order to address INNS and bio-security concerns over American signal crayfish and associated crayfish plague, any watercourses which are a) connected to watercourses known to support this INNS, b) suitable for crayfish, and c) which are due to be impacted (i.e. non-HDD crossings of watercourses), will be eDNA sampled for WCC and American signal crayfish. The survey results will inform the mitigation measures and bio-security protocols at any watercourse crossings.</p>
<p>National Vegetation Classification (NVC) surveys</p>	<p>No further surveys proposed (unless the updated habitat surveys find new areas of particularly sensitive habitats which would warrant such surveys).</p>	<p>The pre-application NVC surveys in 2021 focused on the coastal grassland at the landfall location, where it was important to understand the precise distribution of particular grassland habitats in order to inform the construction footprint and mitigation requirements. There are not expected to be other, equivalently sensitive habitats elsewhere within the Order Limits and therefore there is not anticipated to be any updated survey requirement.</p> <p>In the unlikely event that the updated habitat survey finds new and previously unknown habitats which warrant NVC surveys, and where the habitat is due to be impacted, it</p>

Survey type	Proposed survey scope and timing	Justification
		would be NVC surveyed during summer in the period up to two years prior to construction works commencing (i.e. surveys would be completed whenever any such habitat/s were identified).