AENC-ARC-ENV-REP-0001

Norwich to Tilbury

Volume 5: Reports and Statements

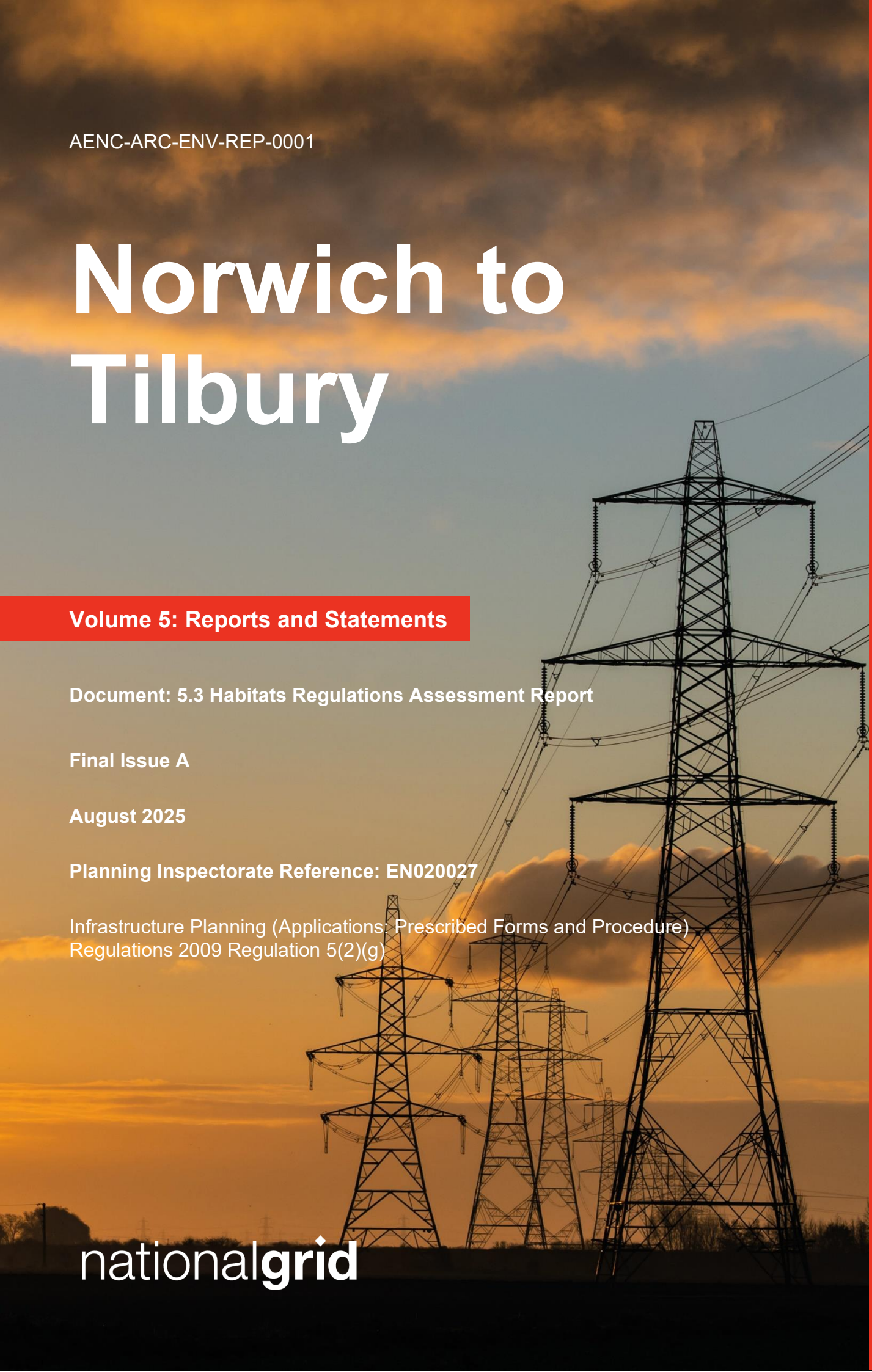
Document: 5.3 Habitats Regulations Assessment Report

Final Issue A

August 2025

Planning Inspectorate Reference: EN020027

Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009 Regulation 5(2)(g)



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Executive Summary

Purpose of this Report

National Grid has developed plans for Norwich to Tilbury (the 'Project'). The Project would support the UK's net zero target through the connection of new low carbon energy generation in East Anglia and by reinforcing the transmission network.

The Project comprises reinforcement of the transmission network between the existing Norwich Main Substation in Norfolk and Tilbury Substation in Essex, via Bramford Substation, the new East Anglia Connection Node (EACN) Substation and the new Tilbury North Substation.

This report to inform the Habitats Regulations Assessment (HRA) has been prepared on behalf of National Grid. It forms part of the application for a Development Consent Order (DCO) for the Project submitted to the Secretary of State, under Section 37 of The Planning Act (2008).

While the HRA decisions must be undertaken by the competent authority (the Secretary of State as advised by the Planning Inspectorate as Examining Authority in the context of the DCO application), the information needed to undertake the necessary assessments must be provided by the applicant. The information needed for the competent authority to establish whether there are any likely significant effects (LSEs) or adverse effects on site integrity that could arise as a result of the Project is therefore provided in this Report. The Project and the Order Limits are shown on Environmental Statement (ES) Figure 4.1: Proposed Project Design (document reference 6.4.F1) and Figure 4.2: Proposed Project Design – Permanent Features (document reference 6.4.F2).

Consultation with Natural England

As required by Planning Inspectorate's Advice Page on HRA, and good practice, the HRA and its emerging findings have been shared with Natural England on a regular basis during 2024 and 2025. This has been through a combination of meetings and document sharing. A draft copy of this HRA report was also shared with Natural England prior to the submission of the DCO application in July 2025. The formal response has confirmed Natural England are in agreement with the conclusions of this report (refer to Appendix B: Consultation Documents). The comments received and how they have been addressed in this report are summarised in Section 1.4.

HRA Stage 1: Screening

The objective of the Likely Significant Effects (LSEs) test is to assess whether the Project, without any mitigation, is likely to result in a LSE on a European Site or its qualifying features. Where it is deemed unlikely for the Project to result in LSEs on European Sites, usually because there is no mechanism for an adverse interaction (i.e., a pathway), these aspects can be 'screened out'. If the risk of a LSE cannot be ruled out alone on the basis of objective scientific evidence and in the absence of mitigation, a precautionary approach is applied, and remaining aspects are taken forward to an Appropriate Assessment. The screening stage must also consider the potential for LSEs 'in-combination' with other plans and projects.

The Study Area and Zone of Influence (ZoI) are described in the main body of the report. The former has been defined as 20 km from the Order Limits, while the ZoI is the geographical area around a Project in which potential LSEs could occur either directly or indirectly.

Given the length of the Project (approximately 180 km) and the significant size of the Study Area, screening has been broken down into two phases, 'pre-screening' and 'detailed screening':

- Pre-screening scopes out European Sites where they fall within the Study Area[1] but have no correlation with identified ZoIs. There are no foreseeable impact pathways beyond identified ZoIs and therefore no LSEs are considered to occur outside this area
- Detailed screening focusses on European Sites that overlap with the ZoIs and where there is the potential for LSEs due to a clear impact pathway which has been discussed with Natural England.

European Sites Identified Within the Study Area

Fifteen Special Protection Areas (SPAs), twelve Ramsar sites and one Special Area of Conservation (SAC) were identified within the Study Area and have been subject to HRA pre-screening. Twenty-three of those sites were scoped out at this stage and the remaining five proceeded to detailed screening.

The five European Sites progressed to detailed screening include:

- Norfolk Valley Fens SAC
- Stour and Orwell Estuaries Ramsar Site
- Stour and Orwell Estuaries SPA
- Thames Estuary and Marshes Ramsar Site
- Thames Estuary and Marshes SPA.

Norfolk Valley Fens SAC

LSEs associated with changes in hydrology such as surface and ground water quality could not be ruled out for the following works (in the absence of mitigation):

- Proposed construction of a temporary haul road and the base of pylon RG24 would be within 50 m of the watercourse that downstream, flows adjacent to the SAC
- Existing UK Power Networks (UKPN) wooden pole lines proposed to be undergrounded to avoid conflict with the new 400 kilovolt (kV) overhead line, which would involve digging trenches within 30 m of this watercourse, as well as crossing the watercourse
- Proposed activities for the stringing of new conductors for the new 400 kV overhead line which would directly cross the watercourse.

[1] Study Area is defined as 2 km for SACs, extended to 30 km if bats are a qualifying feature. 2 km for SPAs and Ramsar sites, extended to 20 km if birds are a qualifying feature.

Stour and Orwell Estuaries SPA and Ramsar Site

Functionally Linked Land (FLL) has been identified in two areas within the Order Limits, with habitats supporting significant numbers of lapwing and golden plover which are part of the waterbird assemblage qualifying feature of both the SPA and Ramsar Site. The locations of FLL are shown on Figure 4: Stour and Orwell Estuaries Functionally Linked Land in Appendix C: Figures.

As FLL is considered to support qualifying features of the SPA and Ramsar Site, any potential LSEs on FLL would also mean LSEs on the SPA and Ramsar Site cannot be ruled out.

LSEs on FLL associated with temporary land loss; fragmentation of habitat; disturbance (from a change in noise, vibration, light and movement); changes in air quality (from dust and vehicle emissions) and changes in hydrology (surface and ground water quality) could not be ruled out for the following works (in the absence of mitigation):

- Underground cabling is proposed through the two areas of FLL and would require a 120 m wide excavation and working area (combined), a compound area, a laydown area and attenuation ponds.

Direct LSEs on the SPA and Ramsar Site (rather than FLL) due to changes in hydrology (surface and ground water quality) also could not be ruled out for the following works (in the absence of mitigation):

- Two trenchless crossings of the River Stour are proposed (which is hydraulically linked to the SPA and Ramsar Site), and three temporary attenuation drainage ponds are proposed to drain into the river, with a fourth draining into Langham Lake which connects to the river when flooded. These works are located approximately 5.5 km upstream of the SPA / Ramsar Site.

Thames Estuary and Marshes SPA and Ramsar Site

No LSEs were identified during the detailed screening stage, primarily due to the distance of the Order Limits from the Thames Estuary and Marshes SPA and Ramsar Site, and the fact no significant numbers of bird species forming qualifying features were recorded during survey work. This was agreed with Natural England as shown in the letter in Appendix B: Consultation Documents.

The following three European Sites were therefore taken forward to HRA Stage 2: Appropriate Assessment:

- Norfolk Valley Fens SAC
- Stour and Orwell Estuaries Ramsar Site
- Stour and Orwell Estuaries SPA.

All LSEs identified during the screening stage related to the construction phase of the Project. No LSEs during the operation (and maintenance) phase were identified and carried forward to Stage 2 Appropriate Assessment.

In-Combination Effects

In accordance with the Advice Page - Nationally Significant Infrastructure Project: Advice on Habitats Regulations Assessments (Planning Inspectorate, 2025), the HRA Stage 1 Screening considered a range of other plans and projects that could give rise to in-combination effects.

This includes projects under construction, permitted but not yet implemented, submitted but undetermined applications and appeals. A review of the Environmental Statement Appendix 17.2: Long List and Short List of Other Developments (document reference 6.17.A2) helped identify relevant plans or projects. Only those within the Impact Risk Zone (IRZ) of a European Site and the Zone of Influence (ZoI) for the Project were considered in the in-combination assessment, ruling out most small-scale developments.

Due to the Project's specific impact pathways, only other linear or energy transmission projects were considered to pose a likely significant in-combination effect. As a result, nine key projects were identified for further consideration:

- Bramford to Twinstead
- Five Estuaries Offshore Wind Farm
- North Falls Offshore Wind Farm
- A12 Chelmsford to A120 Widening
- East Anglia Three
- Lower Thames Crossing
- Thurrock Flexible Generation Plant
- Tilbury to Grain and Tilbury to Kingsnorth (TRKE)
- Tilbury 3.

Following the Stage 1 – Screening of likely significant in-combination effects, three of the above projects could not be screened out of further assessment, and as such are progressed to Stage 2 – Appropriate Assessment. These projects are:

- Bramford to Twinstead
- Five Estuaries Offshore Wind Farm
- North Falls Offshore Wind Farm.

HRA Stage 2: Appropriate Assessment

Where it is determined at the screening stage that LSEs cannot be ruled out (in the absence of mitigation), the HRA assessment proceeds to the next stage of HRA known as Appropriate Assessment. Case law has clarified that 'Appropriate Assessment' is not a technical term. In other words, there are no specific technical analyses, or level of detail, that are classified by law as belonging to Appropriate Assessment rather than the screening for LSEs. The Appropriate Assessment constitutes whatever level of further assessment is required to determine whether an adverse effect on site integrity can be ruled out.

Norfolk Valley Fens SAC

Changes in Hydrology – Surface and Ground Water Quality

The following works were identified that could result in sedimentation and / or pollution effects on the SAC:

- The haul road and the base of pylon RG24 would be constructed within 50 m of the watercourse that downstream flows adjacent to the SAC
- UKPN wooden pole lines would be undergrounded to avoid conflict with the new 400 kV overhead line; this would involve trenching within 30 m of the watercourse which flows adjacent to the SAC, as well as crossing the watercourse
- The stringing of new conductors for the new 400 kV overhead line would directly cross the watercourse. Potential changes in the ground and surface water arising from construction activities may lead to the degradation of habitats within the SAC.

Standard mitigation measures (good practice measures) set out in the Outline Code of Construction Practice (CoCP) (document reference 7.2) and secured by Requirement 4 of the draft DCO (document reference 3.1) would be adhered to during the construction phase. These mitigation measures would ensure **no adverse effect on the integrity** of the Norfolk Valley Fens SAC through hydrology.

Stour and Orwell Estuaries SPA / Ramsar Site

Changes in Hydrology – Surface and Ground Water Quality

The following works were identified that could affect hydrology such as surface and ground water quality on FLL associated with the SPA and Ramsar Site:

- Underground cabling within two areas of FLL that have been identified within the Order Limits. Attenuation ponds are proposed within both areas, draining into existing field ditches / drains.

The following works were identified that could affect hydrology such as surface and ground water quality on the SPA and Ramsar Site directly (rather than FLL):

- Trenchless crossing of the River Stour at two locations. One is approximately 5.5 km upstream of the SPA and Ramsar Site, while the other is over 6 km upstream. The crossing closest to the SPA and Ramsar Site has a construction access road and working area approximately 50 m from the watercourse, while the other crossing working area is approximately 60 m from the watercourse
- Three attenuation ponds would drain into the river with a fourth into Langham Lake which is hydrologically connected to the river when flooded. Two of these are situated around the closest crossing, with the others approximately 5.4 km upstream of the SPA and Ramsar Site.

The attenuation ponds are proposed to manage excess water and prevent flooding. They would store stormwater while gradually releasing at greenfield rates. In addition, the risk of working pollution incidents would be controlled by standard mitigation measures (good practice measures) set out in the Outline CoCP (document reference 7.2) secured through Requirement 4 of the draft DCO (document reference 3.1). These mitigation measures would be adhered to

during the construction phase and would ensure **no adverse effect on the integrity** of the Stour and Orwell Estuaries SPA / Ramsar Site through hydrology.

Changes in Air Quality from Dust and Vehicle Emissions

The following works were identified that could affect air quality (dust and vehicle emissions) on FLL associated with the SPA and Ramsar Site:

- The installation of the underground cable through the two areas of FLL would require a 120 m wide excavation and working area (combined), a compound area, a laydown area and attenuation ponds. The working activities (dust creation) and use of vehicles and machinery (emissions) for these works have the potential to effect FLL outside the Order Limits within a 200 m ZoI.

FLL consists of arable land which is subject to farming practices including cultivating and spraying with fertiliser and chemicals. The potential effects from construction air quality are insignificant compared to this management of land. This is supported by the fact arable land is not a habitat that is considered in the Habitat Impact section of the Air Pollution Information System (APIS) when emission pollutants are selected. Therefore, the FLL habitats are not considered to be vulnerable to air quality effects

The implementation of the Outline Dust Management Plan within the Outline CoCP (document reference 7.2), secured through Requirement 4 of the draft DCO (document reference 3.1), would further ensure no air quality pollution incidents would occur at FLL. Therefore, there would be no adverse effects on the integrity of the Stour and Orwell Estuaries SPA and Ramsar Site through changes in air quality.

Habitat Loss, Fragmentation and Disturbance

The following works were identified that could affect habitat loss and disturbance on FLL associated with the SPA and Ramsar Site:

- The installation of the underground cable through the two areas of FLL would require a 120 m wide excavation and working area (combined), a compound area, a laydown area and attenuation ponds. This would lead to the temporary loss and fragmentation of FLL
- The above construction works could also cause disturbance (noise, vibration, light and visual) across the remaining FLL as it falls within a 500 m ZoI.

Once the underground cabling works are complete, the land would be returned to agriculture (within the timeframe of the Project programme) to be farmed in a similar manner as it was prior to construction. It is therefore assumed that the land would continue to constitute FLL and there would be **no adverse effects on the integrity** of the ecological function it provides to the Stour and Orwell Estuaries SPA / Ramsar Site.

A desk study was undertaken and demonstrated there is sufficient available alternative habitat within the 5 km Impact Risk Zone of the Stour and Orwell Estuaries SPA and Ramsar Site, that would support lapwing and golden plover that are likely to be temporarily displaced by the construction works. It was agreed with Natural England that this was sufficient to mitigate for the temporary land loss, fragmentation of habitat and disturbance through change in noise, vibration, light and movement during the construction phase (as shown in Appendix B: Consultation Documents). Therefore, it is considered that the Project would **not adversely affect the integrity** of the Stour and Orwell Estuaries SPA and Ramsar Site.

In-Combination Effects

Details of other plans or projects that had the potential to give rise to in-combination effects was undertaken as part of Stage 1 – Screening. The only projects where a likely significant in-combination effect couldn't be ruled out were Bramford to Twinstead, Five Estuaries Offshore Wind Farm and North Falls Offshore Wind Farm.

Bramford to Twinstead and the Project could not screen out the potential for LSEs on the Stour and Orwell SPA and Ramsar Site that may arise from a reduction in surface water and ground water quality and therefore proceeded to Appropriate Assessment. The Bramford to Twinstead HRA (National Grid, 2024) and the Project both concluded that, with the implementation of appropriate mitigation measures, there would be no adverse effect on the integrity of the SPA and Ramsar Site alone or in-combination as mitigation would avoid pollution and sedimentation incidents. Therefore, it was concluded that delivery of both projects could be managed without an adverse 'in-combination' effect on the integrity of qualifying features of the Stour and Orwell Estuaries SPA and Ramsar Site or any other European Site.

The Order Limits for the two Offshore Wind Farm projects overlap in an areas where the potential for in-combination effects with the Norwich to Tilbury Project were identified (where they connect into the proposed new EACN Substation). The potential in-combination effects relate to habitat loss and disturbance to qualifying features (lapwing) using potential FLL.

The construction programme for all three projects would overlap and they affect a similar area of arable land. All three projects conclude in their HRA Reports that there is sufficient alternative habitat for the affected species (i.e. Lapwing) to use as FLL and that no significant effects would arise. It was therefore concluded that delivery of the three projects would not lead to an adverse **in-combination effect on the integrity** of qualifying features of the Stour and Orwell Estuaries SPA and Ramsar Site or any other European Site. This conclusion has been agreed with Natural England (refer to Appendix B: Consultation Documents).

Summary

The Appropriate Assessment concludes that the Project (either alone or in-combination with other plans or projects) would not have an adverse effect on the integrity of the Norfolk Valley Fens SAC or the Stour and Orwell Estuaries SPA and Ramsar Site following the HRA Stage 2 – Appropriate Assessment after the implementation of mitigation measures, compliance with which is to be secured through Requirement 4 of the draft DCO (document reference 3.1). The conclusions of this report have been **agreed with Natural England** (refer to Appendix B: Consultation Documents).

1. Introduction

1.1 Background

1.1.1 National Grid has developed plans for Norwich to Tilbury (the 'Project'). The Project would support the UK's net zero target through the connection of new low carbon energy generation in East Anglia and by reinforcing the transmission network.

1.1.2 The Project comprises reinforcement of the transmission network between the existing Norwich Main Substation in Norfolk and Tilbury Substation in Essex, via Bramford Substation, the new East Anglia Connection Node (EACN) Substation and the new Tilbury North Substation.

1.1.3 This report to inform the Secretary of State's Habitats Regulations Assessment (HRA) for the Project has been prepared on behalf of National Grid. It forms part of the application for a Development Consent Order (DCO) for the Project submitted to the Secretary of State, under Section 37 of the Planning Act (2008).

1.1.4 The requirement for HRA is established through Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora, here within referred to as the 'Habitats Directive', in Articles 6(3) and 6(4). The Habitats Directive is transposed into national legislation by the Conservation of Habitats and Species Regulations 2017 (as amended) (referred to as the 'Habitats Regulations' (2017)).

1.1.5 Under Regulation 63, any project that is likely to have a significant effect on a European Site (either alone or in-combination with other plans or projects) and is not directly connected with, or necessary for the management of the site, must be subject to an Appropriate Assessment to determine the implications for the site in view of its conservation objectives.

1.1.6 The purpose of this report is to provide all the relevant information needed for the Secretary of State (the relevant competent authority for the DCO application) to undertake Stage 1 and 2 of a Habitats Regulations Assessment as required under the Habitats Regulations. This document contains a full consideration of Likely Significant Effects (LSEs) alongside an assessment to inform an Appropriate Assessment.

1.1.7 The Project and the Order Limits are shown on Environmental Statement (ES) Figure 4.1: Proposed Project Design (document reference 6.4.F1).

1.1.8 This report has been informed by the following ES Chapters:

- Chapter 7: Air Quality (document reference 6.7)
- Chapter 8: Ecology and Biodiversity (document reference 6.8)
- Chapter 12: Hydrology, Land Drainage and Flood Risk (document reference 6.12)
- Chapter 14: Noise and Vibration (document reference 6.14).

1.2 Background to Habitats Regulations Assessment (HRA)

1.2.1 National Site Network (NSN) Sites form part of the network of areas designated to conserve natural habitats and species that are rare for which consideration of a HRA is necessary. They include Special Protection Areas (SPAs) and Special Areas of Conservation (SACs). These sites along with Ramsar Sites are collectively referred to as 'European Sites' within the Habitats Regulations and throughout this report.

1.2.2 In addition, it is a matter of law that candidate Special Areas of Conservation (cSACs) and Sites of Community Importance (SCIs) are considered in the HRA process; furthermore, it is UK government policy that sites designated under the 1971 Ramsar Convention for their internationally important wetlands (Ramsar Sites) and potential Special Protection Areas (pSPAs) are also considered. The requirements of the Habitats Directive are transposed into English law by means of the Habitats Regulations.

1.2.3 Regulation 63(1), Part 6 of the Habitats Regulations states that: '*A competent authority, before deciding to undertake, or give consent, permission or other authorisation for, a plan or project which (a) is likely to have a significant effect on a European Site or a European offshore marine site (either alone or in combination with other plans or projects), and (b) is not directly connected with or necessary to the management of the site, must make an appropriate assessment of the implications of the plan or project for that site in view of that site's conservation objectives*'.

1.2.4 Regulation 63(5) of Part 6 of the Habitats Regulations provides that: *'In the light of the conclusions of the assessment, and subject to regulation 64, the competent authority may agree to the plan or project only after having ascertained that it will not adversely affect the integrity of the European Site or the European offshore marine site (as the case may be)'*.

1.2.5 Regulation 64, Part 6 of the Habitats Regulations states that: *'If the competent authority is satisfied that, there being no alternative solutions, the plan or project must be carried out for imperative reasons of overriding public interest (which, subject to paragraph (2), may be of a social or economic nature), it may agree to the plan or project notwithstanding a negative assessment of the implications for the European Site or the European offshore marine site (as the case may be)*'.

1.2.6 Regulation 68, Part 6 of the Habitats Regulations states that: *'Where, in accordance with regulation 64* [Considerations of overriding public interest]— *(a) a plan or project is agreed to, notwithstanding a negative assessment of the implications for a European Site or a European offshore marine site, or (b) a decision, or a consent, permission or other authorisation, is affirmed on review, notwithstanding such an assessment,— the appropriate authority must secure that any necessary compensatory measures are taken to ensure that the overall coherence of Natura 2000 is protected*'.

1.2.7 Advice Page: Nationally Significant Infrastructure Projects: Advice on habitats Regulations Assessments (Planning Inspectorate, March 2025) outlines the stages of HRA as:

- ***'Screening** – to check if the proposal is likely to have a significant effect on the European Site's conservation objectives, alone or in combination with other plans or projects.*

- ***Appropriate assessment/consideration of effects on site integrity*** *– to assess the implications of the proposal for the qualifying features of the European Site or sites, in view of the site's conservation objectives, and identify ways to avoid or minimise any effects.*
- ***Derogation*** *– to consider if proposals that would have an adverse effect on the integrity of a European Site qualify for an exemption (Planning Inspectorate, 2025)'.*

1.2.8 If the screening (the first stage of the process) cannot conclude (in the absence of mitigation) there would be no LSEs on a European Site, then an Appropriate Assessment must be undertaken to determine whether an adverse effect on the integrity of the European Site(s) (in view of the sites' conservation objectives) can be ruled out, when assessed alone or in combination with other plans or projects .

1.2.9 Where an adverse effect on integrity of the European Site cannot be ruled out, Stage 3 derogation of the HRA process is engaged and a project can only proceed where three legal tests are satisfied. Each test must be passed in turn for a derogation to be granted. If during the pre-application stage, an appropriate nature conservation body indicates that the project is likely to adversely affect a European Site either alone or in combination with other plans or projects, Applicants should include with their DCO application such information as may reasonably be required to assess potential derogations under the Habitats Regulations[2]. This information can be provided with the DCO application 'without prejudice' to the Secretary of State's final decision on whether the derogation stage is engaged. The three tests are as follows:

- **Test 1:** there must be an absence of alternatives to the Project - 'Assessment of Alternative Solutions'
- **Test 2:** the Project must be carried out for 'imperative reasons of overriding public interest'
- **Test 3:** compensatory measures which would maintain the coherence of the UK National Site Network must be secured.

1.2.10 Where the stage 3 derogation is engaged as part of the HRA process, each test must be passed in sequence for the Project to proceed.

1.3 Purpose of this Report

1.3.1 The purpose of this report is to provide all the relevant information needed for the Secretary of State (the relevant competent authority for the DCO application) to undertake Stage 1 and 2 of a Habitats Regulations Assessment as required under the Habitats Regulations.

1.3.2 This report to inform the HRA comprises HRA Stage 1: Screening and HRA Stage 2: Appropriate Assessment. It builds on a Scoping Report issued to Natural England in September 2023 to determine:

- The European Sites that may be affected by the Project

[2] As stated under UK government guidance relating to the Planning Act 2008 and the Development Consent Order process for Nationally Significant Infrastructure Projects.

- Potential impact pathways likely associated with the construction and operation (and maintenance) phases of the Project
- Whether the potential impact pathways to any European Site (and its qualifying features) from the Project can be excluded
- If not, whether an adverse effect on the integrity of the European Site (in view of the sites' conservation objectives) from the Project (either alone or in combination with other plans or projects) can be ruled out.

1.3.3 This report has been prepared in accordance with the Planning Inspectorate's Advice Page (Planning Inspectorate, 2025). It draws on survey data and desk study data as evidence to support the assessment. A summary of the bird surveys completed, and desk study assessments is provided in Appendix A: Bird Surveys and Desk Study Work.

1.4 Engagement and Consultation

1.4.1 Table 1.1 outlines relevant engagement and consultation undertaken to date with Natural England. All outcomes from the engagement and consultation have been used to design survey methods and analyse results.

Table 1.1 Summary of relevant engagement and consultation

Date	Details
July 2022	**Organisation:** Natural England **Topic / Receptor:** Wintering and Passage Bird Survey Scope – July 2022 A bird survey scope document was shared with Natural England that outlined a scope for obtaining wintering / passage bird data to inform both the Ecological Impact Assessment and the HRA. Criteria were set out for determining locations for vantage point (VP) and transect surveys in habitat that could be considered Functionally Linked Land (FLL) as it was suitable to support qualifying features (birds) associated with the European Sites. The document proposed that VP surveys would be undertaken within the 'Scoping Report Corridor' along pre-identified 'green corridors', containing a main river or a network of waterways and / or waterbodies. It also outlined transects would be undertaken within the Order Limits where at least one of the following applied: 1. Situated within a core 3 km Impact Risk Zone (IRZ) for the Stour and Orwell Estuaries, 2. Situated within a 500 m buffer around the River Stour and/or 3. Situated within the IRZ for the Thames Estuary and Marshes. **Outcome/Action:** The bird survey scope document was reviewed by Natural England. At the time Natural England were unable to provide a bespoke response or agreement; a meeting was requested and held in August 2022.

Date	Details
August 2022	**Organisation:** Natural England **Topic / Receptor:** Wintering and Passage Bird Survey Scope – July 2022 As above. **Outcome/Action:** Presentation and discussion via Microsoft Teams. Key points discussed and agreed to include within the bird survey scope document. • The 3 to 5 km IRZ is relevant to the qualifying species that are part of the *Charadriidae* family (plovers[3], dotterel and lapwing) and should be considered as part of the survey work (the IRZ was only considered up to 3 km). • Existing data sources should be checked for records of brent goose up to 5 km from the Stour and Orwell Estuary SPA. • Recommended two surveys per month in the non-breeding season (only one was planned in September and March). • One survey season to be surveyed as an absolute minimum; two seasons of data is expected where a high risk of impact to European Sites is identified. Use of FLL depends on cropping regime which should be considered as part of the assessment.
September 2022	**Organisation:** Natural England **Topic / Receptor:** Wintering and Passage Bird Survey Scope – September 2022 The bird survey scope document was updated to reflect changes agreed in August 2022. **Outcome/Action: Natural England agreed** their advice had been taken on board and the methodology within the bird survey scope document was incorporated into ES Appendix 8.8: Wintering and Passage Bird Report (document reference 6.8.A8).
June 2023	**Organisation:** Environment Agency **Topic / Receptor:** Zone of Influence (ZoI) for the Water Framework Directive Regulations Assessment **Outcome/Action:** The **Environment Agency agreed** that the proposed ZoI would encompass surface and groundwater bodies situated within 500 m of the draft Order Limits. In addition, protected areas with a surface or groundwater dependency within 500 m of the draft Order Limits would also be included in the scope of the assessment.
September 2023	**Organisation:** Natural England **Topic / Receptor:** Response to Habitats Regulations Assessment scoping document **Outcome/Action:**

[3] The Listed Species within the citations are not always exhaustive and during consultation with Natural England, golden plover was a species for which concern was raised, even though it is not a Qualifying or Listed Species on the SPA or Ramsar Site citations. Golden Plover is a species associated with the SPA / Ramsar Site habitats, it is a species that travels large distances (more than 5 km) between feeding and roosting sites, often found on large arable fields. It is listed as a 'non-qualifying' species on the Thames Estuary and Marshes SPA. Therefore, although not present in qualifying feature numbers, the golden plover was included for the HRA screening.

Date	Details
	A Habitats Regulations Assessment scoping document was shared with Natural England in August 2023. **Natural England agreed** a number of European Sites could be 'screened out' at then pre-screening stage providing no LSEs could be evidenced. **Natural England also agreed** the following sites and ZoIs should be subject to detailed screening: <u>Protected Sites</u> Norfolk Valley Fens SAC, the Stour and Orwell Estuaries SPA / Ramsar Site and the Thames Estuary and Marshes SPA / Ramsar Site. The following ZoIs were agreed: • 200 m from the Project or affected road network for assessing changes in air quality from fugitive dust and vehicle emissions during construction. • 500 m for changes in noise/vibration and visual disturbance and 0.5 lux as a threshold for the impact of artificial lighting. Norfolk Valley Fens SAC It was **agreed** that the likely impact pathways required to be considered further were changes to air quality, groundwater hydrology and surface water and quantity during construction. [Note: During Stage 1 – Screening, air quality was 'screened out' as changes to the Order Limits resulted in the Norfolk Valley Fens SAC being outside the ZoI for air quality] Stour and Orwell Estuaries SPA / Ramsar Site Based on the results of the wintering / passage bird surveys undertaken in 2022/2023 where low numbers of qualifying features (birds) were recorded it was **agreed** that one non-breeding season of survey data in conjunction with a details desk-based study was sufficient and robust to inform the assessment. It was also **agreed** that targeted surveys were not required for breeding avocet as there were no impact pathways. **Thames Estuary and Marshes SPA / Ramsar Site** It was **agreed** that a bespoke survey effort in line with previously agreed methodology was required for this area and the assessment could not rely on existing data from previous Nationally Significant Infrastructure Projects (NSIPs) alone.
September / October 2024	**Organisation:** Natural England **Topic / Receptor:** Natural England's response to the Draft HRA Screening Report **Outcome/Action:** A range of points were discussed. *[Note: feedback was based on the Project design as presented at statutory consultation in the summer of 2024, and desk study bird records which did not correspond with the full SPA / Ramsar Site boundary (flagged as a limitation by Natural England). The conclusions in the response were made at that time and since then the Order Limits and Project design has evolved. Feedback is included for completeness as following statutory consultation, the Order Limits were located further away from the Thames Estuary and Marshes SPA / Ramsar Site – refer to Natural England's feedback received in February 2025 for their latest position – Letter in Appendix B].* Stour and Orwell Estuaries SPA / Ramsar Site

Date	Details
	FLL – **Natural England agreed** that LSEs on all species other than golden plover and lapwing (part of the waterbird assemblage qualifying feature) could be screened out. As both these species were recorded in significant numbers (>1% of the SPA five-year mean peak WeBS count[4]), LSEs on these species were taken to the Appropriate Assessment stage. This also included effects associated with disturbance during construction. **Natural England agreed** a desk-based assessment could be used to determine the availability of alternative habitat in the surrounding area if birds were disturbed on FLL and confirmed further bird surveys of surrounding land was not required to demonstrate use by these species. Collision Risk – **Natural England agreed** survey results show collision risk is low and there would be no LSE. **Thames Estuary and Marshes SPA / Ramsar Site** FLL – **Natural England agreed** the Order Limits do not support significant numbers of SPA / Ramsar Site birds with the exception of lapwing. As LSEs could not be ruled out for lapwing, it was agreed that this would be progressed to the Appropriate Assessment stage. [*Note: because of a change in location of Order Limits away from the Thames Estuary and Marshes SPA this protected site was later screened out from further assessment*]. Disturbance – Natural England noted survey results show the mudflats along the Thames (outside the Order Limits) are an important area for SPA / Ramsar Site birds. **Natural England agreed** the existing seawall would likely reduce visual disturbance, but noise contour mapping would help to determine LSEs. *[Note: noise contour mapping was not undertaken as the IRZ for the Thames Estuary and Marshes SPA / Ramsar Site no longer fell within the Order Limits following statutory consultation.]* Collision Risk – Natural England assumed LSEs could be screened out for collision risk due to underground cabling proposed within the vicinity of the SPA / Ramsar Site; however, Natural England agreed that this would need to be explained within the HRA Report. Following statutory consultation, the extent of proposed underground cabling was reduced at Tilbury, but collision risk is considered in Table 2.6 and Table 2.7 of Section 2: Stage 1 – Screening.
February 2025	**Organisation:** Natural England **Topic / Receptor:** Response to a revised HRA Draft Screening Report which had been submitted to Natural England for review following statutory consultation. Natural England had expressed concern over potential FLL within the September / October 2024 consultation, advising LSEs with regard to lapwing and golden plover (part of the waterbird assemblage qualifying feature of the Stour and Orwell Estuaries SPA / Ramsar Site) should be progressed to Appropriate Assessment. Therefore a meeting was held, and a presentation given to discuss potential mitigation. **Outcome/Action:** **Stour and Orwell Estuaries SPA / Ramsar Site** In the meeting National Grid presented alternative habitat available to lapwing and golden plover within 5 km of the Stour and Orwell Estuaries SPA / Ramsar Site. It was **agreed with Natural England** that there is sufficient alternative habitat within

[4] The Wetland Bird Survey (WeBS) is a monitoring scheme for non-breeding waterbirds in the United Kingdom. It provides monthly count data at a large number of wetland sites.

Date	Details
	the area to support lapwing and golden plover (the two species associated with the FLL) during the construction period (habitats within the Order Limits would be returned to agriculture once the Project is operational) and therefore the integrity of the SPA / Ramsar Site would not be adversely affected and no further mitigation is needed. This **agreement** is documented in a letter from Natural England within Appendix B: Consultation Documents. **Thames Estuary and Marshes SPA / Ramsar Site** The design of the Project in Tilbury has changed since the statutory consultation, with the Order Limits reduced and located further from the Thames Estuary and Marshes SPA / Ramsar Site. In addition, following Natural England's advice, desk study data was purchased to determine if significant numbers of SPA / Ramsar site birds were using land within the Order Limits. Following a review of survey data against the Project, it was concluded the design avoids all potential impact pathways to the Thames Estuary and Marshes SPA / Ramsar Site. Therefore, there would be no LSEs and this European Site could be screened out. **Natural England agreed** with this and this **agreement** is documented in a letter within Appendix B: Consultation Documents.
July 2025	**Organisation:** Natural England **Topic / Receptor:** Final Draft HRA **Outcome/Action:** A draft of this HRA Report was shared with Natural England at the time of submission and final minor comments received have been addressed within this report. Additional bird survey result plans, as presented in the consultation meeting, have been provided at Appendix C showing the low numbers of birds identified during surveys a significant distance from the relevant SPA's. A commitment to the production of a 'Trenchless Crossing Method Statement and Contingency Plan' for the River Stour has also been captured within this report as requested by Natural England in the latest feedback. This commitment has also been included within the Code of Construction Practice (CoCP) (document reference 7.2) and secured via Requirement 4 of the DCO. Natural England concurs that the sites identified and taken forward to the screening stage are considered appropriate and exhaustive. Natural England is now content that the construction and operational stages of Norwich to Tilbury can be carried out without impacting on SPA species using functionally linked land. Natural England considers that both the projects identified and the conclusions drawn are appropriate.

1.5 Nomenclature

1.5.1 Common names of bird species follow English naming conventions in the British Ornithological Union British List (British Ornithologists Union, 2022). Scientific names are listed in ES Appendix 8.8: Wintering and Passage Bird Report (document reference 6.8.A8), in line with Natural History Museum Species dictionary (Natural History Museum, 2025).

2. Stage 1 – HRA Screening

2.1 HRA Screening Steps

2.1.1 The purpose of HRA Screening is to determine if a Project could have LSEs on a European Site during construction or operation (and maintenance)[5] on its own or in combination with other proposals.

2.1.2 This report follows the screening procedures outlined by the Natural England Standard: Habitats Regulations Assessment (HRA) (Natural England, 2019) as well as the Planning Inspectorate's Advice Page (Planning Inspectorate, 2025). The steps included are:

- Step 1: Determining whether the plan / project is directly connected with or necessary for the management of the site

  Proceed to Step 2 if the answer is no

- Step 2: Describing the plan / project

  Set out a clear description of the proposals for the Project, which must include location, timing, scale and methods

- Step 3: Identifying the potential effects on European Site

  All possible direct, indirect, and cumulative effects on the qualifying features of the site must be considered

- Step 4: Assessing the significance of any effects on European Sites

  It must be determined whether the effects are likely to be significant, either alone or in combination with other plans or projects. Where significant effects cannot be rules out, an Appropriate Assessment is required.

2.2 Step 1 – Determining Whether the Project is Directly Connected with or Necessary for the Management of the Site

2.2.1 The first step of the screening process is to identify whether the Project is related to the conservation management of European Sites in accordance with Regulation 63 of the Habitats Regulations.

2.2.2 In accordance with the European Commission (2002) guidance, for a project to be 'directly' connected with, or necessary for, the management of a European Site, the management must refer to measures that are for conservation purposes, with the 'directly' element referring to measures that are solely conceived for the conservation management of a site and not direct or indirect consequences of other activities.

[5] Note: Decommissioning does not from part of the Project.

2.2.3 **The Project is a 'project' for the purpose of the Habitats Regulations and not directly connected with, or necessary for, the management of any European Site.**

2.3 Step 2 – Description of the Project

2.3.1 The Project is a proposal by National Grid to upgrade the electricity transmission system in East Anglia between Norwich and Tilbury, comprising:

- A new 400 kilovolt (kV) electricity transmission connection of approximately 180 km overall length from Norwich Main Substation to Tilbury Substation via Bramford Substation, a new East Anglia Connection Node (EACN) Substation and a new Tilbury North Substation, including:
  - Approximately 159 km of new overhead line supported on approximately 509 pylons, either standard steel lattice pylons (approximately 50 m in height) or low height steel lattice pylons (approximately 40 m in height) and some of which would be gantries (typically up to 15 m in height) within proposed Cable Sealing End (CSE) compounds or existing or proposed substations
  - Approximately 21 km of 400 kV underground cabling, some of which would be located through the Dedham Vale National Landscape (an Area of Outstanding Natural Beauty (AONB[6])
- Up to seven new CSE compounds (with permanent access) to connect the overhead lines to the underground cables
- Modification works to connect into the existing Norwich Main Substation and a substation extension at the existing Bramford Substation
- A new 400 kV substation on the Tendring Peninsula, referred to as the EACN Substation (with a new permanent access). This is proposed to be an Air Insulated Switchgear (AIS) substation
- A new 400 kV substation to the south of Orsett Golf Course in Essex, referred to as the Tilbury North Substation (with a new permanent access). This is proposed to be a Gas Insulated Switchgear (GIS) substation
- Modifications to the existing National Grid Electricity Transmission overhead lines to facilitate the connection of the existing network into the new Tilbury North Substation to provide connection to the Tilbury Substation
- Ancillary and/or temporary works associated with the construction of the Project.

2.3.2 In addition, third party utilities diversions and/or modifications would be required to facilitate the construction of the Project. There would also be land required for environmental mitigation and Biodiversity Net Gain (BNG).

2.3.3 As well as the permanent infrastructure, land would also be required temporarily for construction activities including, for example, working areas for construction equipment and machinery, site offices, welfare, storage and temporary construction access.

[6] National Landscape is the rebranded name of an Area of Outstanding Natural Beauty (AONB) from 22 November 2023

2.3.4 ES Figure 4.1: Proposed Project Design (document reference 6.4.F1) presents details of the Project. ES Figure 4.2: Proposed Project Design – Permanent Features (document reference 6.4.F2) presents only the permanent features of the Project including permanent access routes associated with other elements of the work (e.g. to specific pylon locations, or to the underground cable). There would be no physical works associated with these permanent access routes to pylons or underground cables. They are proposed rights of access only to allow for any maintenance or refurbishment required.

2.3.5 In addition, the Works Plans (document reference 2.3) provide tables of parameters relevant to each permanent element of the Project.

2.3.6 The Project has also been sub-divided into eight geographical sections for reader accessibility, based largely on Local Planning Authority boundaries. These are shown on Figures 1 and 2 in Appendix C: Figures and comprise:

- Section A – South Norfolk Council
- Section B – Mid-Suffolk District Council
- Section C – Babergh District Council, Colchester City Council and Tendring District Council
- Section D – Colchester City Council
- Section E – Braintree District Council
- Section F – Chelmsford City Council and Brentwood Borough Council
- Section G – Basildon Borough Council and Brentwood Borough Council (and part of Chelmsford City Council)
- Section H – Thurrock Council.

Order Limits and Limits of Deviation

2.3.7 The Order Limits are defined as the maximum extent of land within which the Project, may be carried out, and includes both permanent and temporary land required to build and operate (and maintain) the Project.

2.3.8 The Order Limits include Limits of Deviation (LoD) which represent the maximum deviation for permanent features, such as the overhead line, pylons, CSE compounds, new substations and underground cables. This allows for adjustment to the final positioning of Project features to avoid localised constraints or unknown or unforeseeable issues that may arise.

2.3.9 The assessment presented within this document is based on the design and LoD as shown on the Works Plans (document reference 2.3), ES Figure 4.1: Proposed Project Design (document reference 6.4.F1) and ES Figure 4.2: Proposed Project Design – Permanent Features (document reference 6.4.F2). However, it should be noted that the permanent aspects of the Project, including pylon locations, are not fixed and could be located anywhere within the LoD, as defined on the Works Plans (document reference 2.3) (unless a commitment has been made to restrict the LoD, details of which are outlined within the Outline CoCP (document reference 7.2)). The location and orientation of the CSE compounds, new EACN Substation, new Tilbury North Substation and underground cables may also change within the LoD. In this case the associated temporary construction works would also change to the revised locations, albeit within the Order Limits. Table 2.1 provides details of the Projects LoD.

Table 2.1 Details of Order Limits and LoD

Project Component	Details
Proposed overhead line	
Order Limits and vertical, lateral and longitudinal LoD	The Order Limits are generally 100 m wide, i.e. 50 m either side of the centre line of the proposed overhead line. The vertical LoD would be to any extent not exceeding 6 m upwards from the pylon design heights presented within the Works Plans (document reference 2.3) to allow for variations in heights between pylons to allow extra height to clear existing features, maintaining electrical clearance to the ground. The lateral LoD of 50 m either side of centreline and the longitudinal LoD[7] allows flexibility to move pylon positions in any direction for unforeseen circumstances, such as poor ground conditions or archaeological finds, and to cater for maximum conductor (overhead line) swing. Commitments to restrict the LoD for specific pylon locations are included within the Outline CoCP (document reference 7.2).
Proposed new substations and modifications to existing substations	
Order Limits and vertical, lateral and longitudinal LoD	The Order Limits include approximately 640 m x 740 m for the new EACN Substation (including spacing for the associated Environmental Area)[8]; approximately 340 m x 530 m for the new Tilbury North Substation[9]; and approximately 300 m x 600 m for the extension works needed at Bramford Substation (including the footprint of the existing substation). There is no defined vertical (downwards) LoD for the works to substations. The vertical (upwards) LoD could be up to 10% higher than shown on the layout and elevation plans (document reference 2.6) excluding aerials, handrails, rooftop equipment and lightning protection. The lateral and longitudinal LoD for the substation works are as shown on the Works Plans (document reference 2.3), including space for the substations, drainage, accesses, construction compounds and soil storage.

[7] Longitudinal LoD means movement along the line of the Project

[8] The operational footprint of the new EACN Substation is proposed to be approximately 550 m x 230 m; further detail is within Section 4.9.

[9] The operational footprint of the new Tilbury North Substation is proposed to be approximately 340 m x 300 m; further detail is within Section 4.9.

Project Component	Details
Proposed CSE compounds	
Order Limits and vertical, lateral and longitudinal LoD	The Order Limits include approximately 64 m x 90 m for the CSE compounds, plus the LoD as defined below. There is no defined vertical (downwards) LoD for the works to CSE compounds. The vertical (upwards) LoD could be up to 10% higher than shown on the layout and elevation plans (document reference 2.6). The lateral and longitudinal LoD are generally 50 m on all sides of the proposed location but vary locally depending on existing features (e.g. hedgerows, watercourses).
Proposed underground cables	
Order Limits and vertical and lateral LoD	The Order Limits are generally 220 m wide. In some instances, the Order Limits have been widened to, for example, accommodate mitigation for protected species should it be required at the time of construction. There is no defined vertical LoD as the extent would be as necessary or convenient, however the minimum depth between the top of the protective tiles and made ground level would be approximately 0.9 m (where not within a substation or CSE compound). Lateral LoD of 100 m (50 m either side of the approximately 120 m cable construction swathe).
Removal of existing and proposed 132 kV overhead lines	
Order Limits and vertical and lateral LoD	The Order Limits are generally 35 m wide for the underground cable installation (replacing the overhead line being removed) to allow for lateral LoD. The LoD and Order Limits for the 132 kV works as shown on the Works Plans (document reference 2.3) include space for temporary overhead line diversions, the underground cable alignment and the existing alignment.
Removal of existing 33 kV and 11 kV overhead lines	
Order Limits and lateral LoD	The Order Limits are generally 25 m wide for the underground cable installation to allow for lateral LoD. The LoD and Order Limits for the 11 kV and 33 kV works as shown on the Works Plans (document reference 2.3) allow for dismantling and diversion of wood pole electricity and communications overhead lines needed to facilitate the Project.

Construction Programme

2.3.10 Prior to the grant of DCO consent, a number of pre-construction environmental surveys would be undertaken in 2026.

2.3.11 Should consent be granted, it is anticipated that construction of the Project would commence in 2027 and continue for four years through to 2031 (including demobilisation). Certain pre-commencement operations could take place following the grant of DCO consent and in advance of construction, including:

- Engineering investigations and surveys
- Environmental (including archaeological) investigations and monitoring
- Surveys and monitoring investigations associated with assessing ground conditions
- Diversion and laying of services, protection works comprising utilities protection works or fencing and protection slabs
- Site clearance
- Environmental mitigation measures
- Remediation associated with contamination or other adverse ground conditions
- Site set up works associated with the establishment of construction compounds and temporary laydown areas
- Temporary accesses
- Erection of temporary enclosures or temporary demarcation fencing marking out site boundaries and the temporary display of site notices or advertisements.

Construction Working Hours

2.3.12 It is assumed that the core working hours for construction (as set out within Requirement 6 of the draft DCO (document reference 3.1)) would be:

- Monday to Friday: 07:00 –19:00
- Saturdays, Sundays, Bank Holidays and other public holidays: 07:00 – 17:00.

2.3.13 No percussive piling works would take place outside of the hours of 07:00 – 19:00 Monday to Friday and 07:00 to 17:00 on Saturdays.

2.3.14 Unless otherwise agreed with the local highway authority, no Heavy Good Vehicle (HGV) deliveries would be made to site outside of the hours of 07:00 to 19:00 Monday to Friday and 07:00 to 17:00 on Saturdays.

2.3.15 The following operations may take place outside the core working hours:

- Trenchless crossing operations including at landfalls and beneath highways, railway lines, woodlands, nature reserves, Sites of Special Scientific Interest or watercourses
- The installation and removal of conductors, pilot wires and associated protective netting (included but not limited to) across highways, railway lines or watercourses

- The jointing of underground cables
- The continuation of any work activity commenced during the core working hours to a point where they can securely and or safely be paused
- Any highway works requested by the highway authority to be undertaken on a Saturday or Sunday or outside the core working hours
- The testing or commissioning of any electrical plant installed as part of the authorised development including undertaking of any identified corrective activities
- The completion of works delayed or held up by severe weather conditions which disrupted or interrupted normal construction activities
- Activity necessary in the instance of an emergency where there is a risk to persons or property
- Security monitoring
- Non-intrusive surveys
- Intrusive surveys
- Oil processing of transformers or reactors in substation sites
- Delivery to the transmission works of abnormal indivisible loads and any highway works requested by the highway authority to be undertaken outside the core working hours
- Mechanical and electrical installation works within buildings once erected and enclosed.

2.3.16 The core working hours exclude:

- Start up and close down activities up to 1 hour either side of the core working hours.

2.3.17 The severe weather conditions referred to means any weather which prevents work from taking place during the core working hours by reason of physical incapacity (whether for reasons of visibility, ground conditions, power availability, site access or otherwise) or being contrary to safe working practices.

Night Working

2.3.18 There is no intention for night working on the Project as standard. However, there would be occasions where night working is required, as set out in the operations that may take place outside of the core working hours above. There is also the potential for the trenchless crossing works to be undertaken at night. Parts of the trenchless crossing operations require continuous working to achieve completion of the crossing. Some road works may also need to be undertaken at night to reduce effects on local traffic.

Construction Workforce and Vehicles

Estimated Workforce

2.3.19 National Grid has estimated the number of construction workers that it would require on the Project and how these would be spread across the construction programme.

2.3.20 Over the four-year construction phase, there would be a maximum peak day where approximately 1,720 Full Time Equivalent (FTE)10 employees would be working on the Project. Employees would be spread across various work sites along the 180 km Project. In addition to the above, the Project would generate approximately 4,800 FTE gross direct employees across the whole four-year construction phase.

2.3.21 The majority of employment activities would require trained specialists who are qualified to work on National Grid infrastructure, and it is assumed that these would be sourced from an existing pool of approved contractors. However, experience of other National Grid projects suggests that it is likely that a minimum of 10% of the workers could be sourced from the local labour market, including apprentices, security workers and delivery drivers.

Estimated Construction Vehicles

2.3.22 National Grid has estimated the flows / volumes of construction vehicles that it anticipates would be required to construct the Project. These estimates are provided in ES Appendix 16.4: Traffic and Transport Construction Effects (document reference 6.16.A4). They are based on a reasonable worst-case.

Existing Features During Construction

2.3.23 The paragraphs that follow outline assumptions relating to existing features during construction.

Land Drainage

2.3.24 Where appropriate, pre-construction field drainage would be installed in working areas to:

- Help prevent possible waterlogging of working areas and therefore the need for temporary dewatering during construction
- Enable the landowner's current drainage system to continue working throughout construction
- Help prevent damage to the soil structure
- Aid recovery from construction activities
- Help prevent any future drainage problems.

2.3.25 Landowners would be consulted on the design of the land drainage proposals. The design would reduce risk so that the drains do not act as pathways for contamination or cause flooding off site. The Lead Local Flood Authorities (LLFAs) and Internal Drainage Boards (IDBs) would also be consulted on drainage design where necessary. Following construction, the land would be reinstated to its former

[10] FTE measures the total number of hours worked by employees in relation to a full-time work schedule.

condition (unless otherwise agreed) including installation of a replacement drainage scheme where appropriate.

2.3.26 A specialised drainage contractor(s) would review the drainage designs and provide advice to National Grid and the Main Works Contractor(s) during all relevant construction and reinstatement activities. Permanent records of the land drainage locations would be made and passed to the landowners/occupiers.

2.3.27 The Outline CoCP (document reference 7.2) describes a number of commitments linked to sustaining existing land drainage infrastructure which is secured by Requirement 4 of the draft DCO (document reference 3.1).

Public Rights of Way

2.3.28 A number of PRoWs would be affected by the construction of the Project; the existing PRoWs intersecting the Project are shown on ES Figure 15.3: Recreational Land and Recreational Routes (document reference 6.15.F3). Discussions with PRoW officers have been held to discuss the management of PRoWs, including managing, diverting and / or temporarily closing PRoWs. Management of PRoW during construction is detailed within the Outline PRoW Management Plan (document reference 7.6) and shown on the Access, Rights of Way and Public Rights of Navigation Plans (document reference 2.5).

Water Usage, Abstractions, Discharges and Dewatering

2.3.29 It is currently assumed that no discharges (other than treated and restricted surface water runoff) to surface waters are required for the Project during construction. It is also assumed that there would be no new temporary or permanent abstractions and that the water supply needs of the Project during construction would be sourced from mains water supply, or in remote locations where mains water may not be available, water would be tankered in. With regard to grey water generated from welfare facilities, it is assumed that this would be discharged to the public sewer or, where this is not practicable, be collected and tankered off site to a licensed disposal facility.

2.3.30 Where excavation of soil is required, for example at the base of the pylons and for the cable trenches, and where water is encountered in the excavation, it would be pumped out using an appropriate pump and a sump made in the subsoil using the excavator. The water would be pumped from the sump and allowed to filter through silt traps. The assessment presented within this HRA Report assumes that there may be the need for temporary short-term dewatering, such as removal of rainwater or surface water when undertaking soil excavation. It is anticipated these would be local discharges to ground (after using settlement tanks) and not to watercourses. Removing rainwater from excavations does not require a permit.

2.3.31 It is assumed that no temporary discharges to watercourses are required for dewatering. Where this is not practicable in localised areas, any discharge to surface water would be undertaken in accordance with relevant consents.

2.3.32 Dewatering is assumed where there is an intersection with the water table (and active lowering of the water table) for 100 days or more and therefore could require a permit. Permits relating to temporary dewatering (abstraction) may be required at the trenchless crossings. If the abstracted groundwater is discharged immediately to a soakaway, the abstraction would be exempt from an abstraction licence. If the water is not immediately discharged to a soakaway, it would be exempt when the abstraction is:

- Less than 100 m^3 per day and located more than 500 m from a designated site or 250 m from a spring, well or borehole, or
- Less than 50 m^3 per day and located less than 500 m from a designated site or 250 m from a spring, well or borehole.

2.3.33 In all other cases, a licence would be required. Once the discharge duration, volume and water quality have been assessed, a decision would be made, in conjunction with the Environment Agency, as to whether an abstraction licence and / or discharge permit is required.

2.3.34 The discharge would be exempt from a discharge permit if it is a groundwater discharge where the water quality meets the Drinking Water Standards and is of less than 30 days duration (Environment Agency, 2021). It would also be exempt if it is a surface water discharge of clean water, without suspended solids, and is for a duration of less than three months.

2.3.35 Drainage outfalls are identified on ES Figure 4.1: Proposed Project Design (document reference 6.4.F1) and in ES Appendix 4.2: Watercourse Crossing Details (document reference 6.4.A2).

Assumptions on Materials and Waste During Construction

Materials During Construction

2.3.36 The nature of the Project means that it is not practicable to use secondary sources during construction, as this can affect the operation and the design life of the Project. However, National Grid has existing processes in place to source materials from sustainable sources and to use recycled materials where these do not compromise the required design standards and operational life, where practicable.

2.3.37 The material sources are unlikely to be identified until the detailed design and procurement stage of the Project, which would happen post-consent.

2.3.38 Although materials would be resourced from within the region where practicable, it is recognised that certain temporary materials, such as hardcore for the haul road and temporary construction compounds, may need to be resourced from outside the region. Further detail can be found within Transport Assessment (document reference 7.11).

2.3.39 Where practicable, this material would be reused at other construction projects after completion of the Project. Opportunities to retain materials in situ, where specifically requested by landowners, would also be considered subject to any additional permission being obtained by the landowner. Other construction items such as works cabins and security fencing would be sourced from within the region (where practicable).

Waste During Construction

2.3.40 Waste materials would be produced during construction. The Overarching NPS for Energy (EN-1) (Paragraphs 5.15.2 and 5.15.3) (DESNZ, 2024a) states that the waste hierarchy must be applied when managing waste and disposal of waste should only be considered where other waste management options are not available.

2.3.41 It is assumed that any soil excavated from the Project (e.g., displaced from the cable ducts or pylon foundations) would be reused on site where soil is suitable for reuse

(for example, not contaminated and giving consideration to land holdings and applicable biosecurity measures). This could be through the backfilling of foundations removed from 132 kV overhead line removal, the cable trenches and for landscaping. It is assumed that all soil could be reused on site; however, if it arises that excess soil cannot be reused on site, this soil would be taken off site.

2.3.42 The Main Works Contractor(s) would produce a Site Waste Management Plan (SWMP) prior to construction (an Outline SWMP is provided as an appendix to the Outline CoCP (document reference 7.2)). The Outline SWMP provides a framework to reduce the generation of waste in the first place and appropriate measures to reuse and recycle materials where practicable. The SWMP would identify appropriate waste facilities to dispose of materials.

2.4 Project Description – Construction – Temporary and Permanent Features

Temporary Construction Compounds

2.4.1 There would be an element of preparatory works/pre-commencement works/enabling works in anticipation of construction at all temporary construction sites. The working areas would be demarcated and secured by temporary fencing appropriate to the location, for example provision of stockproof fencing in grazing areas. Gated entrances would be installed at the entrance to the working areas, to secure the site. Once secured, the working area, temporary construction compounds and proposed cable sections would generally be stripped of the upper layers of soil which would be stored appropriately within the Order Limits.

2.4.2 Temporary construction compounds would be established early in the construction programme. Site cabins (standard modular units) would be up to double storey and may be raised to take account of potential flood risk.

2.4.3 The sustainability of temporary construction compounds has been optimised, for example locating them close to Primary Access Routes[11], close to the core works they are supporting and where practicable away from residential receptors. The temporary construction compounds are likely to include grey water harvesting for toilet flushing, solar power on site, electric charging for plant and vehicles etc. National Grid requires an internal Sustainability Action Plan (which would be a live document driven by internal requirements) to be prepared for all of its construction projects; this plan would provide further sustainability commitments the Main Works Contractor(s) would be required to adhere to, for example providing Electric Vehicle charging and procuring energy efficient site cabins.

2.4.4 The following types of temporary construction compounds are proposed to facilitate construction of the Project:

- Main Works compounds (overhead line) (two proposed): These would act as the key focal points for deliveries, materials storage, fuel storage, office space, meeting facilities, welfare facilities and power generator(s) for the Project delivery teams. Main Works compounds would be approximately 275 m x 200 m. They would be typically surfaced with stone chippings over geogrid

[11] Roads on the local road network that would be used by construction vehicles between the strategic road network and the access points within the Order Limits to access the Project.

- Satellite compounds (overhead line) (five proposed): These would be positioned at strategic locations along the alignment. They would be smaller than the Main Works compounds, approximately 130 m x 110 m and would serve as specific working areas to provide local welfare facilities for staff and points for delivery of materials to the working areas. They would be typically surfaced with stone chippings over geogrid
- Primary compounds (underground cable) (three proposed): These would provide storage for approximately 54 cable drums, and have approximate dimensions of 155 m x 155 m. These would allow for deliveries, materials storage, fuel storage, office space, meeting facilities, welfare facilities and crane platforms typically for unloading cable drums. They would be typically surfaced with stone chippings over geogrid. An additional six secondary construction compounds are proposed along the cable alignment which would be similar to the primary compounds but smaller to reflect the available space and Project needs at the specific location
- Substation/ CSE compounds (10 proposed): These would be appropriately positioned at substation and CSE locations. These would be similar in size and arrangement to those used for the cable works, with the cable drum storage being replaced with additional lay down area
- Concrete batching plant compounds (four proposed): These would provide a location for temporary concrete batching equipment, with approximate dimensions of 62 m x 90 m. These would allow for assembly of the batching equipment, topsoil storage, aggregate storage (for concrete mixing) and HGV access around the equipment. Batching equipment would typically be 10 m in height. The batching plants would provide Cement-Bound Sand (CBS) for backfill of the cable trench and concrete for substation and CSE compound works. These compounds would be located at strategic positions, based on anticipated concrete / CBS demand. They would be typically surfaced with stone chippings over geogrid
- 132 kV overhead line mitigation works UKPN compounds (17 proposed): These would be appropriately positioned within the working area for the 132 kV mitigation works and approximately 40 m x 40 m in size located at each end of the proposed works. They would be typically surfaced with trackway
- Highway mitigation compounds (13 proposed): These are required to facilitate the construction of the highway mitigation works, for example road widening and passing places. They would generally include welfare facilities, traffic management equipment, vehicle parking and material storage. They would be typically surfaced with stone chippings over geogrid.

2.4.5 The locations of temporary construction compounds are identified on ES Figure 4.1: Proposed Project Design (document reference 6.4.F1). General Layout Drawings for each of the temporary construction compound types are provided in the Design and Layout Plans (document reference 2.6).

2.4.6 In addition to the above, a number of temporary construction laydown areas would also be required. These would be predominantly located at the site access points (or bellmouths) where the PARs meet the Order Limits and are presented on ES Figure 4.1: Proposed Project Design (document reference 6.4.F1).

2.4.7 The construction laydown areas would store stone and other materials to facilitate the construction of the Project (predominantly for the haul roads). Material storage would typically only be needed for the first 12 months of construction and would likely store material to a maximum of 4 m in height at any one time.

2.4.8 Construction laydown areas have been selected to avoid sensitive environmental features. It is assumed that they would generally be stripped of topsoil which would be stored appropriately and typically surfaced with stone chippings over geogrid. They would be reinstated to their former condition following their use.

2.4.9 As well as the temporary construction compounds outlined above, site staff welfare units (including portaloos or similar) would also be required along the Project at strategically placed locations, to allow construction staff to have access to welfare facilities.

2.4.10 In addition, materials may be temporarily placed adjacent to any temporary construction areas during construction for example pylon components before being erected.

Non-Road Mobile Machinery (NRMM) and Use

2.4.11 All temporary construction compounds and trenchless crossing locations would require the use of generators. UKPN connections may be available to supply electricity to the temporary construction compounds. UKPN connections would be made where practicable within the Order Limits. However, any UKPN connections remain subject to agreement and cannot be guaranteed. Therefore, as a worst-case it is assumed that generators would be present at all temporary construction compounds.

Temporary Construction Access and Haul Road

Access Strategy

2.4.12 Construction traffic would use the Strategic Road Network (SRN)12 and Major Road Network (MRN)13 to access the Project. From the MRN and SRN, construction traffic would be routed along a PAR to a site access point (or bellmouth). From these site access points; traffic would be routed off the public highway along the haul road to access the construction works.

2.4.13 Crossover points would also be provided where the haul road meet and cross the public highway and private tracks i.e., a bellmouth would be provided either side of the public highway / private track to allow construction traffic to safely cross. In some instances, crossover points are also site access points.

2.4.14 A number of PARs have been identified to access the haul road, with additional PARs proposed for longer sections of continuous haul road where appropriate. Generally, PARs are proposed to access each end of a haul road section, allowing construction traffic to enter the haul road at one end, travel along the haul road and exit the other end (if required). Dead-end haul roads have been avoided as far as practicable. However, there are some instances where part of the haul road can only be accessed from one PAR due to site specific constraints.

2.4.15 There may be circumstances where traffic movements along the haul road, or on the SRN / MRN and / or Local Road Network (LRN)14 are compromised, which may

[12] Major roads and motorways critical to long-distance travel, economic activity and connectivity between regions

[13] Regionally important roads, such as key A-roads connecting areas to the SRN

[14] Locally important roads primarily connecting local areas

affect construction vehicles using agreed PARs and site access points. In the event of any incident occurring which affects the safe and efficient operation of the road network, additional mitigation measures may be needed. Further detail is provided in the Outline Construction Traffic Management Plan (CTMP) (document reference 7.3).

2.4.16 Site access points and crossover points have been sited based on site specific constraints and highway safety considerations. The locations of the site access points on the public highway are generally close to the underground cabling and overhead line construction corridors. The most suitable location for the proposed site access points have been determined with consideration of road geometry, increasing junction visibility and other site-specific constraints. Locations have, where appropriate, been chosen to reduce the effects on trees and hedgerows. Existing land / field accesses have been used where they are considered to be suitable locations as determined by the above assessment criteria. When forming site access points, connectivity for NMUs would be preserved, where safe and practicable.

2.4.17 The site access point layouts are designed to allow for two-way HGV movements. A standard detail showing the typical layout of the site access points, including the junction layout and visibility splays, is shown on Typical Access Bellmouth and Visibility Splay (document reference 2.6.3-2).

2.4.18 The site crossover points are designed to enable HGVs to cross directly over the access or highway, but do not allow for HGVs to turn into or out of them. A standard detail showing the typical layout of the site crossover points is shown on Typical Crossover Bellmouth and Visibility Splay (document reference 2.6.3-3).

2.4.19 For site crossover points on single lane roads where traffic light control may be required, an area for vehicle ‘stacking’ is provided. These areas allow vehicles to pass each other where they have been held at a simultaneous red light.

2.4.20 As part of the Project the following are anticipated to be required:

- Approximately 278 site access points
- Approximately 51 site crossover points
- Approximately 44 combined site access points and site crossover points.

Haul Roads

2.4.21 The almost continuous haul road along the entire length of the alignment is proposed to be constructed within the underground cable corridor and adjacent to the overhead line.

2.4.22 The proposed haul roads are only discontinuous at major obstructions along the underground cable and overhead line corridor such as major roads, railways, areas of environmental or historical significance and major watercourses.

2.4.23 For overhead line construction the haul roads would be typically 6 m wide, with passing places (widening to 8 m) provided at typical intervals of 200 m. The frequency of passing places would be determined by site specific conditions at the detailed design stage and the forward visibility along the haul roads.

2.4.24 For the construction of underground cables, CSE compounds and substations, the haul road would be typically 8 m wide to allow for the delivery and movement of larger equipment using Abnormal Indivisible Load (AIL) vehicles.

2.4.25 The typical cross section of the haul road would be 21 m wide, to allow for topsoil and subsoil storage, drainage, and demarcation fencing. A standard detail showing the typical layout of the haul road is shown on the Design and Layout Plans (document reference 2.6.3-1).

2.4.26 For the assessment of haul road construction, it is assumed that topsoil (and some subsoil) would be stripped and aggregate (e.g. stone) placed on top of the subsoil, delivered to site by HGVs.

2.4.27 Within the underground cable sections, the haul roads would normally be positioned central to the alignment i.e., with cable trenches located either side of the haul roads. Therefore, no additional vegetation clearance would be required, except in some cases where the haul road deviates from the underground cable alignment to reach a site access point onto the public highway.

2.4.28 In some locations, overhead line construction corridors need to be accessed from the underground cable corridors. In these locations, a haul road is proposed to be constructed adjacent and parallel to the underground cable construction corridor to access the overhead lines (this is also referred to as a 'bypass haul road'). This would be provided to separate the overhead line construction vehicle movements from the works associated with the underground cable construction. Bypass haul roads are presented on ES Figure 4.1: Proposed Project Design (document reference 6.4.F1).

EACN Substation Temporary Access Arrangement

2.4.29 The construction access to the new EACN Substation is proposed via the A120, Bentley Road and a proposed permanent private access road between Bentley Road and Ardleigh Road. Under this proposed access arrangement all Project construction traffic would use this route.

2.4.30 If the North Falls and Five Estuaries wind farm projects' construction corridor and associated haul road between Bentley Road and Ardleigh Road is available for use by the Project then this haul road is expected to be used by the Project. If this alternative shared haul road arrangement is used it is proposed that construction vehicles, including HGVs, would be routed to the new EACN Substation via the A120, Bentley Road and the North Falls and Five Estuaries construction corridor haul road between Bentley Road and Ardleigh Road. The proposed permanent private access road between Bentley Road and Ardleigh Road would still be constructed in this scenario to provide access for AIL and light vehicles.

Tilbury North Substation Temporary Access Arrangement

2.4.31 Two proposed temporary access options into the new Tilbury North Substation during construction are proposed.

Public Highway and Traffic Management

2.4.32 Works to the existing highway network, including road widening, associated construction laydown areas and other highway measures (including removal of some street furniture) are required in certain locations along PARs as mitigation to make the existing highway more suitable for construction vehicles. The works would generally consist of widening at constrained locations or widening to provide passing places for HGVs. These locations are presented on ES Figure 4.1: Proposed Project Design (document reference 6.4.F1).

2.4.33 Traffic management would be used where required to maintain public or workforce safety. This would occur when working near the existing highway network, for instance constructing and removing site access points, erecting / dismantling scaffolding and where the underground cables cross the public highway. Further details of traffic management can be found in the Outline CTMP (document reference 7.3).

2.4.34 National Grid would discuss any traffic management, road closures and diversions with the relevant Highways Authority and the emergency services. Further details, including any proposed road closures and diversions are set out within the Transport Assessment (document reference 7.11).

Vegetation Clearance for the Haul Road

2.4.35 To facilitate the construction of the haul roads, temporary vegetation clearance would be required (and reinstated after the works). It has been assumed that worst-case vegetation removal / management would comprise:

- A typical 12 m swathe of removed vegetation (including hedgerows), allowing for up to the 8 m wide haul road and 2 m either side to allow for drainage
- A further 4.5 m either side of the 12 m swathe would be potentially affected, which includes LoD. Therefore, up to 21 m of vegetation falls within the potentially affected category.

2.4.36 For the overhead line haul road, the Project would seek to reduce vegetation clearance to a 10 m swathe, allowing for 6 m wide haul road and 2 m either side for drainage. Passing places would seek to avoid hedgerow crossings, though in some instances this may not be practicable due to visibility / health and safety concerns, and therefore as a worst-case it is assumed a 12 m swathe would be removed.

2.4.37 Where the haul road falls within areas being cleared for the overhead line / underground cable, no additional vegetation clearance would be required.

2.4.38 Temporary crossings would be required over watercourses, streams, and field ditches to maintain the haul roads along the alignment, these would likely consist of temporary bridges or culverts.

2.4.39 At interfaces with the road network, additional vegetation clearance is anticipated. Vegetation clearance associated with site access points to form appropriate visibility splays, and any traffic management requirements would vary from site to site. However, where practicable vegetation would be trimmed or cut to stump rather than full removal. Visibility splays have been developed to inform the Order Limits in accordance with the Design Manual for Roads and Bridges (DMRB) (National Highways, 2025) and with consideration of site-specific conditions, up to a maximum distance of 215 m either side of each site access point.

Overhead Line

2.4.40 The working areas around each new pylon would be cleared of vegetation and fenced appropriately. Access to each pylon location would be installed, and a temporary stone pad would be required adjacent to each new pylon location, on which to place plant such as cranes and piling rigs. The stone working areas would typically be 60 m x 60 m (or 70 m x 70 m for angle / terminal / low height suspension structures and 80 m x 80 m for low height tension structures). Materials would be

brought to site on HGVs and would include the steelwork for the pylons and the conductors (i.e. cabling) wrapped around large drums.

2.4.41 The base of the pylons would involve the excavation of the soil. Piling (which may include percussive) would be required at some pylon locations, subject to the ground conditions. A sample series of ground investigation has been completed (the remaining ground investigation would be undertaken by the Main Works Contractor(s) before detailed design) which would inform the foundation designs. The assessment assumes that percussive piling would be required at each pylon foundation.

2.4.42 Different foundation types can be used for lattice pylons, such as pad and column, vertical tube piles or bored mini pile foundations, depending on the local ground conditions. The type of foundation to be used is typically identified during the detailed design stage by the Main Works Contractor(s) following intrusive ground investigation surveys.

Standard Pad and Column Foundations

2.4.43 For lattice suspension pylons, pad and column foundations are typically used. For tension, low height lattice pylons and terminal pylons, larger and deeper pad and column foundations are required. These are shown on the Design and Layout Plans (document reference 2.6.2).

2.4.44 The following works would be required to install foundations:

- Excavations are required for each pylon leg
- Foundation formwork (mould) is then inserted, cast, and filled with concrete
- The concrete is left to harden (set)
- The excavated hole is backfilled to ground level
- Any remaining sub soil would be removed from site.

Piled Foundations – Tube or Bored Mini-Pile

2.4.45 In areas with poorer ground conditions that are unsuitable for pad and column foundations, vertical steel tube pile foundations or bored mini pile foundations can be used. These are connected by a pile cap at or below ground level.

2.4.46 Using a piling hammer supported by a piling rig, steel tube piles are driven into the ground. A maximum transportable length of up to 15 m is driven at a time and if longer piles are required, additional sections are welded together before continuing the drive.

Pylon Assembly and Erection

2.4.47 Following the installation of working areas and the appropriate foundations, pylon steelwork can be assembled, and the pylons can be erected.

2.4.48 Lattice pylons comprise many separate steel members. These are delivered to site in bundles by HGV. The steelwork for the pylons would be bolted together on the ground and each pylon would be assembled in sections beginning with each of the four steelwork legs being fastened to the stubs (each of the four concrete foundation

legs as described above). The pylon would be erected using a mobile crane to lift the assembled steelwork into position.

2.4.49 Overhead line craft persons help guide the sections into place and bolt the pylon together. The insulators would be fastened to the pylons in preparation for installing the aluminium conductors. The conductors would typically be installed in sections between tension pylons, where the overhead line changes direction. A bow-tie shaped pulling site would be established, for tension / angle pylons, at one end of the section with the conductors running out from a tensioning site at the other end of the section, to keep the wires off the ground. Pilot wires would be used to pull conductors between pylons. Additional fittings, such as spacers (to prevent the conductors from touching each other) and dampers (to prevent oscillations in the overhead line), would then be fitted to the conductors. An earth wire would run along the top of the pylons and contain optical fibres to allow transmission of data around the system.

2.4.50 Helicopters are proposed to be used to support the construction of a limited suite of activities where their use offers the opportunity to reduce the number of vehicle movements and shorten the duration of an activity. Helicopters are proposed to support overhead line stringing by installing the pilot cable (the pulling bond, which is used to pull the conductors onto the pylons). Efficiencies (time and vehicle movements) could be achieved by the helicopter being able to install the main heavy-duty bond on a single flight whereas more traditional methods require an initial lightweight bond to be installed to pull through two or three progressively stronger bonds. This method would take a day or two to install the six bonds required compared with potentially a number of weeks for more traditional methods. Helicopters are not proposed to be used for other aspects of pylon construction owing to the proximity of residential properties and the number of roads to be crossed. It is assumed that helicopters would use existing airfields / helipads as their operational base (including for re-fuelling and parking between tasks). Variation from this by an appointed helicopter operator would be subject to a separate agreement to temporarily use land and be required to satisfy relevant planning and pollution control requirements.

Vegetation Clearance for Overhead Lines

2.4.51 A general approach has been assumed (unless otherwise stated) that where the Project interacts with woodland, trees and hedgerows, clearance would comprise the following approach for standard lattice pylons:

- Vegetation removed (to ground level or sufficient height to meet electrical clearances plus an allowance for growth)[15]: A 40 m wide swathe of vegetation removed to allow for the construction and operation (and maintenance) of the overhead line (to include all physical infringements to conductor, including conductor swing16 (45° blown-out conductor); i.e., 20 m either side of each overhead line centreline)

[15] Hedgerows beneath the overhead line conductors would be retained in-situ. Hedgerow management may be required to meet overhead line electrical clearances (dependent on the hedgerow height) and a temporary 3 m section of hedgerow may require cutting to stump to facilitate the stringing of the pylons (pulling through of the bond wire). Any hedgerow within a pylon footprint will require permanent removal and any hedgerow within a working area may require temporary removal.

[16] Conductor swing is the lateral deflection of a conductor system from its normal vertical position due to wind, which varies based on the length of the span and sag conditions; swinging from the crossarm tip of the pylon.

- Vegetation affected / managed: An additional, up to 8 m of vegetation either side of the 40 m may then need be managed during construction and operation (and maintenance) to allow for electrical clearance from the conductor to be maintained (assumes a generalised allowance of 0.5 m growth per year over a five-year period)
- Vegetation potentially affected: A further, up to 22 m of vegetation either side of the 8 m would be potentially affected, which includes allowances for design flexibility as per the proposed lateral LoD
- Vegetation unaffected: Vegetation beyond the 22 m would be unaffected.

2.4.52 Note that in locations where low height pylons are proposed (at TB135 to TB143 and TB237 to TB244) the general approach values are increased to reflect that the low height pylons are wider and as such a wider extent of vegetation is affected. The values are increased to the following:

- Vegetation removed (to ground level or sufficient height to meet electrical clearances plus an allowance for growth): A 51 m wide swathe of vegetation removed to allow for the construction and operation (and maintenance) of the overhead line (to include all physical infringements to conductor, including conductor swing (45° blown-out conductor); i.e., 25.5 m either side of each overhead line centreline)
- Vegetation affected / managed: An additional up to 16 m of vegetation either side of the 51 m may then need to be managed during construction and operation (and maintenance) to allow for electrical clearance from the conductor to be maintained (assumes a generalised allowance of 0.5 m growth per year over a five-year period)
- Vegetation potentially affected: A further, up to 16.5 m of vegetation either side of the 16 m would be potentially affected, which includes allowances for design flexibility as per the proposed lateral LoD
- Vegetation unaffected: Vegetation beyond the 16.5 m would be unaffected.

2.4.53 Further consideration has been given to veteran trees, other higher quality trees and areas such as ancient woodland that have been identified through arboriculture surveys and a desk study. A review of these features has been undertaken to identify where the generalised approach can / needs to be refined to avoid, prevent or reduce effects to sensitive features. Further details are outlined in the Outline CoCP (document reference 7.2). In addition, the Trees and Hedgerows to be Removed and or Managed Plans (document reference 2.16) presents the generalised approach together with where it has been refined.

2.4.54 The Outline CoCP (document reference 7.2) includes a commitment that following detailed design and prior to construction (of relevant parts of the Project), relevant surveys would be undertaken of arboricultural features that may be impacted or need to be removed to ensure any tree / hedgerow removal is reduced as far as practicable.

Crossing Protection

2.4.55 Where the new overhead line crosses a road, railway line or navigable watercourse, scaffolding would be used to protect the crossing during construction. During site set up, scaffolding would be placed on either side of the feature. Each scaffold would be

designed for the individual crossing that it would protect. The work area required for scaffold protection is dictated by the angle at which the overhead line crosses the asset which it is protecting. Crossing protection / scaffold is shown on ES Figure 4.1: Proposed Project Design (document reference 6.4.F1).

2.4.56 Crossing protection would be made from steel scaffolding, with a net made of steel wire bonds anchored from scaffold to scaffold. Netting would be pulled across using karabiners to connect it to the steel wire bonds. The scaffold would be capable of withstanding a conductor being dropped on it in the unlikely event that this were to occur. The working area around the scaffold would be sufficient to erect the scaffold and to install and accommodate ground anchors or kentledge blocks required to stabilise the structure and catenary wires supporting the nets. Temporary road closures would be required to facilitate the erection and dismantling of the scaffold netting across the public highway. For a minor road, this would be up to approximately 30 minutes, out of peak traffic times. For a major road, this would be up to approximately four hours at night-time.

Substations

2.4.57 The Project requires reinforcement works to the existing National Grid network, including a substation extension at the existing Bramford Substation and modification works to connect into the existing Norwich Main Substation. The Project also requires the construction of the new EACN Substation and the new Tilbury North Substation. Each substation design would be unique, dependent on the proposed equipment and site-specific conditions. However, they would follow a similar typical construction sequence and programme. The typical construction sequence to construct or extend an electrical substation required for the Project would involve the following:

- Vegetation clearance and stripping of topsoil[17] from the proposed permanent site area and any working areas (topsoil would be stored in bunds on site, for reuse as part of landscaping proposals)
- Set up of temporary access, construction compounds including:
  - Temporary lighting
  - Temporary drainage
  - Temporary fencing
  - Laying and compaction of granular material (and asphalt where required)
- Excavation of drainage attenuation features, installation of pipes, etc.
- Earthworks for construction of permanent site access and platform (including forming temporary soil bunds for storing excavated material). Where practicable the temporary and permanent access would be combined
- Civil engineering works, to include permanent fencing, access, drainage and foundations of larger structures and/or equipment that is sensitive to ground settlement)

[17] Subsoil would be stripped where required as per the individual site requirements and proposed earthworks strategies. Where suitable, the subsoil would be reused within the earthworks, or as part of the landscaping proposal where the subsoil cannot be reused it would be removed from site.

- Percussive piling may be required. This would be confirmed through a programme of ground investigation which would inform the foundation designs to be confirmed at detailed design. Therefore, this HRA Report assumes that percussive piling would be required at all new and existing substations
- Installation of structures (e.g. gantries)
- Building works, if the site is to include proposed GIS bays
- Overhead line or underground cabling works, as necessary
- Mechanical and electrical equipment installation
- Testing of equipment
- Commissioning / energisation
- Reinstatement of working areas outside the permanent substation boundary (including environmental mitigation and landscaping as required).

CSE Compounds

2.4.58 Although the Project predominantly comprises overhead lines, there are four sections of underground cable.

2.4.59 Where overhead lines transition to underground cables (and vice versa), a CSE compound is required. This would comprise high voltage equipment and gantry structures, to enable the transition between underground cables and overhead conductors.

2.4.60 A CSE compound is required at each interface between the new overhead line and the new underground cable. The typical construction sequence to install a CSE compound required for the Project would be like that set out for substations, above.

2.4.61 Percussive piling may be required in the CSE compounds. This would be confirmed through a programme of ground investigations which would inform the foundation designs to be confirmed at detailed design. Therefore, this HRA Report assumes that piling would be required at all CSE compounds.

Underground Cables

2.4.62 The standard means of installing underground cables is using open cut techniques. Typically, for open cut construction a construction corridor 120 m wide is required for a double circuit 400 kV underground cable alignment. The 120 m width includes the temporary haul road, soil storage, pre-construction drainage areas, communications cables and typically six cable trenches for 18 cables (three cables per phase) assumed to be to a typical minimum depth of 1.2 m and suitably spaced apart to allow for the required heat dissipation between cables and circuit phases. This is presented in the Design and Layout Plans (document reference 2.6).

2.4.63 Standard open cut installation typically involves the following processes:

- Appropriately fencing off the working area to secure the site from trespassing and livestock
- Vegetation would be removed where necessary and topsoil would be stripped from the working area and stored for re-use

- A temporary haul road would be installed along the alignment to provide access for construction vehicles to the working areas
- Several open trenches (typically six trenches each accommodating three cables) would be excavated, ducts would be placed within the trenches and then backfilled with a surround of cement bound sand (CBS). Telecommunication and ancillary cables are usually placed adjacent to the main cables and within the CBS surround prior to backfilling
- Concrete joint bays would be constructed with the High Voltage Alternating Current (HVAC) cables pulled into the ducts from one joint bay to the next using a winch
- HVAC cables would be jointed (requiring work in a controlled environment)
- The joint bays would be back-filled and link-pillars installed above ground to allow monitoring of the cables
- At road crossings, the above works would require traffic management to safely separate the public from the construction activities. Where the road is wide enough, the trenches and ducts would typically be installed across one side of the road, while the other remains operational (using temporary control). The arrangement would then be swapped to the other side to complete the crossing. For narrower roads, a temporary closure and diversion would be required
- Watercourse crossings would typically be undertaken by damming upstream and downstream of the cable alignment to create a dry working area. Water flows would then be pumped from the upstream side to the downstream side of the working area to maintain the flow of the watercourse.

2.4.64 The preferred approach for this Project is to use ducting. A ducted system would result in a more flexible construction programme and enable quicker reinstatement of ground compared to a traditional direct burial method, where the trench would remain open for much longer. There may be locations where ducting is not the best solution, such as where topography limits installation techniques. In such cases, standard open cut methods may be employed (i.e. direct burial).

2.4.65 The underground cables would typically be delivered to the working area using specialist low-loading articulated lorries. The cable would be transported on cable drums and a crane or specialist hoist would be used to offload these from the delivery vehicles. The underground cables would be pulled off the drums onto rollers in the trenches using winches. The cables would then be pulled through the ducts and would need to be jointed together at joint bays. Depending on the cable manufacturer and length of cable drums available for each section, joint bays would typically be required every 500 m to 1 km. These would be constructed on site in controlled conditions and the finished joints would be suitably protected.

2.4.66 Once the cables have been installed, the temporary works including the haul road and temporary construction compounds would be removed. The land would be reinstated to its previous condition and use (or a condition agreed with the landowner), subject to any planting restrictions, for example, trees cannot be planted over the top or within 10 m of underground cables.

Trenchless Installation

2.4.67 Where opencut trenching is not feasible, for example where the alignment crosses an existing live railway line, or due to environmental mitigation requirements, trenchless installation may be required. An example of which is Horizontal Directional Drilling (HDD). Typically, for HDD, a construction corridor approximately 200 m wide[18] is required. The underground cable would typically be at a depth of 10 m below ground level; however, the depth would depend on the methodology employed and local constraints.

2.4.68 The underground cable would be installed using a drilling or boring method (or a suitable alternative method) to pass beneath features. There are different trenchless methods that could be used, and each method would have a different construction footprint (all of which could be accommodated within the Order Limits). Depending on the technique, there may be a need to undertake several passes to make the hole wide enough to allow the ducts (pipes) to be pulled through.

2.4.69 Trenchless installation is an expensive option, often one of the noisiest activities during construction, requires a longer programme and can be technically challenging in areas of less suitable geology. Therefore, open cut trench installation is the preferred technique where there are no constraints.

2.4.70 Temporary discharges may be required relating to dewatering and over-pumping in the cable sections, particularly where deeper working is required such as at the trenchless crossing. It is anticipated these would be made to ground, rather than to watercourses. Where this is not practicable in localised areas, any discharge to surface water would be made in compliance with relevant consents.

2.4.71 Some trenchless methods require use of a drilling slurry such as bentonite to support the surrounding ground while the drilling / boring commences. The use of pressurised liquids presents a risk of environmental contamination, either through loss of fluids into permeable strata or break-out of fluids at the surface. Adequate mitigation of these risks requires detailed ground investigation and further design of the trenchless crossings. Space for access arrangements from the public highway to the proposed trenchless crossing locations is included within the Order Limits in the event of a pollution incident during construction.

2.4.72 There are up to five trenchless crossings proposed to construct the Project.

Vegetation Clearance for Underground Cabling

2.4.73 It has been assumed (unless otherwise stated) that where the Project interacts with woodland, trees and hedgerows, clearance would comprise the following phased approach for underground cabling:

- To facilitate the construction of the underground cable a typical 120 m wide swathe of vegetation would be removed. Hedgerow removal would be within the 120 m construction swathe (typically limited to 70 m) and removal would be reduced where practicable (restricted to the footprint of the cable swathe and required haul road, soil would not be stored on hedgerows). Following

[18] Trenchless crossings require a wider construction swathe and permanent easement than open cut installation. This is because trenchless crossings require the cables to be installed at a greater depth, and the deeper the installation the greater the separation between the cables needs to be for them to maintain their effective capacity. Additionally, trenchless crossing methods require a degree of separation between drills, ensuring that adjacent drills do not affect or encroach on each other and that cable separation is maintained.

construction, hedgerows would be replanted, however, trees would not be replanted above the cable sections and vegetation would be managed to ensure it does not affect the buried cables

- A further, up to 50 m of vegetation either side of the maximum 120 m swathe would be potentially affected during construction, allowing for the LoD (50 m either side)
- Vegetation beyond the 50 m would be unaffected.

2.4.74 Further consideration has been given to veteran trees, other higher quality trees and areas such as ancient woodland that have been identified through surveys and a desk study. A review of these features has been undertaken to identify where the generalised approach can / needs to be refined to avoid, prevent or reduce effects to sensitive features. Further details are outlined in the ES Appendix 13.6: Arboricultural Impact Assessment (document reference 6.13.A6), the Outline CoCP (document reference 7.2) and Appendix B of the Outline LEMP (document reference 7.4). In addition, the Trees and Hedgerows to be Removed and or Managed Plans (document reference 2.16) present the generalised approach together with where it has been refined.

Modification and Removal of Existing National Grid Pylons

2.4.75 Sections of the existing YYJ and ZB National Grid overhead lines need to be modified to facilitate the connection of the existing transmission network into the new Tilbury North Substation. The works are presented on ES Figure 4.1: Proposed Project Design (document reference 6.4.F1) and ES Figure 4.2: Proposed Project Design – Permanent Features (document reference 6.4.F2) and comprise:

- The re-routeing of the existing YYJ overhead line to a more southerly permanent alignment. This would require eight new pylons and the removal of five existing pylons
- Undergrounding a short section (approximately 0.55 km) of the existing ZB overhead line and the construction of two new CSE compounds, each with a permanent access. In addition, three new pylons would be required and four existing pylons removed
- A number of temporary overhead line diversions onto temporary pylons and use of the proposed permanent pylons in a temporary arrangement would be required to facilitate the works to maintain ‘live’ circuits for the YYJ and ZB overhead lines. It is assumed that these temporary diversions would be required for a minimum of two years but up to three years. Any temporary pylons like the permanent pylons would be approximately 50 m in height and would require similar foundations to permanent pylons, as described earlier in this document
- To facilitate all of the above the YYJ and ZB overhead line conductors need to be re-strung between pylons YYJ116 to YYJ129 and ZB9 to ZB22.

2.4.76 Where pylons are proposed to be removed it may be necessary to establish a 60 m x 60 m working area. Typically, this area would not be stoned, instead if ground conditions are poor, trackway may be used. Removal of pylons would involve removing the conductors by lowering cut sections to the ground, then lowering the insulators and fittings to the ground. Where a pylon is in a clear area and it is safe to do so, the pylon would be removed by ‘felling’ the whole structure. Alternatively, a mobile crane would be used to remove the structure in sections which would then be

lowered to the ground. Once dismantled, the pylon steelwork would typically be broken up on site then removed. The reinforced concrete foundation would then be removed typically to a depth of 1.2 m below ground level. The excavation would then be backfilled and the ground reinstated and any waste removed from site to a suitable licensed waste management facility.

Watercourse Crossings

2.4.77 The haul road requires the crossing of multiple ditches, drains and watercourses. The method of crossing a watercourse would depend on several factors. For example, large or important watercourses, main rivers and all WFD status waterbodies require clear span bridges. Smaller watercourses and ordinary watercourses would use culverts. Watercourse crossings would largely be temporary and would be removed (and land reinstated) after the construction works.

2.4.78 The underground cable would typically cross ordinary watercourse by open cut methods as previously described. Main rivers would be crossed using trenchless methods.

2.4.79 Details of specific watercourse crossings are identified within ES Appendix 4.2: Watercourse Crossing Details (document reference 6.4.A2) which forms the basis of the assessment in the ES (Volume 6 of the DCO application).

2.4.80 Where a PRoW diversion crosses a watercourse, it is assumed a culvert would be required. Watercourse crossings would be temporary and would be removed (and land reinstated) after construction works.

Bridges

2.4.81 For the haul roads depending on the watercourse crossing and on localised conditions, it may be practicable to install a modular bridge. Typically, the components of these bridges are delivered directly to site and the bridge is installed and positioned as required with minimal additional construction works.

2.4.82 If site conditions do not allow for a modular bridge to be used, other bridge structures may be used that require additional construction works, for example, creating concrete abutments or driving sheet piles into ground adjacent to the watercourse and using gabion baskets for the bridge to be laid on. ES Appendix 4.2: Watercourse Crossing Details (document reference 6.4.A2) identifies watercourses that would be crossed with a bridge. This appendix forms the basis of the assessment in the ES (Volume 6 of the DCO application). Typical drawings for bridge crossings are included in the Design and Layout Plans (document reference 2.6.2).

Culverts

2.4.83 For smaller and ordinary watercourses, culverts would typically be used for haul road crossings. The conditions of the watercourse such as its size, depth, ecological properties and strength and volume of flow would determine the components (i.e., twin wall pipes or box culverts) to be used. The most common method would be circular culvert installation, with box culverts used for large ditches or small watercourses. ES Appendix 4.2: Watercourse Crossing Details (document reference 6.4.A2) identifies watercourses that would be crossed with a culvert. This appendix forms the basis of the assessment in the ES (Volume 6 of the DCO application).

Typical drawings for culvert crossings are included in the Design and Layout Plans (document reference 2.6.2).

Third Party (Statutory Undertakers) Works

2.4.84 Prior to the commencement of construction works for the Project, several existing overhead and underground third-party services would need to be diverted, removed, undergrounded, or protected. This is largely where they interface with the Project, for example, with proposed new overhead line crossings, along PARs or at site access point locations. The construction methodology would largely follow the same premise as per the 400 kV overhead line and underground cable proposals but on a reduced scale in terms of width of cable trenches, size of working areas and types and sizes of vehicles required to undertake the works.

2.4.85 The required mitigation methods and duration (i.e., permanent, or temporary mitigation) need to be confirmed with the asset owners prior to any works being carried out. However, third-party works are outlined in the paragraphs that follow.

UK Power Networks Distribution Network Operator 132 kV Pylons

2.4.86 Works to remove, underground and divert existing 132 kV lattice pylon overhead line UKPN infrastructure are shown on ES Figure 4.1: Proposed Project Design (document reference 6.4.F1) and ES Figure 4.2: Proposed Project Design – Permanent Features (document reference 6.4.F2). Flexibility has also been retained and assumed to underground the 132 kV infrastructure along the existing alignment, other than in locations outlined in the Outline CoCP (document reference 7.2).

2.4.87 Works typically would include site set up and access requirements similar to the construction of the new 400 kV pylons and underground cables but reduced in scope due to the smaller scale of the assets to be removed, undergrounded or diverted.

2.4.88 It may be necessary to establish a temporary diversion of the overhead line while the mitigation works are undertaken to ensure security of supply to end users by keeping one of the circuits live. To maintain supply, one live circuit would be routed on temporary poles, masts or pylons around the area of work so that pylon removal can be undertaken in an electrically isolated safe area (the temporary diversion of the overhead lines is required for approximately eight months up to one year). Only the angle structures have been shown on ES Figure 4.1: Proposed Project Design (document reference 6.4.F1) as the type of structures to be used are yet to be confirmed by UKPN, additional structures between those presented would likely be required during the works. A working area with an approximate 50 m radius at pylon locations and 20 m either side of centreline along the spans to be removed / temporarily diverted would be required. Typically, this area would not be stoned; trackway would be used instead.

2.4.89 It is assumed that typically these works would make use of existing access points. For access to temporary construction compounds and the installation of the underground cable diversions associated with these works a bellmouth junction would be required due to the nature and type of vehicle movements (delivery of underground cable drums) to these locations. The connection from the bellmouth to the construction swathe would typically not be stoned; trackway would be used instead.

2.4.90 Dismantling of pylons would first involve removing the conductors then lowering the insulators and fittings to the ground. Where a pylon is in a clear area and it is safe to do so, the pylon would be removed by 'felling' the whole structure. Alternatively, a mobile crane would dismantle the structure in sections which would then be lowered to the ground. Once dismantled, the pylon steelwork would typically be broken up on site and then removed. The reinforced concrete foundation would then be removed (for the purposes of this assessment this is assumed to be a depth approximately 1.2 m below ground level), the excavation backfilled, ground reinstated and any waste removed from site to a suitable licensed waste management facility.

2.4.91 To facilitate the underground cable, the last remaining pylon would be replaced with a terminal pylon supporting a CSE platform.

2.4.92 From here the 132 kV underground cable diversion would be installed as per the 400 kV underground cable alignment but reduced in scope due to the smaller scale of the assets. The installation of underground cable diversions is assumed to be in a single trench typically up to 3 m in width with 1.2 m depth to the cover (worst-case for deep ploughing). An underground cable LoD of 35 m has been applied. Sensitive features would be avoided such as heritage assets, woodland including ancient woodland, and ecologically valuable habitats including Sites of Special Scientific Interest (SSSI),, County Wildlife Sites (CWS) and Local Wildlife Sites (LWS). However, it is assumed that any vegetation within the LoD would be removed during construction and reinstated where practicable following the works.

2.4.93 In addition to the above, to facilitate the dismantling of the PSC and PAB19 route (to the west of Lower Dunton Road and subsequent underground cable diversion route) a new 132 kV substation extension would be required to the west of the existing UKPN Basildon Grid Substation at Dunton Hills. This would accommodate new equipment required to facilitate the undergrounding of the PAB overhead line, due to a lack of space in the existing Basildon Grid Substation footprint. The substation extension would be approximately 80 m by 50 m with a maximum height of 15 m.

UKPN Low Voltage[20] / 11 kV / 33 kV and Openreach Wood Pole Infrastructure

2.4.94 Works to remove, underground and divert existing low voltage / 11 kV / 33 kV and Openreach wood pole UKPN infrastructure along the overhead line alignment are shown on ES Figure 4.1: Proposed Project Design (document reference 6.4.F1) and ES Figure 4.2: Proposed Project Design – Permanent Features (document reference 6.4.F2). Flexibility has also been retained to allow for the undergrounding of this third party infrastructure along the existing alignment, where this would not lead to materially different significant effects assessed within the ES (Volume 6 of the DCO application).

2.4.95 Vehicles and equipment would be similar to that required for the proposed 400 kV overhead line and underground cable works but at a reduced scale relevant to the works. A terminal wood pole structure would be installed at each end of the section to be undergrounded to facilitate the transition from overhead line to underground cable. The installation of underground cable diversions is assumed to be in a single trench typically up to 1 m in width with 1.2 m in depth to the cover (worst-case for deep ploughing). These would be routed either within the existing highway, highway verges or across farmland (using existing gaps through hedgerows where

[19] PSC and PAM are the references for the 132 kV lines.

[20] Lower than 11 kV

practicable). An underground cable LoD of 25 m has been applied. Sensitive features would be avoided such as heritage assets, woodland including ancient woodland, and ecologically valuable habitats including SSSIs, CWS and LWS. Any residential gardens included within the Order Limits reflect existing over sail by existing UKPN low voltage, 11 kV and 33 kV and Openreach infrastructure and access to such areas is required to facilitate removal, or for example, stringing works.

2.4.96 It is assumed works would be completed using suitable vehicles (for example standard 4x4 or agricultural type vehicles and an excavator (size relevant to the works) etc) which would use the public highway or existing agreed access routes (for the wood pole line), field gates and hedgerow gaps (where practicable). It is assumed there would be no requirement to create new physical temporary access tracks.

2.4.97 This work comprises:

- 47 Openreach mitigation designs
- Five UKPN low voltage mitigation designs
- 89 UKPN 11 kV mitigation designs
- 21 UKPN 33 kV mitigation designs (two of which are steel lattice pylon overhead lines).

2.4.98 Where the proposed 400 kV underground cable alignment interacts with existing low voltage / 11 kV / 33 kV UKPN and Openreach wood pole infrastructure, it is proposed that where necessary the height of the existing wooden poles would be raised to allow for safe vehicle clearance underneath during construction and operation (and maintenance). A lateral LoD of 25 m has been applied. The works would require limited vegetation clearance during construction and during operation (and maintenance) vegetation would be managed to maintain the required clearance from the overhead line similar to what is currently required for routine maintenance. Construction activities would include the provision of temporary access to the existing and proposed pole locations, the creation of a working area, the installation of new wooden poles, the stringing of new conductors and fibres and the removal of the existing poles. It is assumed trackway would be used for the access and working areas.

Reinstatement

2.4.99 Once the Project has been constructed and commissioned, the temporary construction working areas would be removed, and the site reinstated. Haul roads (including temporary bridges and culverts) is likely to be removed unless identified as offering a long-term improvement to the environment and land usage during the detailed design (and agreed with the landowner, LLFA and / or the Environment Agency (where required)). Temporary features such as site welfare, working areas, fencing and scaffolding would be removed. Any stripped topsoil would be reinstated, and the site would be returned to its former use, subject to any planting restrictions or agreements with landowners.

2.4.100 Reinstatement would also include landscaping. This is likely to include reseeding grassland areas, replanting hedgerows, and trees. It would also include additional landscape planting in some areas to help screen the new infrastructure from sensitive receptors.

2.4.101 Proposed planting is detailed within the Outline Landscape and Ecological Management Plan (LEMP) (document reference 7.4), which outlines proposed locations and specifications of planting, along with required maintenance schedules to ensure the success of the landscaping scheme.

2.5 Project Description – Permanent Features

Overhead Line (Including CSE Compounds)

2.5.1 The National Grid standard for overhead lines operating at 400 kV is for pylons carrying two circuits one each side of the pylon, each with three conductors i.e., double circuit configuration.

2.5.2 The Project consists of approximately 159 km of overhead line comprising approximately 509 pylons, either standard steel lattice pylons or low height steel lattice pylons and gantries (typically up to 15 m in height) within proposed CSE compounds. The new overhead line would use triple Araucaria conductors (or alternative technology that performs to the same or better standard in relation to noise on standard lattice pylons). Three types of pylons are proposed as part of the alignment:

- Suspension pylons: used in straight line positions to suspend the conductor on vertical suspension insulator strings
- Tension (also called angle) steel lattice pylons: support the overhead line where the line changes direction. Tension pylons may also be used in a straight-line situation to break up a long section of suspension pylons for loading and stringing purposes
- Terminal pylons: a type of tension pylon used at the ends of overhead lines where they connect to substations or to underground cables via a CSE compound or substation.

2.5.3 Additionally, to facilitate the overhead line connection at the new Tilbury North Substation to the existing network, modifications to the existing YYJ and ZB overhead line are required. Eleven new pylons are required, and eight existing pylons would be removed. Additionally, two CSE compounds are required to facilitate the short section of underground cable on the ZB route.

2.5.4 The design assumes standard steel lattice pylons for the majority of the alignment which would be approximately 50 m in height (compared to approximately 30 m for the existing 132 kV pylons in the area and of a similar size to the existing 275 / 400 kV pylons in the area). Pylon extensions would be required in some locations to allow extra height to clear existing features and maintain electrical clearance to the ground. The intention is to use glass insulators as standard across the Project, however porcelain or polymeric insulators remain an option for the Main Works Contractor(s), subject to procurement and / or site-specific needs.

2.5.5 Pylons would typically be at 330 m spacing, subject to site constraints.

2.5.6 Where new pylons are erected parallel to the existing 400 kV infrastructure, an 85 m separation distance would be required as shown on ES Figure 4.1: Proposed Project Design (document reference 6.4.F1) and ES Figure 4.2: Proposed Project Design – Permanent Features (document reference 6.4.F2).

2.5.7 In two locations low height steel lattice pylons are proposed. These have only two cross arms as opposed to three on a standard lattice pylon, thus reducing their height by approximately 10 m (to approximately 40 m) but widening them by approximately 10 m. Low height steel lattice pylons are proposed:

- Between Great and Little Waltham as mitigation for Langleys House (Grade I listed building), and to a lesser extent Langleys Registered Park and Garden (Grade II) and Great and Little Waltham Conservation Areas (refer to ES Chapter 11: Historic Environment (document reference 6.11)) – pylon reference TB136 – TB142
- To the east of Thurrock Airfield to provide overflight clearance mitigation – pylon reference TB238 – TB243.

Cable Sealing End Compounds

2.5.8 The CSE compounds, as described previously, typically occupy a footprint of approximately 90 m x 64 m for a 400 kV double circuit. Each CSE compound would have two gantries (typically 26 m wide by 15 m tall) within the CSE compound which then connect to the CSE compound via high voltage busbars and other high voltage electrical equipment. In addition, a small portable relay room may be required in each compound. Each compound would be surrounded by security fencing typically up to 4 m high, to protect the equipment. There would be a minimum 2 m clear zone around the perimeter of the fence to allow maintenance and access. Operational lighting is not required. Task lighting may be required when undertaking specific maintenance activities.

2.5.9 There would be a permanent access road installed to connect each CSE compound to the local road network providing access for operation (and maintenance) activities which would be up to 5 m wide (increasing locally for passing places and for tracking of larger vehicles on bends). It is assumed that these would be constructed using a bound solution (asphalt or concrete pavement as a worst-case), however, this would be determined at the detailed design stage. Vegetation planting would be provided around each CSE compound to help screen the site; further details are provided within the Outline LEMP (document reference 7.4) and presented on ES Figure 4.2: Proposed Project Design – Permanent Features (document reference 6.4.F2).

2.5.10 Drainage would also be required and is assumed to comprise an attenuation pond (or alternative feature) and outfall as presented on ES Figure 4.2: Proposed Project Design – Permanent Features (document reference 6.4.F2).

Underground Cables

2.5.11 The underground cables, detailed above, would typically comprise 18 transmission cables. Each cable would be approximately 150 mm diameter and buried within a series of six trenches excavated to a typical minimal depth of 1.2 m and would be surrounded by cement bound sand to aid dissipation of heat from the cables. This would then be topped with protective warning tiles and tape which helps protect the cables from accidental mechanical damage. One or more of the cable trenches would also include small diameter communication cables (typically two communications cables in total).

2.5.12 Depending on the cable manufacturer and availability of cable lengths, joint bays would be required every 500 m to 1 km on each cable trench. At these locations,

above ground link pillars and marker posts would be required. The dimensions, frequency and specific locations of the link pillars are to be confirmed through detailed design, however where practicable they would be located near field boundaries, with typical dimensions of 2 m x 0.7 m x 1.5 m plus for example a timber fenced area around them, typically 3 m x 4 m.

2.5.13 Above ground marker posts are required where cables run across a railway, run across agricultural land or change direction, at joint positions and at other locations where required by the cable design.

2.5.14 A below ground chamber would also be required, at every or every other joint bay, for communications cables.

Proposed New EACN Substation

2.5.15 The operational footprint of the new AIS EACN Substation is proposed to be approximately 550 m x 230 m with heights up to approximately 15 m excluding any requirement for landscaping and cable / overhead line connections. In addition, several small buildings would be constructed to house electrical equipment, battery storage, workshops, together with suitably sized office / amenity buildings. The site would be surrounded by security fencing typically up to 4 m in height to protect the equipment. There would be a minimum 2 m clear zone around the perimeter of the fence to allow maintenance and access.

2.5.16 Exterior and interior lighting[21] would be provided at the site to allow for safe movement and the operation (and maintenance) of equipment. Lighting columns would typically be 12.5 m tall. All lighting would be designed in accordance with the appropriate design standards. The position of lighting columns would be subject to detailed design and would be determined by safety and operational requirements. Lighting would be directional and is intended to support safe movement of pedestrians and vehicles around the site (and reduce light spill to the local environment). The lighting would therefore not be on by default, only while there are activities happening at the site as dictated by operational requirements. Additional task lighting may be required when undertaking specific maintenance activities.

2.5.17 Vegetation planting would be provided at the new EACN Substation to help screen the site, and any surplus spoil would be incorporated into landscaping proposals as detailed within the Outline LEMP (document reference 7.4).

2.5.18 Improvements to the public highway along the PAR (carriageway widening and associated works to Bentley Road and Ardleigh Road) and the proposed permanent private access road between Bentley Road and Ardleigh Road, to the south-west of Little Bromley would be retained permanently. These would be retained to provide permanent access to the new EACN Substation for HGVs and AILs during operation (and maintenance). The permanent private access road would remain private and be gated to prevent unauthorised access; this road is presented on ES Figure 4.2: Proposed Project Design – Permanent Features (document reference 6.4.F2). This would be up to 4 m wide (increasing locally for passing places and for tracking of larger vehicles on bends). It is assumed, that this would be constructed using a

[21] The maximum illuminance would be approximately 20 Lux within the fence line with an approximate maximum illuminance of ten Lux around the perimeter fence line. The minimum average illuminance would be approximately six lux, utilising LED lighting.

bound solution (asphalt or concrete pavement as a worst-case), however, this would be determined at the detailed design stage.

2.5.19 Drainage would also be required and is assumed to comprise an attenuation pond (or alternative feature) and outfall as presented on ES Figure 4.2: Proposed Project Design – Permanent Features (document reference 6.4.F2).

2.5.20 Directly to the south of the new EACN Substation a UKPN Substation is required to provide Low Voltage Alternating Current (LVAC) supply from the local UKPN network to the new EACN Substation. It would be approximately 25 m by 25 m with a maximum height of 5 m. It would include a distribution transformer, enclosure, and a distribution board, along with underground cables.

Proposed New Tilbury North Substation

2.5.21 The operational footprint of the new GIS Tilbury North Substation is proposed to be approximately 340 m x 300 m with heights of approximately 15 m excluding any requirement for landscaping and cable / overhead line connections. A new GIS hall building is proposed, which would be approximately 135 m x 20 m x 15 m (length x width x height). GIS halls are required for GIS substations to contain the specialist equipment. This is a different technology to what is proposed at the new EACN Substation, which would use AIS. GIS equipment can be positioned closer together as it is not reliant on just air for insulation, as a result the footprint of the substation can be reduced. An associated annex would also be required with dimensions of approximately 135 m x 12 m x 15 m. These buildings would typically be steel framed with metal sheet cladding finish. The site would be surrounded by security fencing typically up to 4 m in height and other security features to protect the equipment. There would be a minimum 2 m clear zone around the perimeter of the fence to allow maintenance and access.

2.5.22 Exterior and interior lighting would be as per the proposed new EACN Substation21.

2.5.23 Drainage would also be required and is assumed to be as per the proposed new EACN Substation as presented on ES Figure 4.2: Proposed Project Design – Permanent Features (document reference 6.4.F2).

2.5.24 The permanent access would be up to 5 m wide (increasing locally for passing places and for tracking of larger vehicles on bends). It is assumed, that this would be constructed using a bound solution (asphalt or concrete pavement as a worst-case), however, this would be determined at the detailed design.

Modifications to Existing Substations

2.5.25 Modifications to existing substations are required as part of the Project. The details of the likely works required at existing substations are outlined in the paragraphs that follow.

Norwich Main Substation

2.5.26 Modification works are required to allow the Project to connect into the Norwich Main Substation. The works required for the Project would comprise:

- Two new 400 kV Full Line Tension gantries (up to 15 m in height) within Norwich Main Substation

- Installation of new and modifications to existing apparatus within the footprint of Norwich Main Substation.

Bramford Substation

2.5.27 An extension would be needed at the existing Bramford Substation. The extension would comprise:

- Extension of the existing site compound with use of existing site access arrangements
- Modifications of the existing retaining structure
- Equipment up to a maximum typical height of 15 m
- Mix of impermeable concrete ground surfaces surrounded by permeable stone chippings
- Electrified palisade fence typically up to 4 m high
- Exterior21 and interior lighting to allow for safe movement and the operation (and maintenance) of equipment. Lighting would be designed in accordance with the appropriate design standards. Additional task lighting may be required when undertaking specific maintenance activities.
- Drainage works
- Installation of new and modifications to existing apparatus within the footprint of Bramford Substation.

Modifications to Existing Highways

2.5.28 Permanent modifications to existing highways are required as part of the Project. The details of the likely works required are provided below.

Permanent Site Access Points

2.5.29 Permanent site access points are required where permanent access roads would be provided to CSE compounds and new substations. These have been designed in the same way as the temporary site access points and the same typical detail applies.

2.5.30 Permanent site access points are presented on ES Figure 4.2: Proposed Project Design – Permanent Features (document reference 6.4.F2) and comprise:

- JC-B013 permanent site access point on Raydon Road and a new access track to the CSE compound
- TB-B021 permanent site access point on Boxted Road with permanent access to the CSE compound
- TB-B035 permanent site access point on Crabtree Lane to the CSE compound
- TB-B079 permanent site access point on Fairstead Road to the CSE compound
- TN-B011 permanent site access point off High Horse Lane to the CSE compound
- Tilbury North Substation has two options:

- TN-B007 permanent site access point off Brentwood Road to Tilbury North Substation
- TN-B014 permanent site access point off Buckingham Hill Road to Tilbury North Substation.

Highway Modifications

2.5.31 The left turn acceleration lane from the B1070 onto the A12 Ipswich Road would be permanently widened and lengthened. The existing footpath at this location would also be realigned and offset from the back of the kerb with a 2 m proposed verge separation.

2.5.32 The carriageway on Bullen Lane, Bentley Road and Ardleigh Road would also be permanently widened to facilitate future access requirements.

2.5.33 These modifications are presented on ES Figure 4.2: Proposed Project Design – Permanent Features (document reference 6.4.F2).

2.6 Project Description – Operation (and Maintenance)

Operational Workforce and Vehicles

2.6.1 Operational and maintenance activity would require a limited workforce. During operation (and maintenance), National Grid would require infrequent access to ensure the operational Project is appropriately surveyed, assessed, and maintained. Access would typically be made by foot, 4x4 or tractor and trailer.

2.6.2 Additionally, National Grid often uses helicopters to survey and monitor the network, as large distances can be covered without requiring access to the land surrounding the transmission infrastructure.

2.6.3 National Grid also has a fleet of drones, which allows inspections of parts of the transmission network that are more difficult or costly to reach.

Assumptions on Materials and Waste During Operation

Materials and Waste During Operation

2.6.4 The Project would require limited materials and generate limited waste during operation (and maintenance), other than at the end of the design life of project components, when these would be replaced. At the end of life of project components, the materials consumed and wastes produced would be similar to those identified during construction. Existing National Grid processes and systems encourage the application of the waste hierarchy on maintenance projects.

Overhead Line (Including CSE Compounds)

2.6.5 The typical lifespan of an overhead line would be at least 40 years, depending on use and location. Over this time, the overhead line and CSE compounds would be subject to regular inspection from the ground (on foot or using a small van / 4x4 vehicle) or by helicopter to check for visible faults or signs of wear in line with existing maintenance requirements at any point in time. The inspections would confirm when

refurbishment is required and indicate if plant / tree growth or development were at risk of affecting safety clearances.

2.6.6 Maintenance activity carried out on lattice pylons would involve climbing the pylon to access the work area (e.g., conductors). Access to the pylons may require temporary access works to gain entry to site.

2.6.7 There are two main types of overhead line refurbishment:

- 'Fittings only' refurbishment would be undertaken if the conductors were still in good condition. The refurbishment involves removing and replacing the insulators, their associated fittings and the spacers that keep the conductors separate in the spans between pylons. The insulators and fittings have a life expectancy of approximately 20 to 40 years
- Full refurbishment would typically be needed at the end of the lifespan of the overhead line (40 years, although pylons have a typical life expectancy of 80 years) and works would be subject to separate permissions, to consider the latest site conditions and legislation in force at that time.

2.6.8 Refurbishment would usually be carried out in two stages because the overhead line has two circuits, one on each side of the pylon. This means that work can be undertaken on one side only, so that the other side can be kept 'live'. Once all the work has been completed on the first side, the circuit would be re-energised. The opposite side would then be switched off so that the work could be carried out on the other side.

2.6.9 The refurbishment works would require temporary access tracks, small compounds and, potentially, scaffolding to protect roads and other features during the work. Vans would be used to carry workers in and out of site and trucks would be used to bring new materials and equipment to site and remove old equipment. Once the Project has been constructed and commissioned, including the temporary installation of access roads and installation of scaffolding to protect roads, railways and footpaths would be required as necessary (like the initial construction requirements).

2.6.10 The typical design life of a CSE compound would be at least 40 years, depending on use and location. The CSE compounds would contain equipment that would be monitored remotely. Site inspections would include visual checks for signs of damage or wear of the condition of non-mechanical equipment, structures, and buildings. Mechanical (manually operated) earth switches would require inspection and servicing as part of these visits. Intermittent upgrades and repairs would be complete as and when required to ensure their ongoing operation.

2.6.11 It is assumed that the maintenance of permanent drainage would be undertaken using agricultural type vehicles (e.g. tractor and trailer, small excavator) when required.

Underground Cables

2.6.12 Underground cables have a typical design life of at least 40 years. Over this time, the cables would be subject to regular checks. Inspections would be undertaken approximately every three years using the fibre-optic cables that were installed alongside the underground cables during construction. This would identify whether cable repairs were required. This would involve light vehicle access to any joint bays along the cable alignment and typically teams of two staff members.

2.6.13 When a repair is needed, the area where the fault is located would be accessed using a temporary access track. A working area would be established, like that used for construction, and the ground would be excavated. If a cable needs to be replaced, then that section of the cable (between two joints) would need to be removed and new joints constructed. A benefit of ducting these cables is that the whole length to be removed does not necessarily need to be excavated depending on the condition of the duct and cable. Staffing and vehicle requirements for maintenance activities would vary depending on the scale of the works.

2.6.14 As outlined in the description of construction activities, there would be restrictions regarding works directly above the underground cables. For example, trees cannot be planted over the top or within 10 m of underground cables.

2.6.15 For the purposes of the assessment, a permanent easement of 60 m is assumed for open cut installation and 180 m for trenchless installation. This has been reduced in some locations to consider sensitive features or may increase subject to site conditions.

EACN Substation, Tilbury North Substation and Other Substation Modifications

2.6.16 The new EACN Substation, new Tilbury North Substation and other existing substations to be modified as part of the Project would typically be unmanned during periods of general operation. However routine site visits would be required to visually inspect the condition of the equipment, structure, and buildings for signs of wear and tear. Routine maintenance would also need to be undertaken on a three-year cycle for each circuit. This involves electrical isolation of the equipment and checks to the equipment which may lead to maintenance of certain moving parts, electrical contacts, etc., to ensure the system continues to operate without fault. In addition, there would be maintenance of the auxiliary systems which would be tested monthly and maintained as required. The proposed works are not likely to change the current activity pattens within the substations. The routine inspections would only require small teams with limited light vehicle movements. During periods of maintenance staffing and vehicle numbers would increase varying with the scale of the works required.

2.6.17 It is assumed that the maintenance of permanent drainage would be undertaken using agricultural type vehicles (e.g. tractor and trailer, small excavator) when required.

2.6.18 Under the NETS System Security and Quality of Supply Standard (SQSS), National Grid has a duty, following the occurrence of a secured event on the onshore transmission system, to take measures to re-secure the system to the above operational criteria as soon as reasonably practicable. To meet this duty, the permanent site access roads to the new EACN Substation and new Tilbury North Substation would be retained to maintain AIL access to the sites.

Decommissioning

2.6.19 There are currently no specific plans to decommission the Project. It is expected that the transmission of electricity would continue for as long as there is a business case for doing so and that any decommissioning activity would occur decades into the future. To date, relatively few transmission projects have been decommissioned

since the main expansion of such infrastructure in the 1950s and 1960s. The cables and pylons for overhead transmission lines are replaced periodically, ordinarily under National Grid's permitted development rights.

2.6.20 The pylons comprise open, lattice structures which can be easily dismantled. It is expected that proposals for decommissioning would be subject to separate consenting procedures, including HRA screening of the proposed activities, and taking account of the baseline as it exists at the time of decommissioning. Therefore, decommissioning is not considered further in this HRA Report.

Design Scenarios and Flexibility

2.6.21 Flexibility within the design of a DCO project is permitted to provide a design and build Main Works Contractor(s) with sufficient scope for 'value engineering' through innovative design and / or construction techniques and to respond to unknown information such as ground conditions. As such, the Project design and the assessment in this report reflects the need for flexibility.

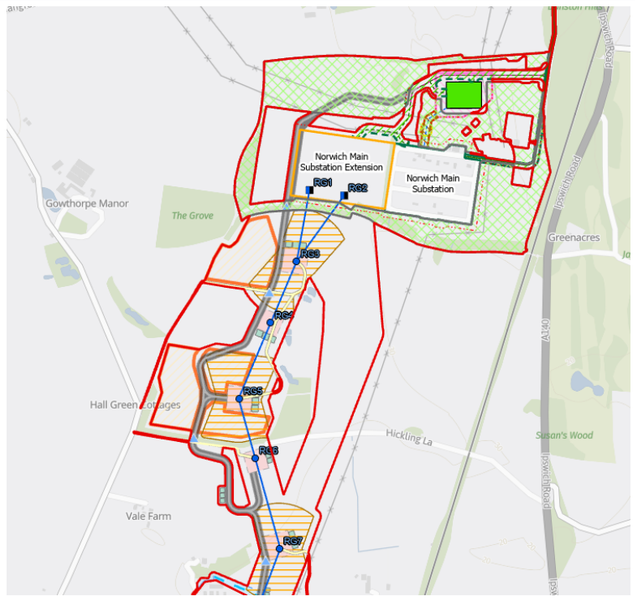
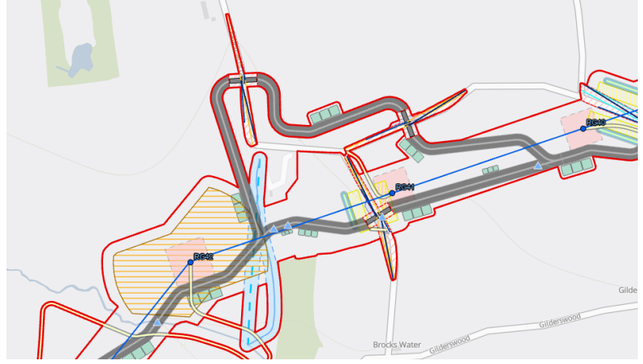
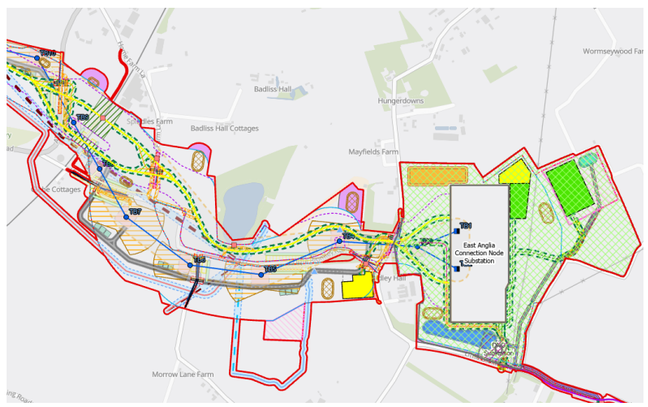
2.6.22 The Order Limits include LoD, which represent the maximum locational flexibility for permanent features, such as the overhead line, pylons, underground cables, CSE compounds, the proposed new EACN Substation and the proposed new Tilbury North Substation.

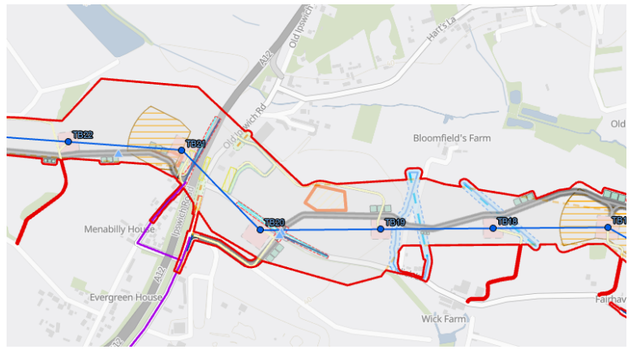
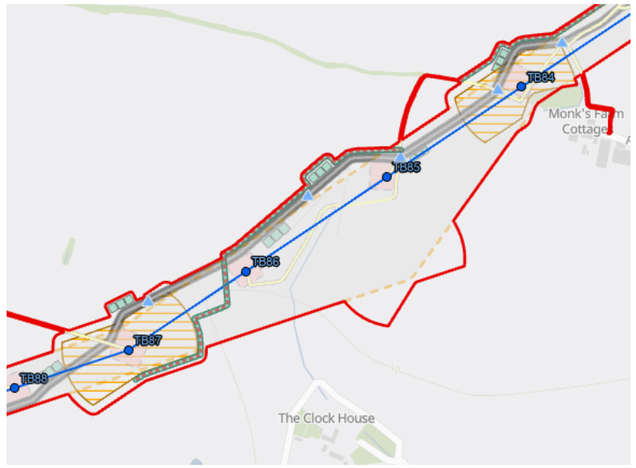
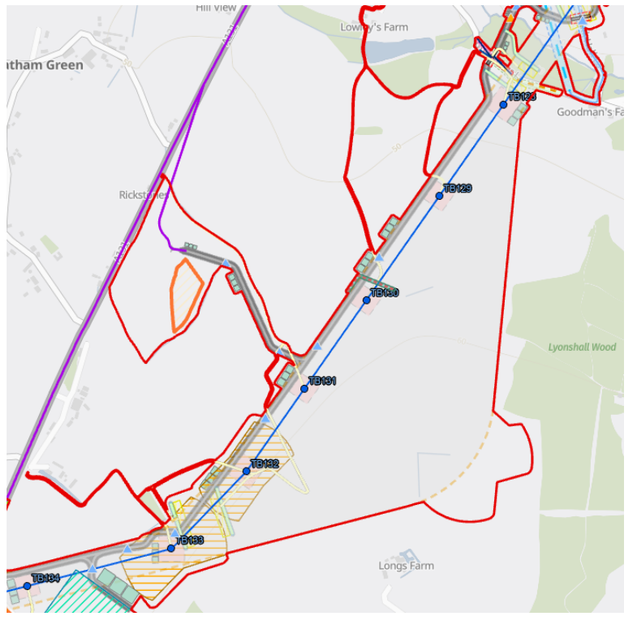
2.6.23 The assessment in this report is based on the description of the design, construction, and operation (and maintenance) of the Project presented in this section of the HRA

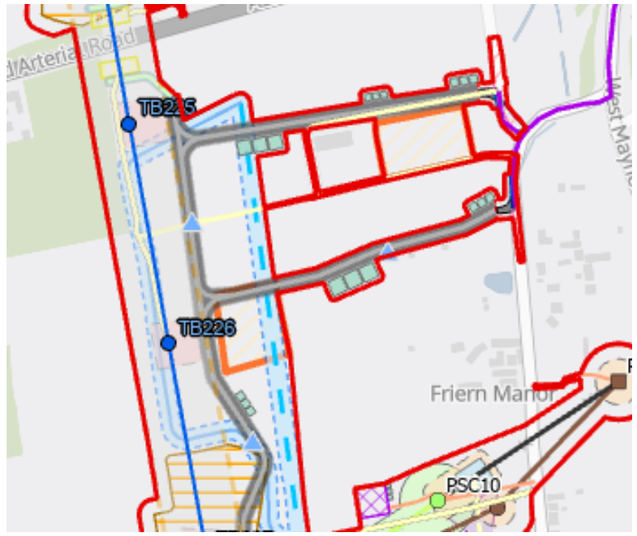
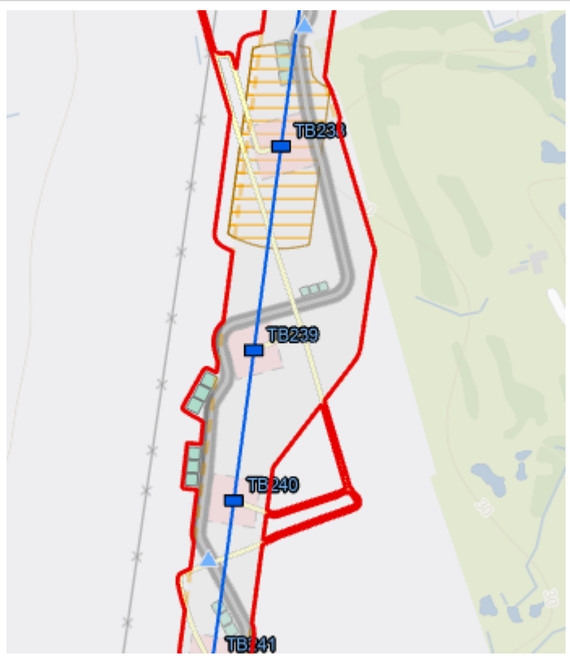
2.6.24 The HRA Screening and the Appropriate Assessment consider sensitivity testing / flexibility in design that may be adopted to see if there would be new or different conclusions / effects. Sensitivity testing/flexibility includes:

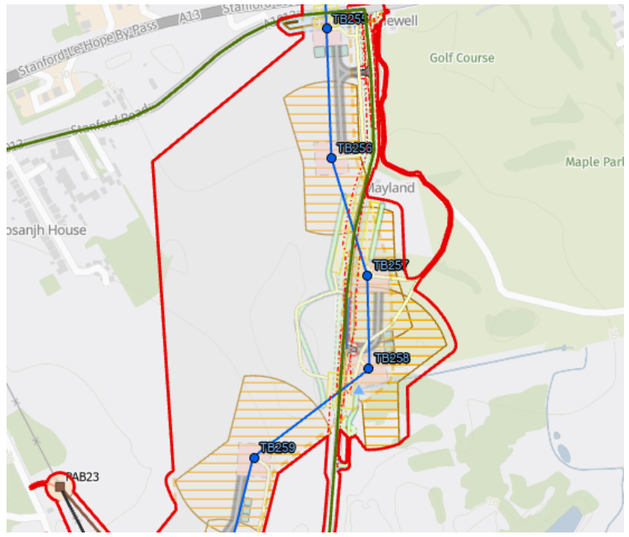
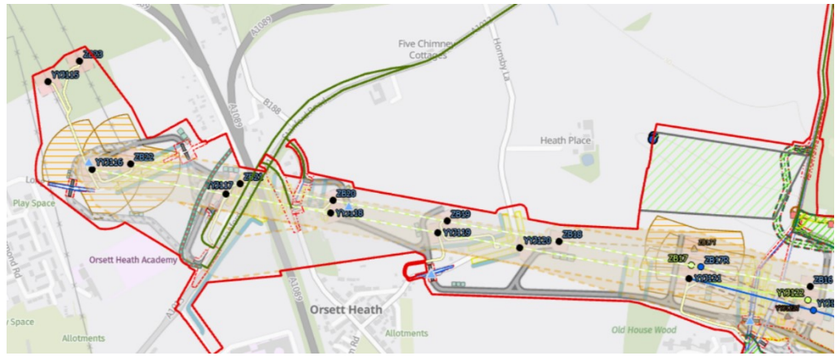
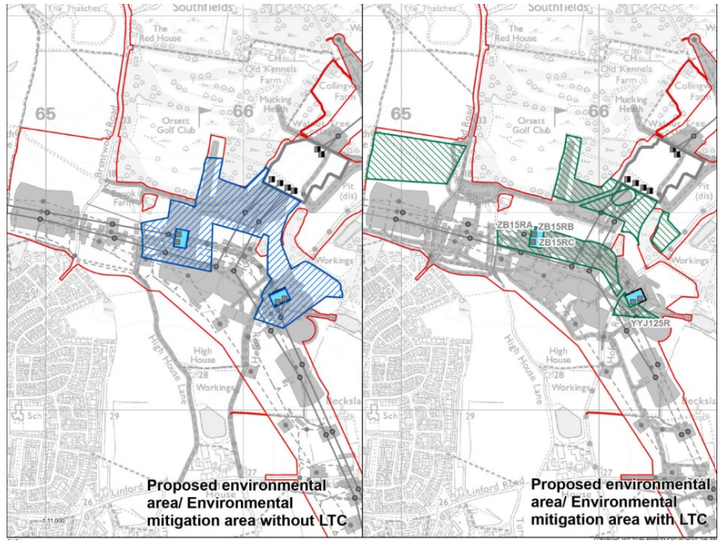
- Assessment of an alternative construction schedule: an assessment to determine if effects would be different if the construction programme was extended or delayed
- Flexibility in design:
  - Flexibility within the LoD, for example changes to the location or height of permanent features, such as pylons, within the LoD (other than where locations of pylons are committed to as detailed within the Outline CoCP (document reference 7.2))
  - Flexibility within Order Limits, for example, there are elements of the Project where a design scenario has been identified. To assess the potential effects of these elements, a single scenario is assessed within this report with an assessment of the flexibility presented at the end of the screening and Appropriate Assessment stages. Table 2.2 presents the design scenarios considered within this report.

Table 2.2 Summary of design scenarios

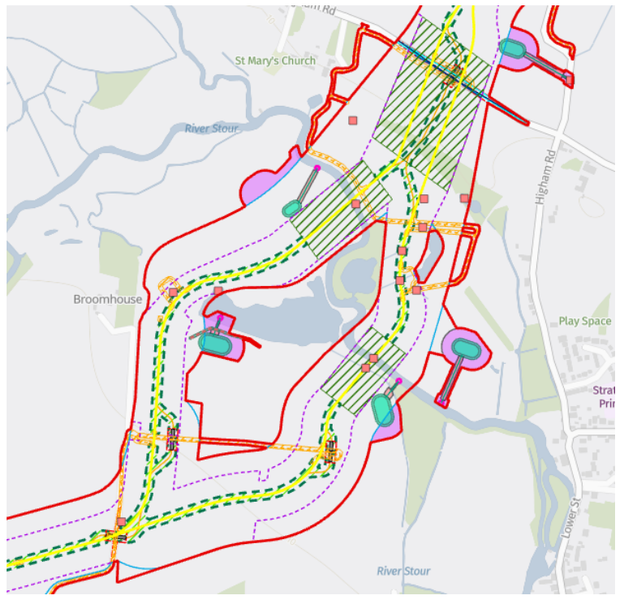
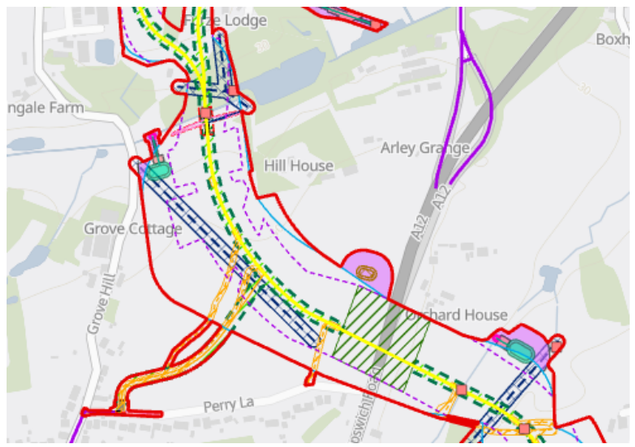
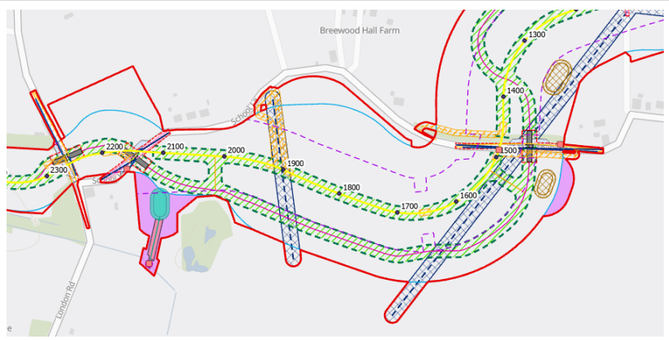
Name of Design Scenario	Image	Description
1) Norwich Main Substation (Section A)		ES Figure 4.1: Proposed Project Design (document reference 6.4.F1) and Figure 4.2: Proposed Project Design – Permanent Features (document reference 6.4.F2) show an overhead line alignment exiting the Norwich Main Substation between RG001 and RG007. The LoD and Order Limits in this location have been widened to the east to allow flexibility to change the alignment should planning consent not be granted for a battery storage facility to the south of the substation.
2) Anglian Water Sewage Works south of Tabernacle Lane (Section A)		ES Figure 4.1: Proposed Project Design (document reference 6.4.F1) shows two haul roads within the Order Limits between RG40 and RG42. Two haul roads are presented to provide an alternative haul road that avoids crossing through an Anglian Water sewage works and potential land it has noted may be used for reed planting.
3) Silica sands mineral site east of the proposed new EACN Substation (Section C)		ES Figure 4.1: Proposed Project Design (document reference 6.4.F1) and Figure 4.2: Proposed Project Design – Permanent Features (document reference 6.4.F2) shows an overhead line alignment and underground cable alignment between TB1 and TB8. The LoD and Order Limits have been widened in this area to allow flexibility to facilitate a swap of the overhead line and underground cable north or south of Little Bromley Road, subject to the progression of the silica sands minerals site, i.e. locating the underground cables to the north of Little Bromley Road would reduce sterilisation of potential silica sands mineral site.

Name of Design Scenario	Image	Description
4) Flying Trade Group and Crown Quarry east and west of the A12 (Sections C and D)		ES Figure 4.1: Proposed Project Design (document reference 6.4.F1) and Figure 4.2: Proposed Project Design – Permanent Features (document reference 6.4.F2) shows widened Order Limits between TB18 and TB22. The LoD and Order Limits have been widened between TB18 and TB22 as there are a number of planning applications associated with the Flying Trade Group and Crown Quarry developments adjacent to the A12.
5) Mineral extraction site north-west of Kelvedon (Section E)		ES Figure 4.1: Proposed Project Design (document reference 6.4.F1) and Figure 4.2: Proposed Project Design – Permanent Features (document reference 6.4.F2) shows an overhead line alignment between TB84 and TB87. The LoD and Order Limits have been widened between TB84 and TB87 to allow flexibility to change the alignment to reduce effects on a potential mineral extraction site should it be identified as an allocation in a future mineral plan.
6) Lions Hall Minerals Site east of the A131 and to the west of Lyonshall Wood Ancient Woodland (Section F)		ES Figure 4.1: Proposed Project Design (document reference 6.4.F1) and Figure 4.2: Proposed Project Design – Permanent Features (document reference 6.4.F2) shows an overhead line alignment between TB128 and TB133. The LoD and Order Limits have been widened between TB128 and TB133 to allow flexibility to change the alignment to reduce effects on the Lions Hall Minerals Site should it be progressed.

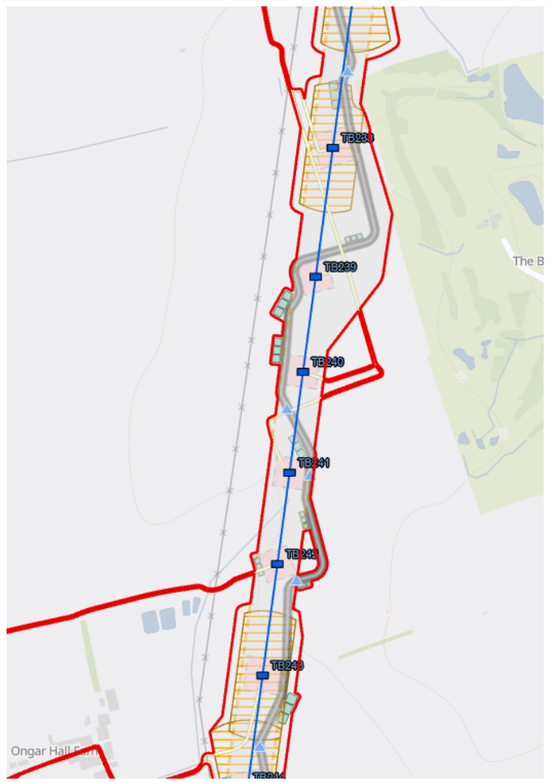
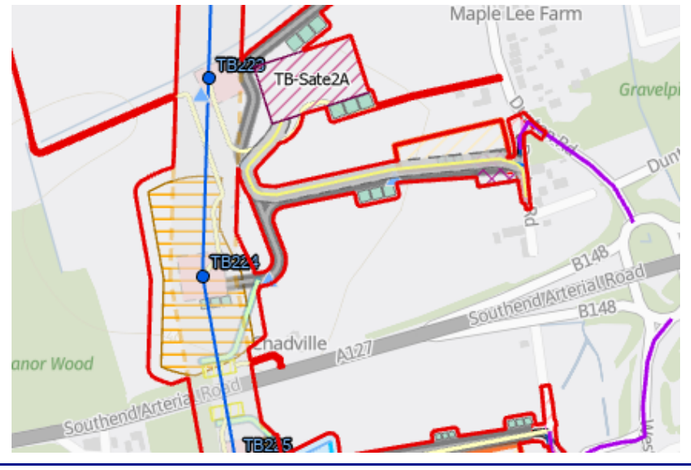
Name of Design Scenario	Image	Description
7) Chelmsford Bypass east of the A131 and to the west of Lyonshall Wood Ancient Woodland (Section F)	As above	ES Figure 4.1: Proposed Project Design (document reference 6.4.F1) shows a haul road between TB130 and TB131. The Order Limits have been widened to facilitate an alternative haul road off the proposed Chelmsford Bypass new roundabout, should the Chelmsford Bypass progress, which would sever the currently proposed construction haul road that follows the overhead line alignment.
8) Crest Nicholson housing development south of the A127 (Section G)		The ES Figure 4.1: Proposed Project Design (document reference 6.4.F1) shows two haul roads/construction access arrangements within the Order Limits between TB225 and TB226. Two haul roads are presented to provide an alternative haul road should the Crest Nicholson housing development progress.
9) BPA pipeline crossing west of Langdon Hills Golf and Country Club (Section H)		ES Figure 4.1: Proposed Project Design (document reference 6.4.F1) and Figure 4.2: Proposed Project Design – Permanent Features (document reference 6.4.F2) shows an overhead line alignment between TB238 and TB240. The LoD and Order Limits have been widened between TB238 and TB240 to allow flexibility to enable an alternative alignment with more angles to facilitate a more perpendicular crossing at the BPA pipeline.

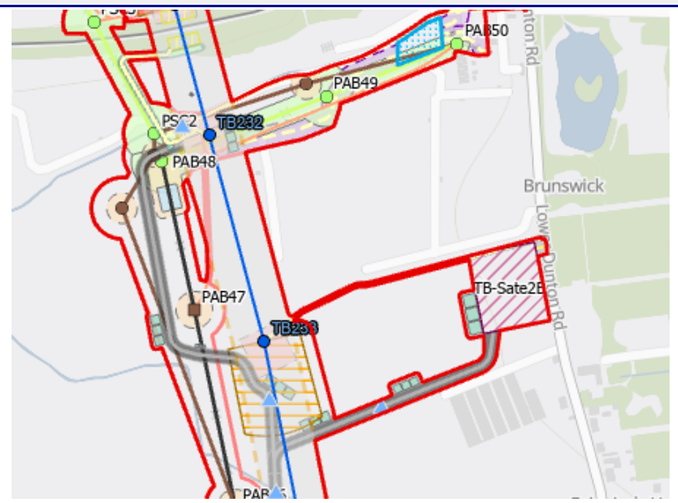
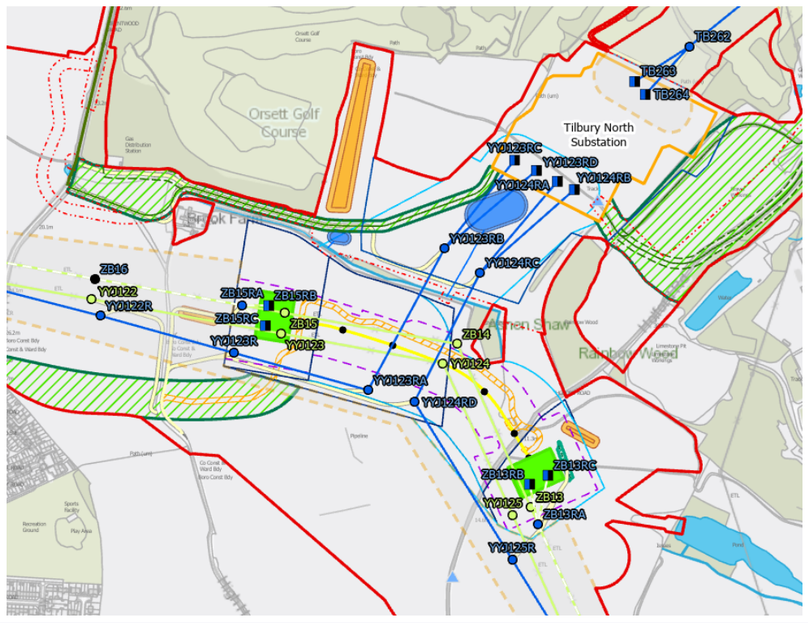
Name of Design Scenario	Image	Description
10) Southfields development south of the A1013 (Section H)		ES Figure 4.1: Proposed Project Design (document reference 6.4.F1) and Figure 4.2: Proposed Project Design – Permanent Features (document reference 6.4.F2) shows an overhead alignment between TB255 and TB259. The LoD and Order Limits have been widened between TB255 and TB259 to allow flexibility to allow an alternative alignment if the Southfields housing development does not go ahead, as the alignment could then move to the west, removing two crossings of Buckingham Hill Road, a crossing of a historic landfill site and pylons situated within parkland and a quarry site.
11) Lower Thames Crossing (LTC)[22] south of the proposed new Tilbury North Substation (Section H)	 	ES Figure 4.1: Proposed Project Design (document reference 6.4.F1) and Figure 4.2: Proposed Project Design – Permanent Features (document reference 6.4.F2) shows temporary and permanent works to existing overhead line infrastructure (YYJ and ZB) to the south of the A13 and A1089 junction in the proximity of Heath Road. The LoD and Order Limits have been widened at this location to allow a change to the design should the ongoing coordination identify a change is required. Should LTC not be progressed, an alternative Environmental Area is also proposed.

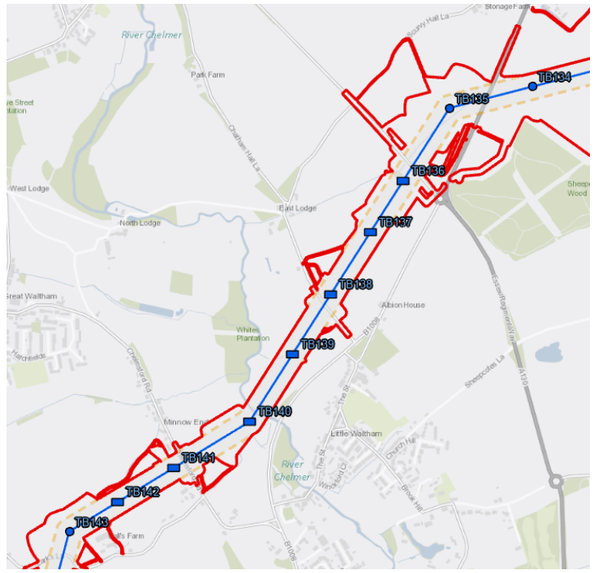
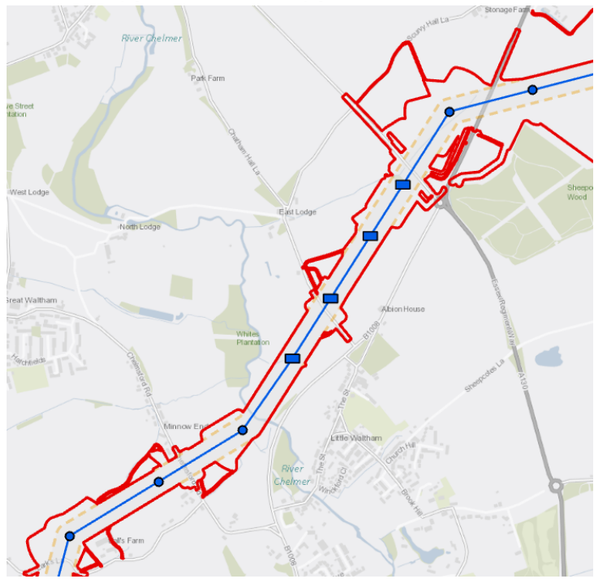
[22] The LTC project is shown on Figure 17.1: Long List of 'Other Developments' Considered within the Cumulative Impacts Assessment (document reference 6.17.F1)

Name of Design Scenario	Image	Description
12) River Stour crossing west of Stratford St Mary (Section C)		ES Figure 4.1: Proposed Project Design (document reference 6.4.F1) and Figure 4.2: Proposed Project Design – Permanent Features (document reference 6.4.F2) shows two underground cable crossings of the River Stour. The LoD and Order Limits have been widened at the crossing of the River Stour to allow for a double crossing or a single crossing (either an eastern only or western only crossing), subject to detailed design of the trenchless crossing methods and detailed ground investigation. The area is constrained by various water bodies, a high-pressure gas main and Source Protection Zone 1. The double crossing would not interact with the Source Protections Zone 1. However, if a single western crossing was taken forwards following detailed design the Project would interact with a Source Protection Zone 1.
13) Black Brooknorth of Langham (Section C)		ES Figure 4.1: Proposed Project Design (document reference 6.4.F1) and Figure 4.2: Proposed Project Design – Permanent Features (document reference 6.4.F2) shows an underground cable alignment to the south of Black Brook. The LoD and Order Limits have been widened slightly to the west of the A12 and south of Black Brook to allow for flexibility of routeing individual cable trenches in the vicinity of existing UKPN underground cables.
14) Great Horkesley south of School Lane (west of Great Horkesley) (Section D)		ES Figure 4.1: Proposed Project Design (document reference 6.4.F1) shows widened LoD and Order Limits to the south of School Lane (west of Great Horkesley) to allow for a wider temporary construction area if required as the underground cable alignment to the west is heavily constrained.

Name of Design Scenario	Image	Description
15) Tilbury North Access at the proposed new Tilbury North Substation (Section H)		ES Figure 4.1: Proposed Project Design (document reference 6.4.F1) and Figure 4.2: Proposed Project Design – Permanent Features (document reference 6.4.F2) present the temporary and permanent access options associated with the new Tilbury North Substation and associated works. The two proposed temporary access options into the new Tilbury North Substation during construction comprise: • A Primary Access Route (PAR) via Stanford Road (east of the Orsett Cock junction), Buckingham Hill Road and Hoford Road leading to a temporary haul road with two alternative alignments: – One running mainly along or alongside Hoford Road before crossing the south-western part of the Clearserve site – One running mainly through the Clearserve site from north-east to south-west • A PAR via Brentwood Road leading to a temporary haul road with alternative alignments with and without LTC in place: – Without LTC: east to west between Brook Farm and Orsett Golf Club using the existing access to the south of High House Lane – With LTC: initially a temporary access road to the west of Brentwood Road, crossing Brentwood Rd and then running east to west between Brook Farm and Orsett Golf Club. On completion of the LTC Brentwood Road bridge embankment works and new junction arrangements with High House Lane, access to the substation would be via Brentwood Road and the new junction with High House Lane and then east between Brook Farm and Orsett Golf Club. • The two proposed access options into the new Tilbury North Substation during operation (and maintenance) comprise: – A permanent new widened access along Hoford Road leading to a permanent private access road with two alternative alignments: ○ One running mainly along or alongside Hoford Road before crossing the south-western part of the Clearserve site ○ One running mainly through the Clearserve site from north-east to south-west – A permanent access running east to west between Brook Farm and Orsett Golf Club. The new NMU route, if provided along Hoford Road during construction, would be retained if the permanent access route runs along Hoford Road.

Name of Design Scenario	Image	Description
16) Thurrock Airfield and Low Heights west of Langdon Hills Golf and Country Club (Section H)		ES Figure 4.1: Proposed Project Design (document reference 6.4.F1) and Figure 4.2: Proposed Project Design – Permanent Features (document reference 6.4.F2) show an alignment between TB238 and TB243. Low height pylons are proposed between TB238 and TB243 to cater for Thurrock Airfield. However, should a housing development be brought forwards at Thurrock Airfield and/or the airfield be closed, low height pylons would not be required and standard lattice pylons would be installed instead.
17) Temporary construction compounds		The ES There are two options for a satellite compound in Basildon, due to a planning application for Brentwood Housing Development (21/01525/OUT) which has yet to be determined. Only one satellite compound would be taken forward depending upon the outcome of the planning application. The two options are: • Option 1) a compound off Brentwood Road, near TB223 (TB-Sate2A) • Option 2) a compound at Lower Dunton Road, near TB233, Basildon (TB-Sate2B).

Name of Design Scenario	Image	Description
		
18) South of the proposed new Tilbury North Substation (Section H)		ES Figure 4.1: Proposed Project Design (document reference 6.4.F1) and Figure 4.2: Proposed Project Design – Permanent Features (document reference 6.4.F2) show to the south of the proposed new Tilbury North Substation alterations to the existing ZB route that comprise amended pylon locations, two proposed new CSE compounds and a section of underground cable between the CSE compounds. In addition, the existing YYJ route is shown with alterations to the locations of existing pylons and new pylons to facilitate a connection into Tilbury North Substation and exiting the new substation to provide the onward connection to the existing Tilbury connection. The LoDs in this location around the underground cable, existing and proposed new locations of YYJ and ZB pylons and the two CSE compounds have been widened to allow flexibility to allow for design refinements due to uncertainties regarding other projects (including Lower Thames Crossing, housing developments and aggregate facilities). There are different forms that this could take with overhead line or cable configurations for the turn in and out of the new Tilbury North Substation with variable positioning of necessary CSE compounds - for example changes may include a double CSE compound arrangement and undergrounding of the YYJ route into the proposed new Tilbury North Substation.

Name of Design Scenario	Image	Description
19) The Walthams and standard lattice to the south of the River Chelmer (Section F)	Low height pylons TB140 to TB142  Standard pylons and one pylon removed TB140 to TB142  	The ES Figure 4.1: Proposed Project Design (document reference 6.4.F1) and Figure 4.2: Proposed Project Design – Permanent Features (document reference 6.4.F2) show pylons TB140, TB141 and TB142 to the south of the River Chelmer as low height pylons. After consideration of feedback during consultations in 2025 certain technical details are being refined which may result in standard lattice pylons to the south of the River Chelmer being installed. Therefore, flexibility has been retained to revert to standard lattice pylons following further technical details being refined – this may also include removing the need for one of the three pylons and a slight change to the locations of the remaining two pylons within the LoD.

2.7 Step 3 – Identification of Potential Effects on European Sites

Study Area

2.7.1 In terms of guidance for linear infrastructure projects, the most appropriate guidance to identify a Study Area comes from DMRB LA 115 Habitats Regulations Assessment (National Highways, 2020a) and Natural England (2021) where screening criteria is included to identify the European Sites that could potentially be affected by the Project. DMRB has been referred to in the absence of other appropriate guidance.

2.7.2 The criteria for identifying a Study Area within the DMRB guidance comprises:

- Is the Project within 2 km of a European Site or functionally linked land?
- Is the Project within 30 km of a SAC, where bats are noted as one of the qualifying interests?
- Does the Project cross or lie adjacent to, upstream of, or downstream of, a watercourse which is designated in part or wholly as a European Site?
- Does the Project have a potential hydrological or hydrogeological linkage to a European Site containing a groundwater dependent terrestrial ecosystem (GWDTE) which triggers the assessment of European Sites in accordance with DMRB LA 113 (National Highways, 2020b)?
- Does the Project have an affected road network[23] which triggers the criteria for assessment of European Sites (DMRB LA 105 (National Highways, 2024))?
- Additional European Sites should be subject to screening where the existence of ecological connectivity between projects and European Sites is identified beyond the screening criteria
- Those European Sites with IRZs within the Project Order Limits should be subject to HRA screening.

2.7.3 IRZs associated with the SSSIs that sit within the European Sites were also considered and discussed with Natural England (as shown within Table 1.1). Following engagement with Natural England it was suggested that (in some cases) FLL with regard to avian species could extend as much as 20 km from the European Site (where geese form a qualifying feature), therefore on a precautionary basis, the first bullet point has been amended to:

- Is the Project within 20 km of a SPA or Ramsar Site (or FLL associated with these sites) with avian qualifying features? The Study Area for SACs remains as 2 km unless bats are noted as a qualifying feature.

2.7.4 The Study Area is shown on Figure 1: European Sites within 20 km of the Order Limits in Appendix C: Figures.

[23] Potential impacts to the existing road network that may arise from the Project, e.g. more traffic due to diversions.

Zone of Influence and Potential Likely Significant Effects

2.7.5 The Zone of Influence (ZoI) is the geographical area around a project in which potential LSEs could occur either directly or indirectly. When defining the ZoI, the potential LSE and the qualifying features of the European Sites that may be affected (together with their associated vulnerabilities) are considered. The ZoI also considers the mobility of qualifying features associated with European Sites that may either use or be reliant on habitat outside of the official designation during their life-cycle (effectively FLL). Therefore, projects that are some distance from a European Site could have potential LSEs.

2.7.6 A desk study covering bird records across the Order Limits has been completed as detailed within the ES Appendix 8.8: Wintering and Passage Bird Report (document reference 6.8.A8). No areas beyond a 5 km IRZ were identified as having notable numbers of geese forming a qualifying feature of a European Site within the Study Area, and as such no pathways to impact beyond 5 km from a European Site are considered to occur.

2.7.7 For the purposes of screening, the extent of the ZoI for each predicted LSE that may occur as a result of the Project is outlined in Table 2.3. This also includes where agreement of a ZoI has been made.

Table 2.3 Zone of influence

ZoI Reference	Potential LSE	ZoI
1	Permanent / temporary land loss (or change of use) - resulting in the loss or degradation of habitat and ultimately flora or fauna.	Within the Order Limits for habitats and species. Includes consideration of potential FLL for European Site avian qualifying features within 5 km of Order Limits.
2	Fragmentation of habitat - reducing connectivity and ultimately species movement.	Within the Order Limits for habitats and species. Includes consideration of potential FLL for European Site avian qualifying features within 5 km of Order Limits.
3	Reduction in species density	Within the Order Limits for habitats and species. Includes consideration of potential FLL for European Site avian qualifying features within 5 km of Order Limits.
4	Disturbance through change in noise, vibration, light and movement - resulting in the disturbance or displacement of species (inclusive of night working).	500 m from the Order Limits. Noting for mobile species associated with European Sites this distance takes into account use of FLL (**agreed with Natural England**).

ZoI Reference	Potential LSE	ZoI
5	Changes in hydrology such as surface and ground water quality - resulting in the loss or degradation of habitat and ultimately impacting flora / fauna.	500 m from Order Limits **agreed with the Environment Agency**. This was extended to 4 km for statutory main rivers downstream of the Order Limits (not applied to smaller watercourses) following consultation with Natural England due to concerns with regards to the River Stour flowing into the Stour and Orwell Estuaries SPA / Ramsar Site.
6	Changes in air quality from dust and vehicle emissions - leading to habitat degradation and ultimately impacting flora / fauna.	200 m from the Order Limits. Noting for mobile species associated with European Sites this distance takes into account use of FLL (**agreed with Natural England**).

2.7.8 Given the length of the Project (approximately 180 km) and the significant size of the Study Area, HRA Stage 1 Screening has been broken down into two phases, 'pre-screening' and 'detailed screening':

- Pre-screening scopes out European Sites where they fall within the Study Area[24] but have no correlation with identified ZoIs. There are no foreseeable impact pathways beyond identified ZoIs and therefore no LSEs are considered to occur outside this area
- Detailed screening focusses on European Sites that overlap with the ZoIs and there is the potential for LSEs due to a clear impact pathway which has been discussed with Natural England.

European Sites Identified Within the Study Area

2.7.9 In total, 28 European Sites were identified within the Study Area (following the DMRB guidance and Natural England's advice), and have been subject to pre-screening. Sites identified are listed in Table 2.4 with their associated citation details and qualifying features presented in Appendix D: Details of European Sites Scoped In. Figure 1: European Sites within 20 km of the Order Limits shows a map of the site locations in Appendix C: Figures.

Table 2.4 European sites within the Study Area

Project Section(s)	Site Name	Designation	Distance and Direction from Nearest Point of the Order Limits
All Sections	Outer Thames Estuary	SPA (marine)	13.8 km east
A	Breckland	SPA	9.7 km west

[24] Study Area is defined as 2 km for SACs, extended to 30 km if bats are a qualifying feature. 2 km for SPAs and Ramsar sites, extended to 20 km if birds are a qualifying feature.

Project Section(s)	Site Name	Designation	Distance and Direction from Nearest Point of the Order Limits
A	Broadland	Ramsar Site	8.9 km north-east
A	Broadland	SPA	8.9 km north-east
A	Norfolk Valley Fens	SAC	0.3 km south-east
B/C	Deben Estuary	Ramsar Site	13.8 km east
B/C	Deben Estuary	SPA	13.8 km east
B/C	Sandlings	SPA	17.9 km east
C	Hamford Water	Ramsar Site	7.9 km east
C	Hamford Water	SPA	7.9 km east
C	Stour and Orwell Estuaries	Ramsar Site	3.1 km east
C	Stour and Orwell Estuaries	SPA	3.1 km east
C/D	Colne Estuary (Mid-Essex Coast Phase 2)	Ramsar Site	7.3 km south-east
C/D	Colne Estuary (Mid-Essex Coast Phase 2)	SPA	7.3 km south-east
D	Abberton Reservoir	Ramsar Site	7.6 km south-east
D	Abberton Reservoir	SPA	7.6 km south-east
D	Dengie (Mid-Essex Coast Phase 1)	Ramsar Site	17.7 km east
D	Dengie (Mid-Essex Coast Phase 1)	SPA	17.7 km east
D/E	Blackwater Estuary (Mid-Essex Coast Phase 4)	Ramsar Site	11.0 km south-east
D/E	Blackwater Estuary (Mid-Essex Coast Phase 4)	SPA	11.0 km south-east
G	Crouch and Roach Estuaries (Mid-Essex Coast Phase 3)	Ramsar Site	12.2 km east
G	Crouch and Roach Estuaries (Mid-Essex Coast Phase 3)	SPA	12.2 km east
H	Benfleet and Southend Marshes	Ramsar Site	11.7 km east
H	Benfleet and Southend Marshes	SPA	11.7 km east
H	Medway Estuary and Marshes	Ramsar Site	12.6 km south-east

Project Section(s)	Site Name	Designation	Distance and Direction from Nearest Point of the Order Limits
H	Medway Estuary and Marshes	SPA	12.6 km south-east
H	Thames Estuary and Marshes	Ramsar Site	1.8 km south-east
H	Thames Estuary and Marshes	SPA	1.8 km south-east

Desk Study and Survey Effort to Determine Functionally Linked Land (FLL)

2.7.10 As defined by Natural England – *'Functionally linked land (FLL) is a term often used to describe areas of land or sea occurring outside a designated site which is considered to be critical to, or necessary for, the ecological or behavioural functions in a relevant season of a qualifying feature for which a Special Area of Conservation (SAC) / Special Protection Area (SPA) / Ramsar site has been designated. These habitats are frequently used by SPA species and supports the functionality and integrity of the designated sites for these features'* (Natural England, 2021).

2.7.11 A desk study and field work have been undertaken to identify potential for FLL (in relation to birds) within proximity to the Project that may be associated with European Sites. Full details are provided in the ES Appendix 8.8: Wintering and Passage Bird Report (document reference 6.8.A8), while a summary of the bird surveys completed, and desk study assessments is provided in Appendix A: Bird Surveys and Desk Study Work.

2.7.12 After reviewing the qualifying features of European Sites within the Study Area, it was determined that due to the mobility of the faunal species listed as qualifying features, birds were the only faunal group likely to rely on land out with the European Site, which had potential to experience a LSE because of the Project. Therefore, investigations into potential FLL were limited to birds.

2.8 Step 4 – Assessing Significance of Effects on European Sites

Pre-Screening

2.8.1 Of the 28[25] sites identified at the pre-screening stage; 23 sites sit outside the identified ZoIs (see Table 2.3) therefore there would be no impact pathways. Therefore, there would be no LSEs on these 23 sites.

2.8.2 The 23 sites that have been screened out at the pre-screening stage comprise:

- Outer Thames Estuary SPA
- Breckland SPA
- Broadland Ramsar Site
- Broadland SPA

[25] Originally 38 sites discussed during consultation with Natural England in September 2023 (see Table 1.) but has been reduced to 28 following design changes.

- Deben Estuary Ramsar Site
- Deben Estuary SPA
- Sandlings SPA
- Hamford Water Ramsar Site
- Hamford Water SPA
- Colne Estuary (Mid-Essex Coast Phase 2) Ramsar Site
- Colne Estuary (Mid-Essex Coast Phase 2) SPA
- Abberton Reservoir Ramsar Site
- Abberton Reservoir SPA
- Dengie (Mid-Essex Coast Phase 1) Ramsar Site
- Dengie (Mid-Essex Coast Phase 1) SPA
- Blackwater Estuary (Mid-Essex Coast Phase 4) Ramsar Site
- Blackwater Estuary (Mid-Essex Coast Phase 4) SPA
- Crouch and Roach Estuaries (Mid-Essex Coast Phase 3) Ramsar Site
- Crouch and Roach Estuaries (Mid-Essex Coast Phase 3) SPA
- Benfleet and Southend Marshes Ramsar Site
- Benfleet and Southend Marshes SPA
- Medway Estuary and Marshes Ramsar Site
- Medway Estuary and Marshes SPA.

Detailed Screening

2.8.3 Five sites have been screened in for detailed screening as they are located within ZoIs. These sites are listed below and the location of the five sites and the associated ZoIs are shown on Figure 2: European Sites Considered for Habitat Regulations Assessment Screening in Appendix C: Figures:

- Norfolk Valley Fens SAC
  - ZoI 5 (Changes in hydrology such as surface and ground water quality) – The SAC is within 300 m of the Order Limits, linked to the SAC by a watercourse. The Project crosses this watercourse 500 m upstream of the SAC and works would take place within this watercourse
- Stour and Orwell Estuaries SPA and Ramsar Site
  - ZoI 1 (Permanent / temporary land loss (or change of use)) – There is potential to affect FLL used by qualifying avian features, situated within the Order Limits and 5 km of the SPA and Ramsar Site
  - ZoI 2 (Fragmentation of habitat) – There is potential to affect qualifying avian features using FLL, situated within the Order Limits and 5 km of the SPA and Ramsar Site. Fragmentation of habitat may include the introduction of overhead line across flyways between the SPA / Ramsar Site and FLL

- ZoI 3 (Reduction in species density) – There is potential to affect qualifying avian features using FLL, situated within the Order Limits and 5 km of the SPA and Ramsar Site. This could be through site clearance works, but the main potential effect is considered to be mortality or injury due to collision with overhead line situated across flyways between the SPA / Ramsar Site and FLL
- ZoI 4 (Disturbance through change in noise, vibration, light and movement) – There is potential to affect qualifying avian features using FLL, situated within the Order Limits and 5 km of the SPA and Ramsar Site
- ZoI 5 (Changes in hydrology such as surface and ground water quality) – The Project crosses the River Stour at two locations. This area of works is hydrologically connected to the SPA / Ramsar Site which is situated approximately 4 km downstream. There is also potential to affect FLL used by qualifying avian features, situated within the Order Limits and 5 km of the SPA and Ramsar Site
- ZoI 6 (Changes in air quality from dust and vehicle emissions) – There is potential to affect FLL used by qualifying avian features, situated within the Order Limits and 5 km of the SPA and Ramsar Site

- Thames Estuary and Marshes SPA and Ramsar Site
  - ZoI 1 (Permanent / temporary land loss (or change of use)) – Although there is no direct overlap with the Order Limits and the SPA / Ramsar Site, there is potential to affect FLL used by qualifying avian features, situated within the Order Limits and 5 km of the SPA and Ramsar Site
  - ZoI 2 (Fragmentation of habitat) – Although there is no direct overlap with the Order Limits and the SPA / Ramsar Site, there is potential to affect FLL used by qualifying avian features, situated within the Order Limits and 5 km of the SPA and Ramsar Site. Fragmentation of habitat may include the introduction of overhead lines across flyways between the SPA / Ramsar Site and FLL
  - ZoI 3 (Reduction in species density) – Although there is no direct overlap with the Order Limits and the SPA / Ramsar Site, there is potential to affect qualifying avian features using FLL, situated within the Order Limits and 5 km of the SPA and Ramsar Site. This could be through site clearance works, but the main potential effect is considered to be mortality or injury due to collision with overhead lines situated across flyways between the SPA / Ramsar Site and FLL
  - ZoI 4 (Disturbance through change in noise, vibration, light and movement) – Although there is no direct overlap with the Order Limits and the SPA / Ramsar Site, there is potential to affect qualifying avian features using FLL, situated within the Order Limits and 5 km of the SPA and Ramsar Site
  - ZoI 5 (Changes in hydrology such as surface and ground water quality) – The Project is hydrologically connected to the SPA / Ramsar Site through a network of drainage ditches. In addition, there is also potential to affect FLL used by qualifying avian features, situated within the Order Limits and 5 km of the SPA and Ramsar Site
  - ZoI 6 (Changes in air quality from dust and vehicle emissions) – Although there is no direct overlap with the Order Limits and the SPA / Ramsar Site,

there is potential to affect FLL used by qualifying avian features, situated within the Order Limits and 5 km of the SPA and Ramsar Site.

Screening Matrices

Notes supporting the Screening Matrices

2.8.4 Screening matrices have been provided for the five sites identified for detailed screening. Separate screening matrices are provided for each of the following sites:

- Norfolk Valley Fens SAC
- Stour and Orwell Estuaries Ramsar Site
- Stour and Orwell Estuaries SPA
- Thames Estuary and Marshes Ramsar Site
- Thames Estuary and Marshes SPA Site.

2.8.5 The screening matrices for these five European Sites are provided in Table 2.5 to Table 2.9.

Matrix Key

✓ = Likely significant effect **cannot** be excluded

X = Likely significant effect can be excluded

C = Construction

O = Operation (and maintenance)

2.8.6 Where applicable, evidence for, or against, LSEs on the European Site and the associated qualifying features is set out in the notes directly below each screening matrix.

Table 2.5 Norfolk Valley Fens SAC

SAC Site Features	Potential for Likely Significant Effects (LSEs)	
	ZoI 5 Changes in hydrology	
Stage of Project	**C**	**O**
Qualifying Habitats – Designated under article 4(4) of the Directive		
Northern Atlantic wet heaths with cross-leaved heath (*Erica tetralix)* for which the area is considered to support a significant presence.	✓[1]	X[2]
European dry heaths for which the area is considered to support a significant presence.	✓[1]	X[2]
Semi-natural dry grasslands and scrubland facies: on calcareous substrates (*Festuco-Brometalia*) for which the area is considered to support a significant presence.	✓[1]	X[2]
Molinia meadows on calcareous, peaty or clayey-silt-laden soils (*Molinion caeruleae*) for which the area is considered to support a significant presence.	✓[1]	X[2]
Calcareous fens with Great fen-sedge (*Cladium mariscus*) and species of the *Caricion davallianae* for which the area is considered to support a significant presence which is considered to be rare as its total extent in the United Kingdom is estimated to be less than 1000 hectares.	✓[1]	X[2]
Alkaline fens for which this is considered to be one of the best areas in the United Kingdom.	✓[1]	X[2]
Alluvial forests with Common Alder (*Alnus glutinosa)* and Common Ash (*Fraxinus excelsior* (*Alno-Padion, Alnion incanae, Salicion albae*)), for which the area is considered to support a significant presence.	✓[1]	X[2]

SAC Site Features	Potential for Likely Significant Effects (LSEs)	
	ZoI 5 **Changes in hydrology**	
Qualifying Species – Designated under article 4(4) of the Directive		
Desmoulin's Whorl snail for which this is considered to be one of the best areas in the United Kingdom.	✓[1]	X[2]
Narrow-mouthed whorl snail for which this is considered to be one of the best areas in the United Kingdom.	✓[1]	X[2]

2.8.7 Screening evidence criteria in support of the above matrix for the Norfolk Valley Fens SAC is provided below.

1) During the construction phase, the haul road and the base of pylon RG24 would be constructed within 50 m of the watercourse that downstream flows adjacent to the Norfolk Valley Fens SAC. In addition, UK Power Network (UKPN) wooden pole lines would need to be undergrounded to avoid conflict with the new 400 kV line; this would involve trenching within 30 m of this watercourse, as well as crossing the watercourse. The stringing of new conductors for the new 400 kV line would directly cross the watercourse. Potential changes in the ground and surface water arising from construction activities may lead to the degradation of habitats within the SAC, and as such effect the species they support. Therefore, the potential for **LSEs cannot be ruled out.**

2) The conductors are proposed to be strung above the watercourse that directly connects to the SAC, there are no foreseeable impact pathways in terms of hydrology on the SAC once operational. The permanent drainage would be designed to achieve discharges at greenfield rates. Therefore, no LSE is considered to occur.

Table 2.6 Stour and Orwell Estuaries Ramsar Site

Ramsar Site Features	Potential for Likely Significant Effects (LSEs)											
	ZoI 1 Permanent / temporary land loss		**ZoI 2** Fragmentation of habitat		**ZoI 3** Reduction in species density		**ZoI 4** Disturbance		**ZoI 5** Changes in hydrology		**ZoI 6** Changes in air quality	
Stage of Development	**C**	**O**	**C**	**O**	**C**	**O**	**C**	**O**	**C**	**O**	**C**	**O**
Ramsar Site criterion 2												
Contains seven nationally scarce plants: stiff saltmarsh-grass (*Puccinellia rupestris)*; small cord-grass (*Spartina maritima)*; perennial glasswort (*Sarcocornia perennis)*; lax-flowered sea lavender (*Limonium humile)*; and the eelgrasses (*Zostera angustifolia*, *Z. marina* and *Z. nolte)*	X[1]	X[2]	X[1]	X[2]	X[1]	X[2]	X[1]	X[2]	✓[3]	X[4]	X[1]	X[2]
Contains five British Red Data Book invertebrates: the muscid fly (*Phaonia fusca)*; the horsefly (*Haematopota grandis)*; two spiders *(Arctosa fulvolineata* and *Baryphema duffeyi)*; and the Endangered swollen spire snail (*Mercuria confusa)*	X[5]	X[2]	X[5]	X[2]	X[5]	X[2]	X[5]	X[2]	✓[3]	X[4]	X[5]	X[2]
Ramsar Site criterion 5 – Assemblages of international importance: Species with peak counts in winter:												
• 63,017 waterfowl (five year peak mean 1998/1999 to 2002/2003)	✓[6]	X[7]	✓[8]	X[9]	X[10]	X[11]	✓[6]	X[7]	✓[3, 6]	X[4]	✓[6]	X[7]
Ramsar Site criterion 6 – Species/populations occurring at levels of international importance. Qualifying Species/populations (as identified at designation): **Species with peak counts in spring/autumn:**												
• Common redshank: 2,588 individuals, representing an average of 2% of the population (five-year peak mean 1995/1996 to 1999/2000)	X[12]	X[12]	X[12]	X[12]	X[10]	X[13]	X[12]	X[12]	✓[3]	X[4]	X[12]	X[12]

Ramsar Site Features	Potential for Likely Significant Effects (LSEs)											
	ZoI 1 Permanent / temporary land loss		**ZoI 2** Fragmentation of habitat		**ZoI 3** Reduction in species density		**ZoI 4** Disturbance		**ZoI 5** Changes in hydrology		**ZoI 6** Changes in air quality	
Stage of Development	**C**	**O**	**C**	**O**	**C**	**O**	**C**	**O**	**C**	**O**	**C**	**O**
Ramsar Site criterion 6 – Species/populations occurring at levels of international importance. Qualifying Species/populations (as identified at designation):												
Species with peak counts in winter:												
• Dark-bellied brent goose: 2,627 individuals, representing an average of 1.2% of the population (five-year peak mean 1995/1996 to1999/2000)	X[12]	X[12]	X[12]	X[12]	X[10]	X[13]	X[12]	X[12]	✓[3]	X[4]	X[12]	X[12]
• Northern pintail, Northwestern Europe: 741 individuals, representing an average of 1.2% of the population (five-year peak mean 1995/1996 to 1999/2000)	X[12]	X[12]	X[12]	X[12]	X[10]	X[13]	X[12]	X[12]	✓[3]	X[4]	X[12]	X[12]
• Grey plover, Eastern Atlantic/ Western Africa – wintering: 3,261 individuals, representing an average of 1.3% of the population (five-year peak mean 1995/1996 to 1999/2000)	X[12]	X[12]	X[12]	X[12]	X[10]	X[13]	X[12]	X[12]	✓[3]	X[4]	X[12]	X[12]
• Red knot, Western and Southern Africa-wintering: 5,970 individuals, representing an average of 1.3% of the population (five-year peak mean 1995/1996 to 1999/2000)	X[12]	X[12]	X[12]	X[12]	X[10]	X[13]	X[12]	X[12]	✓[3]	X[4]	X[12]	X[12]
• Dunlin, Western Siberia/ Western Europe: 19,114 individuals, representing an average of 1.4% of the population (five-year peak mean 1995/1996 to 1999/2000)	X[12]	X[12]	X[12]	X[12]	X[10]	X[13]	X[12]	X[12]	✓[3]	X[4]	X[12]	X[12]

Ramsar Site Features	Potential for Likely Significant Effects (LSEs)											
	ZoI 1 Permanent / temporary land loss		**ZoI 2** Fragmentation of habitat		**ZoI 3** Reduction in species density		**ZoI 4** Disturbance		**ZoI 5** Changes in hydrology		**ZoI 6** Changes in air quality	
Stage of Development	**C**	**O**	**C**	**O**	**C**	**O**	**C**	**O**	**C**	**O**	**C**	**O**
• Black-tailed godwit, Iceland/ Western Europe: 2,559 individuals, representing an average of 7.3% of the population (five-year peak mean 1995/1996 to 1999/2000)	X[12]	X[12]	X[12]	X[12]	X[10]	X[13]	X[12]	X[12]	✓[3]	X[4]	X[12]	X[12]
• Common redshank: 3,687 individuals, representing an average of 2.8% of the population (five-year peak mean 1995/1996 to 1999/2000)	X[12]	X[12]	X[12]	X[12]	X[10]	X[13]	X[12]	X[12]	✓[3]	X[4]	X[12]	X[12]

2.8.8 Screening evidence criteria in support of the above matrix for the Stour and Orwell Estuaries Ramsar Site is provided below.

1) No works are proposed within the Ramsar Site, with the nearest point of the Order Limits situated 3.1 km inland. The nationally scarce plants listed here are saltmarsh species which are likely to be situated further down the catchment towards the estuary mouth within the Ramsar Site. No saltmarsh habitat is present within the Order Limits and therefore, no LSEs are anticipated.

2) There would be no operation (and maintenance) LSEs as the permanent infrastructure and maintenance vehicles routes are situated at least 3.1 km from the Ramsar Site. The qualifying features listed here are likely to be largely confined to the habitats within the Ramsar Site and those within the close vicinity.

3) The River Stour flows through the Order Limits at two locations where the main 400 kV overhead line is proposed approximately 5.5 km upstream of the Ramsar Site. Trenchless crossings of the River Stour are proposed at these two locations, while three Temporary Attenuation Drainage (TAD) ponds are proposed to drain into the river, with a fourth draining into Langham Lake which connects to the river when flooded. Therefore, in the absence of mitigation, hydrological **LSEs on the habitats present (and as such, all the qualifying features they support) cannot be screened out.**

4) There are no anticipated changes in surface or ground water quality during the operation (and maintenance) phase as there would be no permanent discharge of water. All draining requirements would be designed to achieve discharges at greenfield rates. Therefore, no operation (and maintenance) LSEs with regards to hydrology are considered to occur.

5) No works are proposed within the Ramsar Site, with the nearest point of the Order Limits situated 3.1 km inland. The British Red Data Book invertebrates listed here are saltmarsh / tidal river / brackish marsh species which are likely to be largely confined within the Ramsar Site and habitats in the close vicinity. No such habitats are present within the Order Limits and therefore, no LSEs are anticipated.

6) The Order Limits are situated approximately 3.1 km from the Ramsar Site. Two areas situated within the Order Limits and 5 km of the Ramsar Site have been identified as FLL with respect to lapwing and golden plover (shown on Figure A8.8.17 of ES Appendix 8.8: Wintering and Passage Bird Report (document reference 6.8.A8)) which are part of the waterbird assemblage qualifying feature. Works in these areas include installing the proposed underground cable which requires a 120 m wide excavation and working area (combined) as well as compounds and TAD ponds. Therefore, in the absence of mitigation, LSEs within the relevant ZoI of the FLL, cannot be screened out. **LSEs on waterbird assemblage species cannot be screened out.**

7) Underground cable is proposed through FLL (for lapwing and golden plover which are part of the waterbird assemblage). Habitats would be restored here on completion of the works and therefore no loss of FLL would occur during the operation (and maintenance) phase and no above ground infrastructure would exist which requires maintenance. Therefore, no LSEs within the relevant ZoI are considered to occur.

8) The proposed construction works outlined in Point 6 also have the potential to split and fragment the FLL identified for waterbird assemblage species (lapwing and golden plover). Therefore, construction LSEs with respect to habitat fragmentation cannot be screened out. **LSEs on waterbird assemblage species cannot be screened out.**

9) The proposed installation of underground cable where it passes through FLL and habitats would be restored here on completion of the works, therefore the fragmentation described in Point 8 would not continue into the operation (and maintenance) phase. A new 400 kV overhead line is proposed west from the Ardleigh Substation (through Survey Location 10), crossing Ardleigh Reservoir (surveyed from a VP at Survey Location 11); this stretch of overhead line is within 5 km of the Ramsar Site. Fragmentation caused by introducing a potential dispersal barrier (the overhead line) therefore needs to be considered. FLL for lapwing and golden plover (part of the waterbird assemblage qualifying feature) has been identified within Survey Location 10. The overhead line would be situated approximately 1 km south of the FLL and would not be situated between the Ramsar Site and the FLL. Surveys at VP 11 (see Appendix A: Bird Surveys and Desk Study Work, of this report, and ES Appendix 8.8: Wintering and Passage Bird Report (document reference 6.8.A8) did not record lapwing and golden plover, and although cormorant was recorded (also part of the waterbird assemblage qualifying feature), this comprised single birds in flight recorded on just eight occasions (insignificant numbers). Therefore, no LSE with regard to habitat fragmentation on this qualifying feature is considered to occur.

10) The Ramsar Site avian qualifying features only include wintering birds. Birds during the non-breeding season are likely to be flushed before clearance works commence in a localised area, and as such, mortality or injury is considered extremely unlikely and no LSE with respect to construction mortality is considered to occur.

11) As described in Point 9, a new 400 kV overhead line is proposed within 5 km of the Ramsar Site. Fragmentation was discussed in Point 9, but mortality through collision risk also needs to be considered. VP 11 was designed to assess the collision risk of waterbirds with this proposed line, as it targeted bird species flying in and out of Ardleigh Reservoir which is a large waterbody within 5 km of the Ramsar Site, and as such, was identified as having potential to attract waterbirds associated with the Ramsar Site. The only waterbird assemblage species recorded during this survey work was cormorant and observations comprised single birds in flight on just eight occasions, with an insignificant amount of time at collision risk height. Therefore, no operation (and maintenance) LSE with regards to reduction in species density is considered to occur.

12) No FLL for this qualifying feature was recorded within the Order Limits for the main 400 kV overhead line and significant numbers of this species were not recorded during survey work. In addition, the Ramsar Site where this qualifying feature is likely to be present is situated 3.1 km from the proposed 400 kV overhead line. Therefore, no construction or operation (and maintenance) LSEs are considered to occur along the 400 kV overhead line within the relevant ZoI for this qualifying feature.

13) This qualifying feature was not recorded during survey work to determine collision risk of the proposed overhead line within 5 km of the Ramsar Site. Therefore, no operation (and maintenance) LSE with regards to reduction in species density is considered to occur.

Table 2.7 Stour and Orwell Estuaries SPA

SPA Site Features	Potential for Likely Significant Effects (LSEs)											
	Zol 1 Permanent / temporary land loss		**Zol 2** Fragmentation of habitat		**Zol 3** Reduction in species density		**Zol 4** Disturbance		**Zol 5** Changes in hydrology		**Zol 6** Changes in air quality	
Stage of Development	**C**	**O**	**C**	**O**	**C**	**O**	**C**	**O**	**C**	**O**	**C**	**O**
Article 4.1 Qualification (79/409/EEC) **During the breeding season the area regularly supports:**												
• Pied avocet, Western Europe/ Western Mediterranean – breeding: 3.6% of the population in Great Britain five-year peak mean 1996 to 2000	X[1]	X[2]	X[1]	X[2]	X[1]	X[2]	X[1]	X[2]	✓[3]	X[4]	X[1]	X[2]
Article 4.2 Qualification (79/409/EEC) **Over winter the area regularly supports:**												
• Northern pintail, North-western Europe: 1.2% of the population five-year peak mean 1995/1996 to 1999/2000	X[5]	X[5]	X[5]	X[5]	X[6]	X[7]	X[5]	X[5]	✓[3]	X[4]	X[5]	X[5]
• Brent goose, Western Siberia/ Western Europe: 1.2% of the population five-year peak mean 1995/1996 to 1999/2000	X[5]	X[5]	X[5]	X[5]	X[6]	X[7]	X[5]	X[5]	✓[3]	X[4]	X[5]	X[5]
• Dunlin, Northern Siberia/ Europe/ Western Africa: 1.4% of the population five-year peak mean 1995/1996 to 1999/2000	X[5]	X[5]	X[5]	X[5]	X[6]	X[7]	X[5]	X[5]	✓[3]	X[4]	X[5]	X[5]
• Red knot, North-eastern Canada/ Greenland/ Iceland/ North-western Europe: 1.3% of the population five-year peak mean 1995/1996 to 1999/2000	X[5]	X[5]	X[5]	X[5]	X[6]	X[7]	X[5]	X[5]	✓[3]	X[4]	X[5]	X[5]

SPA Site Features	Potential for Likely Significant Effects (LSEs)											
	Zol 1 Permanent / temporary land loss		Zol 2 Fragmentation of habitat		Zol 3 Reduction in species density		Zol 4 Disturbance		Zol 5 Changes in hydrology		Zol 6 Changes in air quality	
Stage of Development	**C**	**O**	**C**	**O**	**C**	**O**	**C**	**O**	**C**	**O**	**C**	**O**
• Black-tailed godwit, Iceland – breeding: 7.3% of the population five-year peak mean 1995/1996 to 1999/2000	X[5]	X[5]	X[5]	X[5]	X[6]	X[7]	X[5]	X[5]	✓[3]	X[4]	X[5]	X[5]
• Grey plover, Eastern Atlantic – wintering: 1.3% of the population five-year peak mean 1995/1996 to 1999/2000	X[5]	X[5]	X[5]	X[5]	X[6]	X[7]	X[5]	X[5]	✓[3]	X[4]	X[5]	X[5]
• Common Redshank, Eastern Atlantic – wintering: 2.8% of the population five-year peak mean 1995/1996 to 1999/2000	X[5]	X[5]	X[5]	X[5]	X[6]	X[7]	X[5]	X[5]	✓[3]	X[4]	X[5]	X[5]
Article 4.2 Qualification (79/409/EEC): An Internationally Important Assemblage Of Birds Over winter the area regularly supports:												
63,017 waterfowl (five-year peak mean 1991/1992 to 1995/1996) Including: great crested grebe, great cormorant, brent goose, shelduck, Eurasian wigeon, gadwall, northern pintail, common goldeneye, common ringed plover, grey plover, northern lapwing, red knot, dunlin, black-tailed godwit, curlew, common redshank, turnstone	✓[8]	X[9]	✓[10]	X[11]	X[6]	X[12]	✓[8]	X[9]	✓[3, 8]	X[4]	✓[8]	X[9]

2.8.9 Screening evidence criteria in support of the above matrix for the Stour and Orwell Estuaries SPA is provided below.

1) Breeding avocet prefer to nest in the open on bare, muddy islands (Gilbert *et al*. 1998). No habitat for breeding avocet has been noted within the Order Limits and breeding bird surveys along the proposed underground cabling area within 5 km of the SPA did not record this species. Therefore, no construction LSEs are considered to occur within the relevant ZoI.

2) No avocet breeding habitat is present within Order Limits and the SPA (where breeding avocet are likely to be concentrated) is situated 3.1 km away. Therefore, no operation (and maintenance) LSEs are considered to occur within the relevant ZoI.

3) The River Stour flows through the Order Limits at two locations where the main 400 kV overhead line is proposed approximately 4 km upstream of the SPA. Trenchless crossings of the River Stour are proposed at these two locations, while three TAD ponds are proposed to drain into the river, with a fourth draining into Langham Lake which connects to the river when flooded. Therefore, in the absence of mitigation, hydrological **LSEs on the habitats present (and as such, all the qualifying features they support) cannot be screened out.**

4) There are no anticipated changes in surface or ground water quality during the operation (and maintenance) phase as there would be no permanent discharge of water. All draining requirements would be designed to achieve discharges at greenfield rates. Therefore, no operation (and maintenance) LSEs with regards to hydrology are considered to occur.

5) No FLL for this qualifying feature was recorded within the Order Limits and significant numbers of this species were not recorded during survey work. In addition, the SPA where this qualifying feature is likely to be present is situated 3.1 km from the Order Limits. Therefore, no construction or operation (and maintenance) LSEs are considered to occur within the relevant ZoI for this qualifying feature.

6) This SPA qualifying feature is for passage / wintering bird numbers. Birds during the non-breeding season are likely to be flushed before clearance works commence in a localised area, and as such, mortality or injury is considered extremely unlikely and no LSE with respect to construction mortality is considered to occur.

7) A new 400 kV overhead line is proposed west from the Ardleigh Substation (through Survey Location 10), crossing Ardleigh Reservoir (surveyed from a VP at Survey Location 11); this stretch of overhead line is within 5 km of the SPA. Mortality through collision risk is therefore considered here. VP 11 was designed to assess the collision risk of waterbirds with this proposed line, as it targeted bird species flying in and out of Ardleigh Reservoir which is a large waterbody within 5 km of the SPA, and as such, was highlighted as having potential to attract waterbirds associated with the SPA. This qualifying feature was not recorded during the survey work (see Appendix A: Bird Surveys and Desk Study Work, of this report, and ES Appendix 8.8: Wintering and Passage Bird Report (document reference 6.8.A8)) to determine collision risk and therefore no operation (and maintenance) LSE with regards to reduction in species density is considered to occur.

8) The Order Limits are situated approximately 3.1 km from the SPA. Two areas within the Order Limits and 5 km of the SPA have been identified as FLL with respect to lapwing and golden plover (shown on Figure A8.8.17 of ES Appendix 8.8: Wintering and Passage Bird Report (document reference 6.8.A8)) which are part of the waterbird assemblage qualifying feature. Works in these areas include the proposed installation of underground cable which requires a 120 m wide excavation and working area (combined) as well as compounds and TAD ponds. Therefore, in the absence of mitigation, LSEs within the relevant ZoI of the FLL, cannot be screened out. **LSEs on waterbird assemblage species cannot be screened out**.

9) Underground cabling is proposed where the 400 kV overhead line passes through FLL (for lapwing and golden plover which are part of the waterbird assemblage). Habitats would be restored here on completion of the works and therefore no loss of FLL would occur during the operation (and maintenance) phase and no above ground infrastructure would exist which requires maintenance. No LSEs within the relevant ZoI are considered to occur.

10) The proposed construction works outlined in Point 8 also have the potential to split and fragment the FLL identified for waterbird assemblage species (lapwing and golden plover). Therefore, construction LSEs with respect to habitat fragmentation cannot be screened out. **LSEs on waterbird assemblage species cannot be screened out.**

11) The proposed installation of underground cable where it passes through FLL and habitats would be restored on completion of the works, therefore the fragmentation described in Point 10 would not continue into the operation (and maintenance) phase. As described in Point 7, a new 400 kV overhead line is proposed within 5 km of the SPA. Fragmentation caused by introducing a potential dispersal barrier (the overhead line) therefore needs to be considered. FLL for lapwing and golden plover (part of the waterbird assemblage qualifying feature) has been identified within Survey Location 10. The overhead line is situated approximately 1 km south of the FLL and is not situated between the SPA and the FLL. Surveys at VP 11 did not record lapwing and golden plover, and although cormorant was recorded (also part of the waterbird assemblage qualifying feature), this comprised single birds in flight recorded on just eight occasions (insignificant numbers). Therefore, no LSE with respect to habitat fragmentation on this qualifying feature is considered to occur.

12) As described in Point 7, a new 400 kV overhead line is proposed within 5 km of the SPA. Fragmentation was discussed in Point 11, but mortality through collision risk also needs to be considered. As described previously, VP 11 was designed to assess the collision risk of waterbirds with this proposed line. The only waterbird assemblage species recorded during this survey work was cormorant and observations comprised single birds in flight on just eight occasions, with an insignificant amount of time at collision risk height. Therefore, no operation (and maintenance) LSE with regards to reduction in species density is considered to occur.

Table 2.8 Thames Estuary and Marshes Ramsar Site

Ramsar Site Features	Potential for Likely Significant Effects (LSEs)											
	Zol 1 Permanent / temporary land loss		**Zol 2** Fragmentation of habitat		**Zol 3** Reduction in species density		**Zol 4** Disturbance		**Zol 5** Changes in hydrology		**Zol 6** Changes in air quality	
Stage of Development	**C**	**O**	**C**	**O**	**C**	**O**	**C**	**O**	**C**	**O**	**C**	**O**
Ramsar Site criterion 2												
The site supports more than 20 British Red Data Book invertebrates and populations of the Great Britain Red Book endangered least lettuce *(Lactuca saligna*), as well as the vulnerable slender hare's-ear, divided sedge (*Carex divisa*), sea barley (*Hordeum marinum*), Borrer's saltmarsh-grass (*Puccinellia fasciculata*), and dwarf eelgrass (*Zostera noltei*).	X[1]	X[1]	X[1]	X[1]	X[1]	X[1]	X[1]	X[1]	X[2]	X[3]	X[1]	X[1]
Ramsar Site criterion 5 – Assemblages of international importance: **Species with peak counts in winter:**												
45,118 waterfowl (five-year peak mean 1998/1999 to 2002/2003)	X[4]	X[4]	X[4]	X[5]	X[4]	X[5]	X[4]	X[4]	X[2]	X[3]	X[4]	X[4]
Ramsar Site criterion 6 – Species/populations occurring at levels of international importance. Qualifying Species/populations (as identified at designation): **Species with peak counts in spring/autumn:**												
Ringed plover (*Charadrius hiaticula*), Europe/ North-west Africa: 595 individuals, representing an average of 1.8% of the Great Britain population (five-year peak mean 1998/1999 to 2002/2003)	X[4]	X[4]	X[4]	X[5]	X[4]	X[5]	X[4]	X[4]	X[2]	X[3]	X[4]	X[4]

Ramsar Site Features	Potential for Likely Significant Effects (LSEs)											
	Zol 1 Permanent / temporary land loss		Zol 2 Fragmentation of habitat		Zol 3 Reduction in species density		Zol 4 Disturbance		Zol 5 Changes in hydrology		Zol 6 Changes in air quality	
Stage of Development	**C**	**O**	**C**	**O**	**C**	**O**	**C**	**O**	**C**	**O**	**C**	**O**
Black-tailed godwit (*Limosa limosa*) Iceland/ Western Europe: 1,640 individuals, representing an average of 4.6% of the population (five-year peak mean 1998/1999 to 2002/2003)	X[4]	X[4]	X[4]	X[5]	X[4]	X[5]	X[4]	X[4]	X[2]	X[3]	X[4]	X[4]
Ramsar Site criterion 6 – Species/populations occurring at levels of international importance. Qualifying Species/populations (as identified at designation): **Species with peak counts in winter:**												
Grey plover (*Pluvialis squatarola*), Eastern Atlantic/ Western Africa - wintering: 1,643 individuals, representing an average of 3.1% of the Great Britain population (five-year peak mean 1998/1999 to 2002/2003)	X[4]	X[4]	X[4]	X[5]	X[4]	X[5]	X[4]	X[4]	X[2]	X[3]	X[4]	X[4]
Red knot (*Calidris canutus*), Western and Southern Africa - wintering: 7,279 individuals, representing an average of 1.6% of the population (five-year peak mean 1998/1999 to 2002/2003)	X[4]	X[4]	X[4]	X[5]	X[4]	X[5]	X[4]	X[4]	X[2]	X[3]	X[4]	X[4]
Dunlin (*Calidris alpina alpina*), Western Siberia/ Western Europe: 15,171 individuals, representing an average of 1.1% of the population (five-year peak mean 1998/1999 to 2002/2003)	X[4]	X[4]	X[4]	X[5]	X[4]	X[5]	X[4]	X[4]	X[2]	X[3]	X[4]	X[4]
Common redshank (*Tringa totanus totanus*): 1,178 individuals, representing an average of 1% of the Great Britain population (five-year peak mean 1998/1999 to 2002/2003)	X[4]	X[4]	X[4]	X[5]	X[4]	X[5]	X[4]	X[4]	X[2]	X[3]	X[4]	X[4]

2.8.10 Screening evidence criteria in support of the above matrix for the Thames Estuary and Marshes Ramsar Site is provided below.

1) There are no works proposed within the Thames Estuary and Marshes Ramsar Site which is situated approximately 1.7 km from the Order Limits. Both the invertebrate and plant species that make up the qualifying features of the Ramsar Site are non-mobile or restricted to the supporting habitat within the Ramsar Site. The distribution of qualifying features is not likely to extend far from the designated site boundaries. No suitable supporting habitat is present within the Order Limits. Therefore, no construction or operation (and maintenance) LSEs in the relevant ZoI are considered to occur.

2) The Order Limits do not contain any habitat considered FLL for qualifying features of the Thames Estuary and Marshes Ramsar Site. Although ditches are present through the Order Limits which could be indirectly connected to the Thames Estuary, the closest point of the Order Limits is approximately 1.7 km from the Ramsar Site. Therefore, this is well outside the ZoI for water quality effects from small waterways and no construction LSE with respect to hydrology is considered to occur.

3) There are no anticipated changes in surface or ground water quality during the operation (and maintenance) phase as there would be no permanent discharge of water. All draining requirements would be designed to achieve discharges at greenfield rates. Therefore, no operation (and maintenance) LSEs with regards to hydrology are considered to occur.

4) There are no works proposed within the Thames Estuary and Marshes Ramsar Site, but the Order Limits do fall within 5 km of the Ramsar Site (ZoI for avian qualifying features) with the closest point approximately 1.7 km away. Passage and wintering bird surveys aimed at suitable habitat within the Order Limits and the close vicinity for Ramsar qualifying avian features, did not record significant numbers of these birds, and as such, no FLL was considered present within the Order Limits (see Appendix A: Bird Surveys and Desk Study Work, of this report, and ES Appendix 8.8: Wintering and Passage Bird Report (document reference 6.8.A8)). Desk study results suggest the main concentrations of these birds are within close proximity to the Ramsar Site and adjoining estuarine / wetland habitats which are over 1 km from the Order Limits. No LSEs are considered to occur within the relevant ZoI.

5) Although no FLL is present within the Order Limits, the presence of new overhead line being introduced north of the proposed new Tilbury North Substation may cause operational fragmentation of habitat by introducing dispersal barriers between the Ramsar Site and FLL within a wider area, as well as a risk of mortality through collision. However, there are already extensive overhead lines from Tilbury Substation to the north, where it splits in the vicinity of Orsett Golf Course (where the new substation is proposed); therefore, extensive dispersal barriers already exist in this area. The proposals south of the new substation primarily involve replacement / adjustments / minor re-routing of existing lines. A new short stretch of cable is proposed connecting the overhead lines into the new substation, but existing lines in this area would be undergrounded to allow this, and therefore an increase in the number of overhead cables would not occur. As such no additional fragmentation or collision threat is considered to occur. The only Ramsar Site avian feature recorded overhead during wintering / passage bird surveys was lapwing (part of the waterbird assemblage qualifying feature), which were recorded at Survey Location 21 and 22 i.e., at the location of the existing overhead line New overhead lines are proposed

north of the new substation, but no Ramsar Site avian features were recorded during surveys at Survey Location 19 (in the vicinity of the start of this new line). No 'green corridors' (i.e. waterway corridors used to select VP locations as they likely provide avian commuting routes) are present within the ZoI north of this location and desk study data shows few Ramsar Site avian feature records north of this point also. Therefore, no LSEs associated with operational fragmentation and risk of mortality is considered to occur.

Table 2.9 Thames Estuary and Marshes SPA

SPA Site Features	Potential for Likely Significant Effects (LSEs)											
	ZoI 1 Permanent / temporary land loss		ZoI 2 Fragmentation of habitat		ZoI 3 Reduction in species density		ZoI 4 Disturbance		ZoI 5 Changes in hydrology		ZoI 6 Changes in air quality	
Stage of Development	**C**	**O**	**C**	**O**	**C**	**O**	**C**	**O**	**C**	**O**	**C**	**O**
Article 4.1 Qualification (79/409/EEC) Over winter the area regularly supports:												
Hen harrier: 1% of the population in Great Britain five-year peak mean for 1993/1994 to 1997/1998	X[1]	X[1]	X[1]	X[2]	X[1]	X[2]	X[1]	X[1]	X[3]	X[4]	X[1]	X[1]
Pied avocet, Western Europe/ Western Mediterranean – breeding: 28.3% of the population in Great Britain five-year peak mean for 1993/1993 to 1997/1998	X[1]	X[1]	X[1]	X[2]	X[1]	X[2]	X[1]	X[1]	X[3]	X[4]	X[1]	X[1]
Article 4.2 Qualification (79/409/EEC) Over winter the area regularly supports:												
Dunlin, Northern Siberia/ Europe/ Western Africa: 2.1% of the population five-year peak mean for 1993/1994 to 1997/1998	X[1]	X[1]	X[1]	X[2]	X[1]	X[2]	X[1]	X[1]	X[3]	X[4]	X[1]	X[1]
Red knot, North-eastern Canada/ Greenland/ Iceland/ North-western Europe: 1.4% of the population five-year peak mean for 1993/1994 to 1997/1998	X[1]	X[1]	X[1]	X[2]	X[1]	X[2]	X[1]	X[1]	X[3]	X[4]	X[1]	X[1]

SPA Site Features	Potential for Likely Significant Effects (LSEs)											
	Zol 1 Permanent / temporary land loss		Zol 2 Fragmentation of habitat		Zol 3 Reduction in species density		Zol 4 Disturbance		Zol 5 Changes in hydrology		Zol 6 Changes in air quality	
Stage of Development	**C**	**O**	**C**	**O**	**C**	**O**	**C**	**O**	**C**	**O**	**C**	**O**
Black-tailed godwit, Iceland – breeding: 2.4% of the population five-year peak mean for 1993/1994 to 1997/1998	X[1]	X[1]	X[1]	X[2]	X[1]	X[2]	X[1]	X[1]	X[3]	X[4]	X[1]	X[1]
Grey plover, Eastern Atlantic – wintering: 1.7% of the population five-year peak mean for 1993/1994 to 1997/1998	X[1]	X[1]	X[1]	X[2]	X[1]	X[2]	X[1]	X[1]	X[3]	X[4]	X[1]	X[1]
Common redshank, Eastern Atlantic – wintering: 2.2% of the population five-year peak mean for 1993/1994 to 1997/1998	X[1]	X[1]	X[1]	X[2]	X[1]	X[2]	X[1]	X[1]	X[3]	X[4]	X[1]	X[1]
Article 4.2 Qualification (79/409/EEC) On passage the area regularly supports:												
Common ringed plover, Europe/Northern Africa – wintering: 2.6% of the population five-year peak mean for 1993/94 to 1997/98	X[1]	X[1]	X[1]	X[2]	X[1]	X[2]	X[1]	X[1]	X[3]	X[4]	X[1]	X[1]
Article 4.2 Qualification (79/409/EEC): An internationally important assemblage of birds. Over winter the area regularly supports:												
75,019 waterfowl (five-year peak mean 21/03/2000), including: pied avocet, grey plover, red knot, dunlin, black-tailed godwit and the common redshank	X[1]	X[1]	X[1]	X[2]	X[1]	X[2]	X[1]	X[1]	X[3]	X[4]	X[1]	X[1]

2.8.11 Screening evidence criteria in support of the above matrix for the Thames Estuary and Marshes SPA is provided below.

1) There are no works proposed within the Thames Estuary and Marshes SPA, but the Order Limits do fall within 5 km of the SPA (ZoI for avian qualifying features) with the closest point approximately 1.7 km away. Passage and wintering bird surveys aimed at suitable habitat within the Order Limits and the close vicinity for SPA qualifying features, did not record significant numbers of these birds, and as such, no FLL was considered present within the Order Limits (see Appendix A: Bird Surveys and Desk Study Work, of this report, and ES Appendix 8.8: Wintering and Passage Bird Report (document reference 6.8.A8)). Desk study results suggest the main concentrations of these birds are within close proximity to the SPA and adjoining estuarine / wetland habitats which are over 1 km from the Order Limits. No LSEs are considered to occur within the relevant ZoI.

2.8.12 Although no FLL is present within the Order Limits, the presence of new overhead line being introduced north of the proposed new Tilbury North Substation may cause operational fragmentation of habitat by introducing potential dispersal barriers between the SPA and FLL within a wider area, as well as a risk of mortality through collision. However, there are already extensive overhead lines from Tilbury Substation to the north, where it splits in the vicinity of Orsett Golf Course (where the new substation is proposed); therefore, extensive barriers to dispersal already exist in this area. The proposals south of the new substation primarily involve replacement / adjustments / minor re-routing of existing lines. A new short stretch of cable is proposed connecting the overhead lines into the new substation, but existing lines in this area would be undergrounded to allow this, and therefore an increase in the number of overhead cables would not occur. As such, no additional fragmentation or collision threat is considered to occur. The only SPA qualifying feature recorded overhead during wintering / passage bird surveys was lapwing (part of the waterbird assemblage qualifying feature), which were recorded at Survey Location 21 and 22 i.e., at the location of the existing overhead line. New overhead lines are proposed north of the new substation, but no SPA avian features were recorded during surveys at Survey Location 19 (in the vicinity of the start of this new line). No ‘green corridors’ (i.e. waterway corridors used to select VP locations as they likely provide avian commuting routes) are present within the ZoI north of this location and desk study data shows few SPA avian feature records north of this point also. No LSEs associated with operational fragmentation and risk of mortality are considered to occur.

1) The Order Limits do not contain any habitat considered FLL for qualifying features of the Thames Estuary and Marshes SPA. Although ditches are present through the Order Limits which could be indirectly connected to the Thames Estuary, the closest point of the Order Limits is approximately 1.7 km from the SPA. This is well outside the ZoI for water quality effects from small waterways and no construction LSEs with respect to hydrology are considered to occur.

2) There are no anticipated changes in surface or ground water quality during the operation (and maintenance) phase as there would be no permanent discharge of water. All draining requirements would be designed to achieve discharges at greenfield rates. Therefore, no operation (and maintenance) LSEs with regards to hydrology are considered to occur.

In-Combination Effects

2.8.13 In accordance with the Advice Page - Nationally Significant Infrastructure Project: Advice on Habitats Regulations Assessments (Planning Inspectorate, 2025), the following plans / projects have been considered for the HRA in-combination assessment at Stage 1 Screening:

- Projects that are under construction
- Permitted application(s) not yet implemented
- Submitted application(s) not yet determined
- All refusals subject to appeal procedures not yet determined
- Projects on the Planning Inspectorate's National Infrastructure Programme of Projects
- Projects identified in the relevant development plan (and emerging development plans – with appropriate weight being given as they move closer to adoption) recognising that much information on any relevant proposals will be limited and the degree of uncertainty which may be present.

2.8.14 When identifying plans or projects that meet the above criteria, ES Appendix 17.2: Long List and Short List of Other Developments (document reference 6.17.A2) has been reviewed. The ES appendix outlines the long list of other developments that have been considered as part of the assessment within the ES (Volume 6 of the DCO application). The long list of developments presented in Tables A17.1.1 to A17.1.14 are also relevant in the context of identifying in-combination effects as part of the HRA.

2.8.15 For this HRA, only projects that were located within the IRZ of a European Site and also fell within the ZoI (as listed in Table 2.3) were considered in the in-combination assessment at Stage 1 Screening. The nature of the plans or projects was also considered when determining the potential for an in-combination effect which ruled out in-combination effects for most small projects and local plan site allocations.

2.8.16 When considering a potential in-combination effect at screening, due to the discreet impact pathways associated with the Project, the risk of in-combination effects with other plans or projects such as residential projects and employment land allocations was considered negligible. Therefore, the in-combination effects screening focussed on other linear and energy transmission projects.

2.8.17 Nine projects were identified, and agreed with Natural England, that may change the outcome of the screening when considering in-combination effects on European Sites. They comprised:

- Bramford to Twinstead
- Five Estuaries Offshore Wind Farm
- North Falls Offshore Wind Farm
- A12 Chelmsford to A120 Widening Project
- East Anglia Three
- Lower Thames Crossing

- Thurrock Flexible Generation Plant
- Tilbury to Grain and Tilbury to Kingsnorth (TRKE)
- Tilbury 3.

Bramford to Twinstead

2.8.18 The Bramford to Twinstead project comprises the construction and operation (and maintenance) of a new double circuit electricity transmission network reinforcement of c.29 km, consisting of overhead lines, underground cables, a grid supply point substation and associated development.

2.8.19 Consent for the project was granted in September 2024 with construction work already started on the grid supply point substation at Butler's Wood with full construction expected to accelerate throughout 2025. The construction period of the Project and Bramford to Twinstead is likely to overlap between 2027 and 2028, with the projects directly overlapping at Bramford Substation. The Stage 1 – Screening section within the HRA for Bramford to Twinstead (National Grid, 2024) has been reviewed to determine the potential for in-combination effects.

2.8.20 Potential pathways to hydrological pollution effects with regards to the Stour and Orwell Estuaries SPA and Ramsar Site were identified. This was due to a trenchless crossing of the River Stour, as well as culverted access crossings, and construction of above ground infrastructure within the River Stour catchment. There is the potential for 'in combination' effects on the qualifying features of the Stour and Orwell Estuaries SPA and Ramsar Site.

2.8.21 Therefore, likely significant in-combination effects with the Bramford to Twinstead Project cannot be ruled out at Stage 1 – Screening and as such, is discussed in Stage 2 – Appropriate Assessment.

Five Estuaries Offshore Wind Farm

2.8.22 The Five Estuaries Offshore Wind Farm project is an offshore wind farm with associated infrastructure. Onshore elements of the project include underground cabling, transition and jointing bays, an onshore substation and connection infrastructure to the EACN Substation.

2.8.23 As of June 2025, the project was at the decision stage, following the conclusion of the examination in March 2025. When comparing with the Norwich to Tilbury Project, there is an overlap in Order Limits, when connecting to the new EACN Substation and overlapping construction programmes, 2027 to 2030. The Habitats Regulations Assessment Screening Matrices and Report to Inform Appropriate Assessment for the Five Estuaries Offshore Wind Farm as well as the Stage 2 - Appropriate Assessment have been reviewed to determine the potential for in-combination effects.

2.8.24 The HRA Screening report identified potential likely significant effects on the Stour and Orwell Estuaries SPA and Ramsar Site avian features through; loss of foraging and roosting habitat outside the SPA / Ramsar, disturbance / displacement of birds outside SPA, pollution from site run-off affecting prey availability, decreases in water quality and decrease in air quality. The only pathways to impacts within the ZoI of the Norwich to Tilbury Project, that could cause a likely significant in-combination effect is construction works at the new EACN Substation connection which may lead to habitat loss and disturbance to lapwing (a waterbird assemblage species) using

potential FLL outside the SPA and Ramsar Site. The Norwich to Tilbury Project is listed as having a potential in-combination effect for this reason at the screening stage of the Five Estuaries HRA.

2.8.25 Therefore, likely significant in-combination effects with the Five Estuaries Offshore Wind Farm Project cannot be ruled out at Stage 1 – Screening and as such, is discussed in Stage 2 – Appropriate Assessment.

North Falls Offshore Wind Farm

2.8.26 The North Falls Offshore Wind Farm project would principally comprise offshore wind turbines together with associated infrastructure (onshore and offshore) including a connection to the electricity transmission network and the new EACN Substation.

2.8.27 As of July 2025, the application was at the examination stage. When comparing with the Norwich to Tilbury Project, there is an overlap in Order Limits, when connecting to the new EACN Substation and overlapping construction programmes, 2027 to 2030. The Habitats Regulations Assessment Screening report for the North Falls Offshore Wind Farm has been reviewed to determine the potential for in-combination effects.

2.8.28 Similarly to the Five Estuaries Offshore Wind Farm, the screening report concludes the Stour and Orwell Estuaries SPA and Ramsar Site are within the potential ZoI for effects to FLL habitats and disturbance to qualifying features using FLL. It also lists the Norwich to Tilbury Project as falling within their search area for in-combination effects.

2.8.29 Therefore, likely significant in-combination effects with the North Falls Offshore Wind Farm Project cannot be ruled out at Stage 1 – Screening and as such, is discussed in Stage 2 – Appropriate Assessment.

A12 Chelmsford to A120 Widening Project

2.8.30 This project proposes to widen the A12 between junction 19 (Chelmsford) and junction 25 (A120 interchange near Colchester) to ease congestion and cope with increasing traffic demands.

2.8.31 As of June 2025, the project was in the post-decision phase following the granting of consent in January 2024. The two projects do not overlap in Order Limits (the project is 4.3 km from the Norwich to Tilbury Project at the nearest point) with construction anticipated to finish in 2027 – there may me a small overlap in programme. The Habitats Regulations Assessment: No Significant Effects Report for the A12 Chelmsford to A120 Widening project has been reviewed to determine the potential for in-combination effects.

2.8.32 The A12 Chelmsford to A120 Widening project is situated approximately 14.2 km from the Stour and Orwell Estuaries SPA and Ramsar Site. The only impact pathways identified to the European Sites was habitat loss and disturbance to avian qualifying features, including lapwing and golden plover. It was concluded due to low numbers of these birds recorded during surveys, and the extensive availability of alternative arable habitat in the area, there would be no likely significant effects on the European Sites. In addition, the distance from the European Sites suggested any land used by these birds was not FLL, as lapwing and golden plover dispersing from the European Sites are more likely to use habitats within 5 km.

2.8.33 Owing to the distance of the European Site from the Norwich to Tilbury Project and the low numbers of birds recorded, it was concluded that the delivery of the A12 Chelmsford to A120 Widening project would not have a likely significant in-combination effect with the Project and it is not considered further.

East Anglia Three

2.8.34 This project comprises an offshore wind farm with the onshore development consisting of onshore transition pits at Bawdsey with two electrical and up to three fibre optic underground cables pulled through existing ducting laid by East Anglia One to connect at Bramford Substation. The connection at this substation overlaps with the Norwich to Tilbury Order Limits.

2.8.35 The onshore element of the project started construction in 2022, and works are expected to be completed in early 2026 and therefore are unlikely to overlap with the programme for the Norwich to Tilbury Project. The Habitats Regulations Assessment Screening report for East Anglia Three has been reviewed to determine the potential for in-combination effects.

2.8.36 The East Anglia Three project is situated over 5 km from the Stour and Orwell Estuaries SPA and Ramsar Site. No pathways to impact were identified to these European Sites (or any other European Sites relevant to the Norwich to Tilbury Project) during the HRA assessment.

2.8.37 Therefore, as no pathways to impact were identified and the construction programmes are unlikely to overlap, it has been concluded that the delivery of the East Anglia Three project would not have a likely significant in-combination effect with the Project and it is not considered further.

Lower Thames Crossing

2.8.38 The Lower Thames Crossing is a major infrastructure project by National Highways aimed at improving road capacity and reducing congestion east of London by creating a new 23 km route connecting the A2/M2 in Kent to the M25 in Essex. The project includes two of the UK's longest road tunnels under the River Thames, upgrades to surrounding roads, and a free-flow tolling system. The crossing is designed to support economic growth, improve journey reliability, and promote low-carbon, sustainable transport.

2.8.39 As of June 2025, the Lower Thames Crossing was in the pre-construction phase, with detailed design, surveys, and preparatory works underway. The project received Development Consent in March 2025 and is progressing toward full construction, which is expected to begin in 2026 through to 2030 which would overlap with the programme of the Norwich to Tilbury Project. There is also a direct overlap in Order Limits in the Tilbury area. The Habitats Regulations Assessment Screening Report and Statement to Inform Appropriate Assessment for Lower Thames Crossing as well as the final HRA have been reviewed to determine the potential for in-combination effects.

2.8.40 Several pathways to impact that have the potential to cause a likely significant effect to the Thames Estuary and Marshes SPA and Ramsar Site were considered during the Lower Thames Crossing HRA. The Norwich to Tilbury Order Limits are located 1.7 km from the Thames Estuary and Marshes SPA and Ramsar Site, and therefore the only pathways to impact that fall within the Norwich to Tilbury Order Limits ZoI are associated with birds using potential FLL, they include:

- Land take of FLL
- Collision risk
- Disturbance to FLL.

2.8.41 Although Lower Thames Crossing identified potential areas of FLL in the Tilbury area, no FLL was found within the Norwich to Tilbury Order Limits during bird surveys for the Norwich to Tilbury Project. Therefore, in-combination land loss and disturbance to birds using FLL around the Norwich to Tilbury Order Limits would not occur. In addition, within the Lower Thames Crossing in-combination screening assessment, it concluded that as Norwich to Tilbury would affect agricultural land within a similar area to the Lower Thames Crossing Order Limits, and timed to coincide, there would not be additional effects to the project alone.

2.8.42 The Lower Thames Crossing project would be tunnelled under the Thames Estuary and Marshes SPA and Ramsar Site. Inland, the above ground section overlaps with the Norwich to Tilbury Order Limits. The Lower Thames Crossing bird survey results returned very few records of qualifying bird features in this inland Tilbury area and concluded the risk of bird collision from vehicles would be inconsequential. The Screening Report also recognised overhead transmission lines would need to be re-directed for the project, but as the lines are already present, there would not be an increase in the collision risk. Adjustments to the overhead line are also proposed in this area for the Norwich to Tilbury Project. While new overhead lines are proposed north of the new Tilbury North Substation, no risk of collision has been identified as the overhead lines are in an area where there are already a great deal of overhead lines and no flight corridors likely to be used by birds are present. No in-combination likely significant effects with regard to collision were identified within the Lower Thames Crossing Screening report.

2.8.43 Therefore, it has been concluded that the delivery of the Lower Thames Crossing project would not have a likely significant in-combination effect with the Project and it is not considered further.

Thurrock Flexible Generation Plant

2.8.44 Thurrock Flexible Generation Plant comprises the construction and operation of Gas Reciprocating engines with up to 600 MW electrical capacity and Battery Storage with up to 150 MW electrical capacity. It is located on land adjacent to the National Grid Tilbury Substation in Thurrock, approximately 0.4 km south of the Norwich to Tilbury Order Limits.

2.8.45 Consent was granted for Thurrock Flexible Generation Plant in 2022, it is currently under construction and could overlap with the Norwich to Tilbury Project between 2027 and 2030. The final Habitats Regulations Assessment report for Thurrock Flexible Generation Plant has been reviewed to determine the potential for in-combination effects.

2.8.46 The only impact pathway identified as part of the Thurrock Generation Plant HRA, was construction activities having the potential to cause a likely significant effect through hydrology on the Thames Estuary and Marshes SPA and Ramsar Site. The Norwich to Tilbury Project is situated outside the ZoI for hydrology on the Thames Estuary and Marshes SPA and Ramsar Site.

2.8.47 Therefore, it has been concluded that the delivery of the Thurrock Flexible Generation Plant project would not have a likely significant in-combination effect with the Project and it is not considered further.

Tilbury to Grain and Tilbury to Kingsnorth (TRKE)

2.8.48 The TRKE project involves replacement of a cabled section of 400 kV circuits under the River Thames. The TKRE project comprises two areas: one at Gravesend (south side of the Thames) and one at Tilbury (north side of the Thames). The section at Tilbury is situated approximately 1.6 km south of the Norwich to Tilbury Order Limits.

2.8.49 Full planning permission was granted in January 2025, and construction could overlap with the Norwich to Tilbury Project. The report to inform Habitats Regulations Assessment for TRKE has been reviewed to determine the potential for in-combination effects.

2.8.50 The impact pathways identified that have the potential to cause an in-combination likely significant effect with the Norwich to Tilbury Project are associated with disturbance of qualifying bird features of the Thames Estuary and Marshes SPA and Ramsar Site. This includes construction related atmospheric noise, tunnelling below the River Thames and visual disturbance. Despite this, the bird surveys supporting the HRA found qualifying species were primarily situated away from the TRKE Order Limits, on intertidal habitats towards the mouth of the River Thames. On inland habitats, no qualifying bird features were found to be present. Similarly, the habitats within the Norwich to Tilbury Order Limits have not been found to constitute FLL for these species.

2.8.51 Therefore, it has been concluded that the delivery of the TRKE project would not have a likely significant in-combination effect with the Project and it is not considered further.

Tilbury 3

2.8.52 The Tilbury 3 proposals comprise an expansion to the Port of Tilbury, with a new 100 acre site consisting of a new port area and accommodation of storage and processing areas. The project is situated approximately 1.8 km south of the Norwich to Tilbury Order Limits.

2.8.53 A hybrid planning application was submitted in May 2025, and a decision is pending. There is the potential the construction programme could overlap with the Norwich to Tilbury Project. The report to Shadow Habitats Regulations Assessment for Tilbury 3 has been reviewed to determine the potential for in-combination effects.

2.8.54 The impact pathways identified that have the potential to cause an in-combination likely significant effect with the Norwich to Tilbury Project are associated with habitat loss and disturbance to qualifying bird features of the Thames Estuary and Marshes SPA and Ramsar Site. Due to its position on the River Thames, the focus of the Tilbury 3 HRA is on intertidal qualifying features of the SPA and Ramsar Site. The Norwich to Tilbury Order Limits do not consist of intertidal habitats (situated approximately 1.7 km from the SPA and Ramsar Site) and the only species recorded during the Norwich to Tilbury survey work, are species on the waterbird assemblage qualifying feature of the SPA and Ramsar Site (such as Lapwing) which are known to disperse inland. In addition, assemblage species were not record in significant numbers within the Norwich to Tilbury Order Limits and therefore do not constitute

FLL. No in combination effects with the Norwich to Tilbury Project were identified within the Tilbury 3 HRA.

2.8.55 Therefore, it has been concluded that the delivery of the Tilbury 3 project would not have a likely significant in-combination effect with the Project and it is not considered further.

Multiple Project In-Combination Effects

2.8.56 Likely significant in-combination effects could not be ruled out at this screening stage with the Project and Bramford to Twinstead, Five Estuaries Offshore Windfarm and North Falls Offshore Windfarm on the Stour and Orwell Estuaries SPA and Ramsar Site. Therefore, it could not be concluded at screening that all projects combined would not have a likely significant effect on these European Sites. As such, they are considered further at Stage 2 – Appropriate Assessment.

2.8.57 No projects have been identified as having the potential to cause a likely significant in-combination effect with the Norwich to Tilbury Project on the Thames Estuary and Marshes SPA and Ramsar Site. However, Lower Thames Crossing, Thurrock Flexible Generation Plant, TRKE and Tilbury 3 were considered as part of the in-combination screening exercise for the Thames Estuary and Marshes SPA and Ramsar Site and therefore are discussed again here for in-combination effects of all projects combined.

2.8.58 The in-combination impact pathways considered (with the exception of Thurrock Flexible Generation Plant) with the Norwich to Tilbury Project were associated with habitat loss of potential FLL (away from the European Sites) and disturbance of birds using FLL. Each of these projects returned very low numbers of qualifying bird species in land on arable habitats similar to those effected by the Norwich to Tilbury Project. Survey work has determined the main concentrations of qualifying bird species are associated with intertidal habitats, particularly closer to the mouth of the estuary. No FLL has been identified within the vicinity of the Norwich to Tilbury Order Limits. Therefore it was concluded that the delivery of all projects combined around Tilbury would not have a likely significant in-combination effect with the Project and are not considered further.

2.9 Potential LSEs on European Sites

2.9.1 Stage 1 of the HRA process identified the potential for LSEs (resulting from the proposal on its own or in-combination effects with other plans or projects) on three European Sites:

- Norfolk Valley Fens SAC
- Stour and Orwell Estuaries Ramsar Site
- Stour and Orwell Estuaries SPA.

2.9.2 The potential LSEs relate to construction activities; all operation (and maintenance) LSEs have been screened out. For each European Site, the potential LSEs relate to one or more qualifying features and relate to the impact pathways outlined below. These have therefore been taken forward to Appropriate Assessment.

- Norfolk Valley Fens SAC

  - ZoI 5 – Changes in hydrology such as surface and ground water quality
- Stour and Orwell Estuaries Ramsar Site
  - ZoI 1 – Permanent / temporary land loss (or change of use)
  - ZoI 2 – Fragmentation of habitat
  - ZoI 4 – Disturbance through change in noise, vibration, light and movement
  - ZoI 5 – Changes in hydrology such as surface and ground water quality
  - ZoI 6 – Changes in air quality from dust and vehicle emissions
- Stour and Orwell Estuaries SPA
  - ZoI 1 – Permanent / temporary land loss (or change of use)
  - ZoI 2 – Fragmentation of habitat
  - ZoI 4 – Disturbance through change in noise, vibration, light and movement
  - ZoI 5 – Changes in hydrology such as surface and ground water quality
  - ZoI 6 – Changes in air quality from dust and vehicle emissions.

2.9.3 The citations, Natura 2000 data sheets, Ramsar information sheets and conservation objectives of these three sites are provided in Appendix E: Citations and Conservation Objectives.

2.10 Sensitivity Testing

2.10.1 Within the Project, there is a level of flexibility on delivery and potential for there to be alterations to the design (and in certain aspects there are design scenarios see Table 2.2). As a component of the screening, sensitivity testing was conducted to determine if changes to the Project that are within the Project parameters were to occur, could this change the outcome of the HRA screening conclusion. The testing at this stage helps assess whether changes in assumptions tip the balance toward a LSE.

2.10.2 As the screening assumed that all land in the Order Limits has the potential to be affected by the Project, any change in design scenario that is within the LoD would not change the conclusions of the screening. This also applies to any longitudinal, vertical and latitudinal variations within the LoD.

2.10.3 As a result, the sensitivity testing concluded that the flexibility within the Project is assessed within the screening.

3. HRA Stage 2 - Appropriate Assessment

3.1 Scope of Assessment

3.1.1 LSEs could not be ruled out on three European Sites during HRA Stage 1: Screening and therefore have been carried through to Stage 2: Appropriate Assessment. A detailed assessment of these LSEs is provided alongside discussion as to whether they adversely affect the integrity of a European Site after the application of mitigation. No LSEs were identified on European Sites during operation (and maintenance). This Appropriate Assessment discusses construction LSEs only. Due to the significant overlap between Stour and Orwell Estuaries SPA and Ramsar Site designations, the Ramsar Site is considered in parallel to the SPA.

3.1.2 The Appropriate Assessment includes consideration of embedded, standard (good practice) and additional mitigation measures taken from the Outline CoCP (document reference 7.2). The CoCP is secured through Requirement 4 of the draft DCO (document reference 3.1).

3.2 Norfolk Valley Fens SAC

Changes in Hydrology – Surface and Ground Water Quality

3.2.1 The following potential impact pathways to sedimentation and/or pollution effects upon the SAC were identified during the screening process:

- The haul road and the base of pylon RG24 would be constructed within 50 m of the watercourse that downstream flows adjacent to the SAC
- UKPN wooden pole lines would be undergrounded to avoid conflict with the new 400 kV overhead line; this would involve trenching within 30 m of the watercourse which flows adjacent to the SAC, as well as an underground crossing of the watercourse likely using an open cut technique
- The stringing of new conductors for the new 400 kV overhead line would directly cross the watercourse. Potential changes in the ground and surface water arising from construction activities may lead to the degradation of habitats within the SAC.

3.2.2 The works outlined above pose a risk of a pollution incident to surface and ground water flowing into a watercourse which then flows alongside the SAC. The watercourse is considered to be hydrologically connected to the habitats within the SAC, and as such, a pollution incident has the potential to affect the qualifying habitats and the qualifying species they support (as shown within the matrices of Table 2.5, and the citation details in Appendix D: Details of European Sites Scoped In and E: Citations and Conservation Objectives) of this European Site. Pollution incidents could include sediment loading in watercourses from topsoil stripping, or pollutants entering the watercourse following an accident/incident.

3.2.3 The risk of a pollution incident would be controlled with the pollution mitigation measures detailed in the Outline CoCP (document reference 7.2), secured through Requirement 4 of the draft DCO (document reference 3.1). Table 3.1 details the relevant construction mitigation measures which when implemented would avoid hydrological pollution and sedimentation incidents.

3.2.4 As such, there would be **no adverse effect** on the qualifying features or the conservation objectives of the SAC. Therefore there is **no adverse effect on the integrity** of the Norfolk Valley Fens SAC.

Table 3.1 Extract of relevant hydrological standard (good practice) mitigation measures in the Outline CoCP (document reference 7.2)

Reference	Standard Mitigation Measure
W01	All qualifying works within and in proximity to main rivers and flood defences will be in accordance with a method approved under environmental permits issued by the Environment Agency under the Environmental Permitting (England and Wales) Regulations 2016. Qualifying works to ordinary watercourses will accord with the protective provisions of the DCO for the benefit of the LLFAs
W02	For open cut watercourse crossings and installation of vehicle crossing points, mitigation measures will include but not be limited to: • Where practicable, reducing the working width for open cut crossings of a main or ordinary watercourse whilst still providing safe working and reinstating the riparian vegetation and natural bed of (where practical) the watercourse, using the material removed when appropriate on completion of the works and compacting as necessary • Installation of a pollution boom downstream of open cut works • The use and maintenance of temporary lagoons, tanks, bunds, silt fences or silt screens as required • Have spill kits and straw bales readily available at all crossing points for downstream emergency use in the event of a pollution incident • The use of all static plant such as pumps in appropriately sized spill trays • Prevent refuelling of any plant or vehicle within 15 m of any watercourse • Prevent storing of soil stockpiles within 15 m of any watercourse or drain where practicable • Inspect all plant prior to work adjacent to watercourses for leaks of fuel or hydraulic fluids. Reinstating the riparian vegetation and natural bed of the watercourse, using appropriately sized material of similar composition to that removed. As far as practicable, gravel will be retained in-channel. Where practicable, reinstated material will aim to closely match what is removed, particularly gravel, at between 15 and 40 mm in size to ensure suitability for fish spawning.
W03	Riverbank and in-channel vegetation will be retained where not directly affected by installation works. Culverts in waterbodies will either preserve the natural bed or be box culverts with inverts sunk a minimum of 300 mm below the hard bed of the watercourse with natural/existing bed material placed across the inside of the culvert to lift the level up to meet that of the existing. New culverts will be as short as practicable and sized to avoid narrowing of natural channel widths. Temporary culverts will be sized to convey flows generated by upstream catchments to maintain the current land drainage regime and during culvert installation, downstream flows would be maintained.

Reference	Standard Mitigation Measure
W04	Active private water supplies will be identified with landowners through the landowner discussions and baseline monitoring will be undertaken. Appropriate measures will be considered during construction to protect these private water supplies. In the event of a landowner or tenant reporting that installation activities have affected their private water supplies, an initial response will be provided within 24 hours. Where the installation works have been shown to affect a private water supply, an alternative water supply will be provided, as appropriate. Irrigation pipes will be avoided where practicable or alternative supplies will be provided where temporary interactions are unavoidable.
W05	In the event of a spill during construction, a response would be triggered in accordance with approved site procedures. In the unlikely event of a spill not being suitably contained on site and reaching a water source that supports abstraction for private water supply, when detriment to a water supply is proven as part of the incident investigation, an alternative supply will be provided until the contamination is suitably remediated.
W06	Where a main river is crossed by a trenchless crossing, the cables will be laid at least 1 m below the hard bed level of the river and will remain at or below this level for not less than 3 m from the brink of the riverbank. Marker posts shall also be positioned on each bank of the river to indicate the location of the under-crossing and the nature of the works. The Project proposed the following trenchless crossings (as detailed in Table 4.9 within ES Chapter 4: Project Description (document reference 6.4)): • Section C: Higham Road • Section C: River Stour (north part), River Stour (south part) • Section C: A12 highway crossing • Section C: Railway crossing (east of Ardleigh).
W07	Where construction activities take place in Flood Zone 3, temporary construction compounds, laydown areas and other work sites will be laid out in accordance with the Sequential Test and incorporate flood resilience measures where necessary. There would be no land raising and storage of construction equipment and materials will be done in such a way as to avoid forming barriers to floodplain flows. Material storage areas will be located outside of the fluvial floodplain where practicable.
W08	Measures to manage surface water runoff from operational above ground infrastructure and to maintain existing overland flow routes, for example the proposed box culverts at the proposed Tilbury North Substation and the eastern of the two CSE compounds, will be developed liaising with the LLFAs. Such measures will be managed in accordance with the requirements and standards of the relevant LLFA and maintained for the Project's lifetime. Surface water runoff will be

Reference	Standard Mitigation Measure
	captured using sustainable drainage techniques that will be designed to allow for climate change resilience and with consideration of exceedance flow routes.
W09	Where construction activities take place within surface water flood zones, including statutory undertaker works, prior to works commencing appropriate site drainage will be put in place to reduce the risk of standing water and avoid substantial delays to the construction programme, as well as to prevent offsite increases in surface water flood risk.
W10	Where temporary construction haul roads pass within or cross watercourses and/or their floodplains and key overland flow routes, the haul road design will include flood mitigation/drainage to allow for the flow of water within the floodplain during flood events up to and including the 1% Annual Exceedance Probability event (i.e., ducting). The design of the haul roads themselves will include some resilience to flooding for example, incorporating suitable geo-textiles to stabilise the road surfacing, as well as allowing water to flow within the floodplain. Suitable materials would be used to surface the haul roads. In some cases, bespoke construction methodologies may be used based on site constraints and ground conditions.
W11	Construction activities within Flood Zones 2 and 3 will include mitigations to avoid effects on the flood storage capacity of the zone.
W12	For access roads and haul roads, the Project requires the crossing of multiple ditches, drains and watercourses. Large or sensitive watercourses, for example those designated as main rivers, and those with Water Framework Directive (WFD) status, would be crossed using clear span bridges or suitably assessed and approved alternatives. Soffit heights at clear span crossings would be set on a site-specific basis, following more detailed survey and design work by the appointed Main Works Contractor(s). On watercourses with a high or good WFD status for invertebrates, soffits will be set as high as is practicable above the Q95 water level, accounting for site specific constraints and to reduce impacts to ecology.
W13	Surface water drainage features, based on Sustainable Drainage System (SuDS) techniques, will be installed at temporary compound sites and laydown areas during construction. These areas will be reinstated after completion of the temporary works, as agreed with the landowner. Access roads and haul roads, as well as areas where impermeable material will be installed where heavy equipment would be used, will also have suitable drainage provisions via appropriate SuDS that will provide attenuation and treatment of runoff.
W14	Once the Project has been constructed, the working areas will be removed. Any stripped topsoil will be reinstated, and the site will be returned to its former use, subject to any planting restrictions or agreements with landowners. Temporary bridges and culverts (associated with the temporary constructionhaul roads) will only be retained by exception e.g. if the new temporary structure has replaced an existing one in poor repair. When these locations are confirmed, crossings would be designed to reflect their permanence e.g. culvert sizing to accommodate climate change allowance. Replacement drainage schemes will be installed where appropriate. A specialised drainage contractor(s) will review the drainage

Reference	Standard Mitigation Measure
	designs and the relevant LLFA will be consulted on proposals (where it is not simply a replacement of the existing drainage run). The specialist contractor(s) will provide advice to National Grid and the Main Works Contractor(s) during all relevant construction and reinstatement activities. Permanent records of the land drainage locations will be made and passed to the landowners/occupiers.
W15	Temporary and permanent drainage outfalls proposed will comprise only a small diameter (less than 300 mm) buried pipe and a small outfall structure set into the bank of the watercourse. A wide swathe is included within the Order Limits to allow flexibility to aid the selection of an outfall location and pipe alignment that is technically feasible and one that minimises effects on vegetation loss. Works will minimise effects where practicable.
W16	The water supply needs of the Project during construction will be sourced either from mains water supply or in remote locations, where this option may not be available, water will be tankered in. Water use would be monitored and reported and measures to encourage efficient water use would be put in place. Grey water generated from welfare facilities will be discharged to the public sewer, or where this is not practicable, collected and tankered off site to a licensed disposal facility.
W17	For events up to and including the 1% Annual Exceedance Probability flood event plus climate change, where pylons would be located within the fluvial floodplains of watercourses, compensatory storage within the Order Limits will be provided for loss of floodplain storage.
W18	The temporary access route and underground cables will cross flood defences. The crossing designs would avoid impacts on the defence foundations and construction works would be undertaken using methods that limit ground movement/settlement to reduce the potential to compromise the condition and stability of the defence. In line with the requirements of the Environment Agency, should the potential for an impact to the flood defences be identified at the detailed design stage, then the flood defence would be monitored to establish a pre-construction baseline and for a period after completion of works to construct the crossings to enable detection of any effects on the structural integrity/condition of the assets during construction of the Project. The requirement for any such monitoring will be discussed with the Environment Agency as part of the application for a Flood Risk Activity Permit.
W19	The proposed Wenham Grove CSE compound would be positioned within the defined Limits of Deviation in Flood Zone 1, avoiding Flood Zone 3.
W20	Pylons would be situated a minimum of 8 m from the top of bank of any designated Main River and a minimum of 3.5 m from the top of bank of any ordinary watercourses.

3.3 Stour and Orwell Estuaries SPA and Ramsar Site

Changes in Hydrology – Surface and Ground Water Quality

3.3.1 The following potential impact pathways that could affect hydrology, such as surface and ground water quality, on FLL associated with the SPA and Ramsar Site were identified during the screening process:

- Underground cabling within two areas of FLL that have been identified within the Order Limits. Attenuation ponds are proposed within both areas, draining into existing field ditches / drains.

3.3.2 These works have the potential to affect the hydrological conditions of arable land which has been identified as FLL as it supports significant numbers of wintering lapwing and golden plover which form part of the waterbird assemblage qualifying feature of the SPA and Ramsar Site. The two areas of FLL are located at Survey Location 8 and 10 as shown on Figure 4: Stour and Orwell Estuaries Functionally Linked Land in Appendix C: Figures.

3.3.3 The existing arable fields have a network of ditches along field margins to ensure good drainage across the area, and as such, the working area could disrupt this drainage system. During construction, this has the potential to affect the remaining areas of FLL outside the Order Limits, primarily through flooding and pollution events. The arable land and the associated drainage network of ditches would be restored following the construction period, and as such, no longer term hydrological effects would occur.

3.3.4 Two TAD ponds are proposed in FLL within Survey Location 8 and one in FLL within Survey Location 10. These TAD ponds would play a role in managing excess water and preventing flooding. They would store stormwater while gradually releasing it at greenfield rates into the existing drainage ditch system. In addition, the risk of working pollution incidents would be controlled by the measures in the Outline CoCP (document reference 7.2), secured through Requirement 4 of the draft DCO (document reference 3.1), as detailed in the Norfolk Valley Fens SAC section above.

3.3.5 When implemented, these mitigation measures would avoid flooding and pollution incidents to FLL. As such, there would be **no adverse effect on the integrity** of the Stour and Orwell Estuaries SPA and Ramsar Site through hydrology.

3.3.6 The following potential impact pathways that could affect hydrology, such as surface and ground water quality, on the SPA and Ramsar Site directly (rather than FLL) were identified during the screening process:

- Trenchless crossing of the River Stour at two locations. One is approximately 5.5 km upstream of the SPA and Ramsar Site, while the other is over 6 km upstream. The crossing closest to the SPA and Ramsar Site has a construction access road and working area approximately 50 m from the watercourse, while the other crossing working area is approximately 60 m from the watercourse
- Three TAD ponds would drain into the river with a fourth into Langham Lake which is hydrologically connected to the river when flooded. Two of these ponds are situated around the closest crossing, with the others approximately 5.4 km upstream of the SPA and Ramsar Site.

3.3.7 These works pose a risk of a pollution incident to surface and ground water flowing into the River Stour, which flows into the SPA and Ramsar Site. This has the potential to affect all the qualifying features of the SPA and Ramsar Site (as shown within the matrices of Table 2.6 and Table 2.7, and the citation details in Appendix D: Details of European Sites Scoped In and E: Citations and Conservation Objectives). The works are situated beyond the 4 km ZoI agreed with Natural England for hydrological effects to statutory rivers, but has been progressed to appropriate assessment as a precaution.

3.3.8 Pollution incidents could include sediment loading in watercourses from topsoil stripping, drilling muds / bentonite entering the watercourse following an accidental outbreak, and / or the mobilisation of pollutants such as bentonite, oil and fuel at the drill sites if flood events occur. A Trenchless Method Statement and Contingency Plan for the River Stour will be prepared post consent, which will be submitted to the Local Planning Authority and Natural England for information prior to construction of this phase of works. This commitment is outlined at B26 within the Outline CoCP (document reference 7.2) and secured via Requirement 4 of the DCO.

3.3.9 The TAD ponds would play a role in managing excess water and preventing flooding. They would store stormwater while gradually releasing it at greenfield rates. In addition, the risk of working pollution incidents would be controlled by the measures in the Outline CoCP (document reference 7.2), secured through Requirement 4 of the draft DCO (document reference 3.1), as detailed in the Norfolk Valley Fens SAC section above.

3.3.10 When implemented, these mitigation measures would avoid hydrological pollution incidents. As such, there would be **no adverse effect on the integrity** of the Stour and Orwell Estuaries SPA and Ramsar Site through hydrology.

Changes in Air Quality from Dust and Vehicle Emissions

3.3.11 The following potential impact pathways to changes in air quality effects upon FLL associated with the SPA and Ramsar Site were identified during the screening process:

- The installation of the underground cable through the two areas of FLL would require a 120 m wide excavation and working area (combined), a compound area, a laydown area and TAD ponds. The working activities (dust creation) and use of vehicles and machinery (emissions) for these works have the potential to effect remaining FLL outside the Order Limits within a 200 m ZoI.

3.3.12 The FLL consists of arable habitat which is subject to farming practices including cultivating and spraying with fertiliser and chemicals. The potential effects from construction air quality are considered to be insignificant compared to this management of land. This is supported by the fact arable land is not a habitat that is considered in the Habitat Impact section of the Air Pollution Information System (APIS) when emission pollutants are selected (APIS, N.D). Crop rotation is likely to have a more significant role in the quality of this habitat as FLL.

3.3.13 It was agreed within the EIA Scoping Opinion (document reference 6.20) that the effects from vehicle emissions associated with traffic during construction could be scoped out of the Environmental Statement (ES) (which includes European Sites), provided it can be demonstrated that the predicted volumes of traffic would not exceed the relevant indicative criteria for air quality assessment set out in the Institute of Air Quality Management (2019) guidance. No significant negative effects

on habitats because of construction traffic have been identified in Chapter 7: Air Quality (document reference 6.7) of the ES in Section 7.7 and so air quality effects to habitats and species associated with construction traffic would not lead to an effect on the integrity of a European Site.

3.3.14 Even though arable land is not a habitat considered vulnerable to air quality affects, the risk of dust pollution would be controlled along the entirety of the Project through the implementation of the Outline Dust Management Plan set out within the Outline CoCP (document reference 7.2), secured through Requirement 4 of the draft DCO (document reference 3.1). These measures would ensure no air quality pollution incidents would occur at FLL.

3.3.15 As such, there would be **no adverse effect on the integrity** of the Stour and Orwell Estuaries SPA and Ramsar Site through air quality.

Habitat Loss, Fragmentation and Disturbance

3.3.16 LSEs were identified during the screening process, associated with two areas of FLL at Survey Location 8 and 10 (shown on Figure 4: Stour and Orwell Estuaries Functionally Linked Land in Appendix C: Figures), identified as important for lapwing and golden plover which are species considered part of the waterbird assemblage qualifying feature. These LSEs on FLL were:

- Temporary land loss
- Fragmentation of habitat
- Disturbance through change in noise, vibration, light and movement.

3.3.17 The potential impact pathways on the SPA and Ramsar Site FLL are associated with the proposed installation of underground cable during construction. The underground cable would pass through two areas of FLL.

3.3.18 The installation of the underground cable through the two areas of FLL would require a 120 m wide excavation and working area (combined), a compound area, a laydown area and TAD ponds.

3.3.19 The FLL land area at Survey Location 8 (shown on Figure 4: Stour and Orwell Estuaries Functionally Linked Land in Appendix C: Figures) is approximately 50 ha. Approximately 12.5 ha of cropland would be temporarily removed during the construction works. The works would fragment the remaining FLL into one 11 ha parcel of land to the west of the Order Limits and one 26.5 ha parcel of land to the east. These retained areas of cropland are within the 500 m ZoI for disturbance effects, and partially within the air quality ZoI (200 m). Therefore, in the absence of mitigation, 50 ha of FLL at this location would be temporarily lost as it would be is unlikely to be suitable for, or used by, significant numbers of lapwing and golden plover while construction works are underway within this part of the Order Limits.

3.3.20 The FLL land area at Survey Location 10 (shown on Figure 4: Stour and Orwell Estuaries Functionally Linked Land in Appendix C: Figures) is approximately 81 ha. Approximately 26.5 ha of cropland would be temporarily removed during construction. The works would fragment the remaining FLL into one 8 ha parcel of land to the north of the Order Limits, one 11.5 ha parcel of land to the south, and one 35 ha parcel of land to the west. These retained areas are within the 500 m ZoI for disturbance (noise, vibration, light and visual), and partially within the air quality ZoI (200 m). Therefore, in the absence of mitigation, approximately 81 ha of FLL at this

location would be temporarily lost as it would be unlikely to be suitable or used by significant numbers of lapwing and golden plover while construction works are underway within this part of the Order Limits.

3.3.21 The habitat loss would be temporary, with the Project estimated to be completed within four years and works in these areas would be completed well within this timeframe (with precise timings dependent on detailed design). Once the underground cabling works are complete, the land would be returned to agriculture (within the timeframe of the Project programme) to be farmed in a similar manner as it was prior to construction. It is therefore assumed that the land would continue to constitute FLL when construction works are complete.

Effects of Habitat Loss and Disturbance

3.3.22 An assessment to determine whether the LSEs above would adversely affect the integrity of the Stour and Orwell Estuaries SPA and Ramsar Site is provided in the paragraphs that follow.

3.3.23 Although significant numbers of lapwing and golden plover have been recorded (in relation to the Stour and Orwell Estuaries SPA and Ramsar Site WeBS data), Table 3.2 shows the generally low numbers and irregularity of records within the FLL survey locations across the survey period.

Table 3.2 Lapwing and golden plover sightings at survey locations 8 and 10 during wintering bird surveys

	Peak Count (Grounded)											
Visit Number:	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
Survey Location 8												
Lapwing	0	0	0	0	34	0	6	0	0	45	0	0
Golden Plover	0	0	0	0	0	0	0	0	0	0	0	0
Survey Location 10												
Lapwing	0	0	5	0	1	0	0	0	60	0	0	0
Golden Plover	0	0	0	0	0	0	0	0	70	0	0	0

3.3.24 The five-year peak mean count (2018/2019 to 2022/2023) of lapwing on the Stour and Orwell Estuaries SPA and Ramsar Site is 2,006 birds, with golden plover at 1,338 birds. In terms of the national population, the British Trust for Ornithology (BTO) figures estimate wintering numbers of 635,000 lapwing and 410,000 golden plover. This demonstrates that although these species are part of the waterbird assemblage for the Stour and Orwell Estuaries SPA and Ramsar Site, they are still relatively common wintering birds, which are known to winter in wetland and arable landscapes across the country.

3.3.25 The survey results also indicate that the lapwing and golden plover flocks recorded in the FLL are transient, likely using alternative arable habitat available in the surrounding area. The use of these fields by lapwing and golden plover could be determined by a wide range of external factors such as weather, farming activities in

the wider area and field status (i.e., ploughed / tilled, holding winter crops, fallow etc.).

3.3.26 To assess the effect that the temporary loss of FLL from these two areas would have in this locality, a desk study was carried out to review the potential availability of alternative habitat within the 5 km IRZ of the SPA and Ramsar Site. This also informed an assessment of the significance of the two areas of FLL in relation to the wider landscape.

3.3.27 This desk study was focussed on winter roosting suitability for lapwing and golden plover, which characteristically roost in large, open arable and grassland fields. The assessment of alternative habitat combined a review of these habitats and field size. The field size categories used were determined following a literature review (Shrubb, 1988, Fuller and Lloyd, 1981) and observations during the Project survey work. The literature review indicated that fields that are more than 15 to 20 ha in size are generally preferred for roosting by these species. This result is in keeping with the Project survey work. It was evident during survey work that lapwing and golden plover would primarily use the largest field available (generally more than 20 ha) but would also 'spill-over' or re-settle after a disturbance onto an adjoining smaller field (generally around 10 ha or sometimes smaller). Several smaller fields of between 4 and 7 ha are present within the total 81 ha of FLL at Survey Location 10; the boundary features comprise ditches or low defunct hedgerows that maintain an open landscape.

3.3.28 The following field size categories were used:

- > 20 ha = Excellent
- 15 – 20 ha = Good
- 10 – 15 ha = Average
- < 10 ha = Unsuitable unless adjoining a larger field with open boundary.

3.3.29 The distribution of the alternative habitat identified during this desk study is shown on Figure 3: Assessment of Field Sizes Suitable for lapwing and golden plover within 5 km of the Stour and Orwell Estuaries SPA and Ramsar Site, in Appendix C: Figures. Fields that are within the Order Limits and a 500 m potential disturbance zone from the Project have not been identified as suitable for the displaced birds. Figure 3 also illustrates that there are extensive areas of suitable habitat within the 5 km IRZ, particularly to the south of the River Stour.

3.3.30 The total area of alternative habitat available to the displaced lapwing and golden plover within the 5 km IRZ comprises:

- > 20 ha (Excellent) = 5,551 ha
- 15 – 20 ha (Good) = 1,693 ha
- 10 – 15 ha (Average) = 2,612 ha
- < 10 ha (Unsuitable) = **5,752 ha.**

3.3.31 The total area of 'Excellent', 'Good' and 'Average' alternative habitat in the 5 km IRZ is 9,856 ha. The total area of the FLL at Survey Location 8 and 10 is 131 ha, which is 1.3% of the alternative habitat figure. Although the alternative fields have not been confirmed as FLL through survey work **(as agreed with Natural England)**, there is a large area of potential alternative habitat in the surrounding area. The abundance of

suitable alternative habitat is likely to explain the irregularity of sightings within the FLL at Survey Location 8 and 10.

3.3.32 No additional mitigation measures for the birds that would be temporarily displaced is therefore proposed. The desk study has shown there is sufficient alternative habitat within the 5 km IRZ suitable to provide FLL that would support lapwing and golden plover during the construction phase and therefore there would be **no adverse effect on the integrity** of the SPA and Ramsar Site associated with the temporary loss of FLL. This conclusion was **agreed with Natural England** (refer to Appendix B: Consultation Documents).

3.4 In-Combination Effects

3.4.1 In accordance with Planning Inspectorate Advice on Habitats Regulations Assessments, the plans or projects identified at Stage 1 – Screening where a potential in-combination effect could not be ruled out are required to be considered at the Appropriate Assessment stage. The projects where LSE could not be ruled out with the Project were Bramford to Twinstead, Five Estuaries Offshore Wind Farm and North Falls Offshore Wind Farm, all with potential to affect the Stour and Orwell Estuaries SPA and Ramsar Site. These also have the potential to cause a multiple project combined effect on the European Sites.

Bramford to Twinstead

3.4.2 The Appropriate Assessment within the HRA Report for Bramford to Twinstead has been reviewed to determine the potential for in-combination effects.

3.4.3 The only European Site where a potential LSE could not be ruled out at Stage 1 – Screening for Bramford to Twinstead was the Stour and Orwell Estuaries SPA and Ramsar Site.

3.4.4 Both projects could not screen out the potential for LSEs on the Stour and Orwell SPA and Ramsar Site that may arise from a reduction in surface water and ground water quality and therefore proceeded to Appropriate Assessment. The Bramford to Twinstead HRA (National Grid, 2024) concluded that, with the implementation of appropriate mitigation measures, there would be **no adverse effect on the integrity** of the SPA and Ramsar Site from the Project alone or in-combination as these measures would reduce the likelihood of effect such that a potential impact from pollution and sedimentation incidents would be avoided. The Norwich to Tilbury Project would also implement standard / good practice mitigation measures as detailed in the Outline CoCP (document reference 7.2) (and is secured by Requirement 4 in the draft DCO (document reference 3.1).

3.4.5 **As both projects would implement suitable mitigation, it has been concluded that delivery of these projects could be managed without an adverse in-combination effect on the integrity of qualifying features of the Stour and Orwell Estuaries SPA and Ramsar Site or any other European Site as agreed with Natural England (refer to Appendix B: Consultation Documents).**

Five Estuaries and North Falls Offshore Wind Farms

3.4.6 These two projects are combined for this section as their Order Limits overlap where the potential for in-combination effects with the Norwich to Tilbury Project have been identified (at the new EACN Substation connection). The potential in-combination effects relate to habitat loss and disturbance to qualifying features using potential FLL.

3.4.7 No FLL for qualifying features was identified in the area where these projects coincide during survey effort for the Five Estuaries and North Falls Offshore Wind Farms. In addition, the Order Limits of the Five Estuaries and North Falls projects largely sit within the ZoI for the Norwich to Tilbury Project in this area, thereby minimising land take identified as alternative habitat for Lapwing and Golden Plover (species within the waterbird assemblage qualifying feature) as shown on Figure 3: Assessment of Field Sizes Suitable for Lapwing and Golden Plover within 5 km of the Stour and Orwell Estuaries SPA and Ramsar Site in Appendix C: Figures.

3.4.8 The Five Estuaries Offshore Wind Farm assessment provides similar commentary on Lapwing behaviour as the Norwich to Tilbury Project. It rules out an effect on the integrity of the Stour and Orwell Estuaries SPA and Ramsar Site alone and in-combination with the Norwich to Tilbury Project:

'Lapwing use a vast area of inland arable habitat during the non-breeding season. The use is dependent on arable practices and management (manure spreading and sugar beet production) and therefore the areas used change year to year. Within the east of England there is considerable arable habitat for lapwing to use. Habitat will be available for lapwing, despite development occurring at the Project and potentially in combination projects identified. In-combination effects will not undermine conservation objectives and therefore there will be no adverse effect on integrity of the Stour and Orwell Estuaries SPA / Ramsar site'.

3.4.9 These projects affect a similar area of arable land and conclude that there is sufficient alternative habitat for the affected species (i.e. Lapwing), that no significant effects would arise.

3.4.10 **It is therefore concluded that delivery of these Projects would not lead to an adverse in-combination effect on the integrity of qualifying features of the Stour and Orwell Estuaries SPA and Ramsar Site or any other European Site as agreed with Natural England (refer to Appendix B: Consultation documents).**

Multiple Project In-Combination Effect

3.4.11 The only project that has the potential to cause a hydrological likely significant in-combination effect with Norwich to Tilbury on the Stour and Orwell Estuaries SPA and Ramsar Site, is Bramford to Twinstead. Therefore, a multiple project in-combination would not occur for this impact pathway.

3.4.12 The Five Estuaries and North Falls Offshore Windfarm projects both have the potential to cause in-combination effects with Norwich to Tilbury on the Stour and Orwell Estuaries SPA and Ramsar Site in relation to habitat loss and disturbance to qualifying features (birds) using potential FLL. The project programmes overlap with all three of these projects and they have overlapping Order Limits where this effect is possible, and therefore the projects combined are not considered to increase the effect. In addition, it has been shown that there is sufficient alternative habitat

available that would provide FLL for the Lapwing that would be affected by these projects.

3.4.13 **Therefore an in-combination effect for all projects combined would not affect the integrity of qualifying features of the Stour and Orwell Estuaries SPA and Ramsar Site or any other European Site as agreed with Natural England (refer to Appendix B: Consultation documents).**

3.5 Sensitivity Testing

3.5.1 At the Appropriate Assessment stage sensitivity testing helps in the evaluation of the robustness of conclusions about the potential of adverse effects on the integrity of European Sites. As part of the Appropriate Assessment, sensitivity testing was undertaken to determine if changes to the Project within the LoD, would this change the outcome of the Appropriate Assessment conclusions.

3.5.2 This Appropriate Assessment has assumed there could be changes to the design within the LoD within the Order Limits, and therefore all habitats within the Order Limits could be affected. It is considered **no changes to the conclusions of adverse effects on the integrity of a European Site would occur**, providing the mitigation described in the Outline CoCP (document reference 7.2), secured by Requirement 4 of the draft DCO (document reference 3.1), is implemented.

4. Conclusion

4.1.1 There were 28 European Sites identified within the Study Area. No LSEs were identified for the 23 sites that were screened out at pre-screening stage, as they are situated outside the relevant ZoI and as such there are no pathways that could result in an impact. These include:

- Outer Thames Estuary SPA
- Breckland SPA
- Broadland Ramsar Site
- Broadland SPA
- Deben Estuary Ramsar Site
- Deben Estuary SPA
- Sandlings SPA
- Hamford Water Ramsar Site
- Hamford Water SPA
- Colne Estuary (Mid-Essex Coast Phase 2) Ramsar Site
- Colne Estuary (Mid-Essex Coast Phase 2) SPA
- Abberton Reservoir Ramsar Site
- Abberton Reservoir SPA
- Dengie (Mid-Essex Coast Phase 1) Ramsar Site
- Dengie (Mid-Essex Coast Phase 1) SPA
- Blackwater Estuary (Mid-Essex Coast Phase 4) Ramsar Site
- Blackwater Estuary (Mid-Essex Coast Phase 4) SPA
- Crouch and Roach Estuaries (Mid-Essex Coast Phase 3) Ramsar Site
- Crouch and Roach Estuaries (Mid-Essex Coast Phase 3) SPA
- Benfleet and Southend Marshes Ramsar Site
- Benfleet and Southend Marshes SPA
- Medway Estuary and Marshes Ramsar Site
- Medway Estuary and Marshes SPA.

4.1.2 There were five sites carried forward to the detailed screening stage. These included:

- Norfolk Valley Fens SAC
- Stour and Orwell Estuaries SPA
- Stour and Orwell Estuaries Ramsar Site
- Thames Estuary and Marshes SPA
- Thames Estuary and Marshes Ramsar Site.

4.1.3 Following detailed screening, no LSEs were identified for the Thames Estuary and Marshes SPA and Ramsar Site.

4.1.4 In the absence of mitigation, direct LSEs through changes in hydrology could not be screened out for the Norfolk Valley Fens SAC or the Stour and Orwell Estuaries SPA and Ramsar Site.

4.1.5 In the absence of mitigation, indirect LSEs through temporary land loss, fragmentation of habitat, disturbance (through noise, vibration, light and movement), changes in air quality and changes in hydrology could not be screened out at FLL for the waterbird assemblage qualifying feature of the Stour and Orwell Estuaries SPA and Ramsar Site. Two areas of FLL are present within the Order Limits, which have been used by significant numbers of roosting lapwing and golden plover which are part of the waterbird assemblage of the Stour and Orwell Estuaries SPA and Ramsar Site.

4.1.6 The Appropriate Assessment concluded there would be **no adverse effects on the integrity** of the Norfolk Valley Fens SAC and the Stour and Orwell Estuaries SPA and Ramsar Site with regard to hydrology once mitigation measures within the Outline CoCP (document reference 7.2), secured through Requirement 4 of the draft DCO (document reference 3.1) are implemented. This includes direct and indirect (through FLL) effects at the Stour and Orwell Estuaries SPA and Ramsar Site. This conclusion was **agreed with Natural England** (refer to Appendix B: Consultation documents).

4.1.7 The Appropriate Assessment concluded there would be **no adverse effects on the integrity** of the Stour and Orwell Estuaries SPA and Ramsar Site with regard to air quality on FLL associated with the waterbird assemblage qualifying feature. This is primarily due to the FLL consisting of arable habitat which is not considered to be vulnerable to effects air quality effects. Furthermore, the Outline Dust Management Plan, appended to the Outline CoCP (document reference 7.2), secured through Requirement 4 of the draft DCO (document reference 3.1) would be adhered to during the works. This conclusion was **agreed with Natural England** (refer to Appendix B: Consultation documents).

4.1.8 The Appropriate Assessment concluded that there would be **no adverse effects on the integrity** of the Stour and Orwell Estuaries SPA and Ramsar Site with regard to habitat loss, fragmentation and disturbance on FLL associated with the waterbird assemblage qualifying feature, due to sufficient availability of alternative suitable habitat within the 5 km IRZ that would support lapwing and golden plover that would be temporarily displaced by the construction works. This conclusion was **agreed with Natural England** (refer to Appendix B: Consultation documents).

4.1.9 Following an assessment of other plans and projects at Stage 1 Screening and Stage 2 Appropriate Assessment to determine the potential for an in-combination effect, it was concluded that there would be no effect on the integrity of any European or Ramsar Sites, their qualifying features or their conservation objectives. This conclusion was **agreed with Natural England** (refer to Appendix B: Consultation documents).

4.1.10 **As no adverse effects on the integrity of a European Site (following the implementation of mitigation) have been identified during the Appropriate Assessment, the HRA does not require progression to Stage 3 of the HRA process.**

Abbreviations

Abbreviation	Full Reference
AIS	Air Insulated Switchgear
BNG	Biodiversity Net Gain
BTO	British Trust for Ornithology
CBS	Cement-Bound Sand
CoCP	Code of Construction Practice
cSAC	Candidate Special Area of Conservation
CTMP	Construction Traffic Management Plan
CWS	County Wildlife Site
DCO	Development Consent Order
DMRB	Design Manual for Roads and Bridges
EACN	East Anglia Connection Node
EIA	Environmental Impact Assessment
ES	Environmental Statement
FLL	Functionally Linked Land
FTE	Full Time Equivalent
GI	Ground Investigation
GIS	Gas Insulated Switchgear
Habitats Regulations	The Conservation of Habitats and Species Regulations 2017
HDD	Horizontal Directional Drilling
HGV	Heavy Goods Vehicle
HRA	Habitats Regulations Assessment
IDB	Internal Drainage Board
IROPI	Imperative reasons of overriding public interest
IRZ	Impact Risk Zone
kV	Kilovolt
LLFA	Lead Local Flood Authority
LoD	Limits of Deviation
LRN	Local Road Network

Abbreviation	Full Reference
LSE	Likely Significant Effect
LWS	Local Wildlife Site
MRN	Major Road Network
NETS	National Electricity Transmission System
NRMM	Non-Road Mobile Machinery
NSIP	Nationally Significant Infrastructure Project
Project	Norwich to Tilbury
PRoW	Public Right of Way
pSPA	Potential Special Protection Area
RSPB	Royal Society for the Protection of Birds
SAC	Special Area of Conservation
SCI	Site of Community Importance
SPA	Special Protection Area
SQSS	Security and Quality of Supply Standard
SRN	Strategic Road Network
SSSI	Site of Special Scientific Interest
SWMP	Site Waste Management Plan
TAD	Temporary Attenuation Drainage
UKPN	UK Power Networks
VP	Vantage point
WeBS	Wetland Bird Survey
ZoI	Zone of Influence

Glossary

Term	Definition
Biodiversity	The variability among living organisms from all sources including terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part: this includes diversity within species, between species and of ecosystems.
Cable	An insulated conductor designed for underground installation.
Cable Sealing End	Structures used to transfer transmission circuits between underground cables and overhead lines.
Cable Sealing End compound	Electrical infrastructure used as the transition point between overhead lines and underground cables. A compound on the ground acts as the principal transition point.
County Wildlife Site	Non-designated areas of land important for their wildlife and nature conservation value.
Ecosystem	A dynamic complex of plant, animal and micro-organism communities and their non-living environment interacting as a functional unit.
European Site	Statutory, formally designated sites for their ecological importance. They are protected under UK law through the Conservation of Habitats and Species Regulations 2017 (as amended in 2019). This means they have legal protection and any plan or project that might affect them must undergo a Habitats Regulations Assessment (HRA).
Functionally Linked Land	'Functionally linked land' (FLL) is a term often used to describe areas of land or sea occurring outside a designated site which is considered to be critical to, or necessary for, the ecological or behavioural functions in a relevant season of a qualifying feature for which a Special Area of Conservation (SAC)/Special Protection Area (SPA)/Ramsar Site has been designated. These habitats are frequently used by SPA species and supports the functionality and integrity of the designated sites for these features.
Fauna	All the animals in a given area.
Flora	The plants within a particular habitat or region.
Groundwater	Water that is in the ground. This is usually referring to water in the saturated zone below the water table.
Habitat	The natural home or environment of an animal, plant, or other organism.
Habitats Regulations Assessment	The process by which plans and projects are assessed as to whether they are likely to have a significant effect on a European Site either alone or in combination with other plans or projects, under the Conservation of Habitats and Species Regulations 2017, as amended in 2019.

Term	Definition
Haul road	Another term used for the temporary access route, which is a temporary route built to carry construction vehicles within the Order Limits.
Horizontal directional drilling	Trenchless method for the installation of pipes, in a shallow arc using a surface-launched drilling rig. It applies to large-scale crossings in which a fluid filled pilot bore is drilled without rotating the drill string, and this is then enlarged by a washover pipe and back reamer to the size required for the product pipe.
Local Planning Authority	The public authority whose duty it is to carry out specific planning functions for a particular area.
Local Wildlife Site	Non-designated areas of land important for their wildlife and nature conservation value.
Mitigation	The action of reducing the severity and magnitude of change (impact) to the environment. Measures to avoid, reduce, remedy or compensate for significant adverse effects as per the mitigation hierarchy.
National Site Network	A UK-wide network of protected areas established under the Conservation of Habitats and Species Regulations 2017 (as amended in 2019), following the UK's departure from the European Union (EU). It comprises all existing Special Areas of Conservation (SACs) and Special Protection Areas (SPAs) that were previously part of the EU's Natura 2000 network, along with any new sites designated under UK law.
National Vegetation Classification	A system of classifying natural habitat types in Great Britain according to their vegetation types.
Notable species	Species of conservation concern as listed under s41 of the Natural Environment and Rural Communities Act 2006.
Notable bird species	Birds listed under s41 of the Natural Environment and Rural Communities Act 2006, under Schedule 1 of the Wildlife and Countryside Act 1981, as amended and those listed as red or amber in the Birds of Conservation Concern 5 (Stanbury et al., 2021).
Order Limits	The maximum extent of land within which the authorised development may take place.
Overhead line	Conductor (wire) carrying electric current, strung from pylon to pylon.
Priority species	Species identified as of principal importance in England, in accordance with requirements of the Natural Environment and Rural Communities Act 2006. These are based on the UK Biodiversity Action Plan Priority Species.
Ramsar site	A European Site which is a wetland of international importance designated under the Ramsar Convention, an international treaty signed in 1971 in Ramsar, Iran, aimed at conserving and sustainably using wetlands.

Term	Definition
Schedule 1 species	Birds listed under Schedule 1 of the Wildlife and Countryside Act 1981, as amended.
Site of Special Scientific Interest (SSSI)	SSSIs are protected by law under the Wildlife and Countryside Act 1981. They are important because they support rare or endangered fauna and flora, and they represent the United Kingdom's best wildlife and geological sites.
Special Area of Conservation (SAC)	A European Site is a protected site designated under the Conservation of Habitats and Species Regulations 2017 to conserve natural habitat types and species of European importance (excluding birds). SACs form part of the UK's National Site Network and are selected based on the presence of habitats listed in Annex I and species listed in Annex II of the Habitats Directive (Directive 92/43/EEC), which are considered most in need of conservation at a European level.
Special Protection Area (SPA)	A European Site designated under the Conservation of Habitats and Species Regulations 2017 to protect habitats with rare, vulnerable, and migratory bird species, originally established under the EU Birds Directive 2009. These sites form part of the UK's National Site Network and are legally protected based on scientific criteria to ensure the conservation of qualifying bird populations.
Species	A group of living organisms consisting of similar individuals capable of exchanging genes or interbreeding.
Substation	Substations are used to control the flow of power through the electricity system. They are also used to change (or transform) the voltage from a higher to lower voltage to allow it to be transmitted to local homes and businesses.
Trenchless crossing	A crossing installation method that has limited above ground disturbance which is used to avoid a sensitive feature such as an environmental feature.
UK Power Networks (UKPN)	UK Power Networks (Operations) Limited (registered company number 03870728) and/or its affiliate Eastern Power Networks plc (registered company number 02366906) as applicable.
Underground cable	An insulated conductor carrying electric current designed for underground installation. Underground cables link together two Cable Sealing End compounds.
Zone of Influence	The defined geographic area within which the Project's environmental receptors are located.

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Appendix A. Bird Surveys and Desk Study Work

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Appendix A
Bird Surveys and Desk Study Work

A.1 Introduction

A.1.1 This appendix provides a review of bird surveys carried out by National Grid and desk study data from record centres / holders. This review focusses on bird species which make up the 'Qualifying Species' and 'Assemblage Species' of the Stour and Orwell Estuaries SPA / Ramsar Site and the Thames Estuary and Marshes SPA / Ramsar Site.

A.2 Desk Study Data

Data Search Criteria and Areas

A.2.1 The desk study comprised a search for bird records within 2 km of the Order Limits. Full details and limitations are presented in ES Appendix 8.8: Wintering and Passage Bird Report (document reference 6.8.A8).

A.2.2 As this assessment focuses on species associated with the Stour and Orwell Estuaries SPA / Ramsar site and the Thames Estuary and Marshes SPA / Ramsar Site, the data was filtered to only show records of relevant Qualifying and Assemblage Species associated with the SPA / Ramsar Sites. The Qualifying and Assemblage Species differ between each SPA / Ramsar Site and therefore records have been clipped to within 10 km of their corresponding SPA / Ramsar Site (and within 2 km of the Order Limits). This buffer zone was selected to present a wide picture of bird distribution around the SPA / Ramsar Sites.

A.2.3 Qualifying and Assemblage Species are defined in ES Appendix 8.8: Wintering and Passage Bird Report (document reference 6.8.A8). In summary, Qualifying Species include those which are present in internationally important numbers to form qualifying features on the SPA / Ramsar Site designation, while Assemblage Species include species listed as noteworthy (often present in nationally important numbers) within the overall waterbird assemblage qualifying feature, as well as lapwing and golden plover (that are not listed as either a Qualifying or Assemblage Species) for which concern was raised by Natural England during consultation and engagement.

A.2.4 The search comprised gathering records from within the previous 10 years (2013 to 2022) and was filtered to show passage and wintering bird records only (September to March inclusive). Data was obtained from the following sources:

- British Trust for Ornithology (BTO) – Wetland and Estuaries Bird Survey (WeBS) (September 2022)
- Royal Society for the Protection of Birds (RSPB) (August 2022)
- Essex Field Club (July 2022)
- Norfolk Biodiversity Information Centre (July 2022)
- Suffolk Biodiversity Information Service (July 2022).

Results

A.2.5 The distribution of Qualifying and Assemblage Species is shown on Figure A8.8.3 and Figure A8.8.4 within ES Appendix 8.8: Wintering and Passage Bird Report (document reference 6.8.A8) and summarised below in Table A.1 and Table A.2 for the Stour and Orwell Estuaries SPA / Ramsar Site and Thames Estuary and Marshes SPA / Ramsar Site respectively.

A.2.6 As shown within the figures mentioned above and Table A.1, few records of Qualifying Species of the Stour and Orwell Estuaries SPA and Ramsar Site are present within 2 km of the Project. The highest number of records relate to black-tailed godwit, and the majority of these are located around Langham Lake (name of WeBS site) situated along the River Stour. As well as the lake, there are flooded areas, wet grassland and large arable fields in this area. A smaller number of records are present at Ardleigh Reservoir.

A.2.7 A similar trend can be seen in the Assemblage Species for the Stour and Orwell Estuary SPA / Ramsar Site. The average count for these species is generally low, but good numbers of lapwing, gadwall and wigeon are present. The records of these species are also primarily associated with the habitats around Langham Lake, with a smaller number at Ardleigh Reservoir, gadwall and wigeon numbers are also boosted by birds utilising reservoirs to the west of Langham Lake, including a reservoir which is part of Thorington Street Pit and Reservoir County Wildlife Site (CWS).

A.2.8 No records of Qualifying Species exist inside the Order Limits within 10 km of the Thames Estuary and Marshes SPA / Ramsar site and the only Assemblage Species record within the Order Limits is a single tufted duck record. The records that are present are generally situated within 2 km of the SPA and Ramsar Site rather than within habitats associated with the Order Limits.

Table A.1 Qualifying and assemblage species within 10 km of the Stour and Orwell Estuaries SPA / Ramsar Site and 2 km of the Order Limits

Species	No. of Records	Total no. of Individuals	Average Count	Max Count	Last Record
Qualifying Species					
Black-tailed Godwit	21	129	6.14	19	2020
Brent Goose (Dark-bellied)	0	0	0.00	0	-
Dunlin	4	9	2.25	4	2019
Grey Plover	1	1	1.00	1	2015
Knot	1	2	2.00	2	2015
Pintail	7	19	2.71	9	2019
Redshank	10	27	2.70	8	2018
Assemblage Species					
Cormorant	41	319	7.78	31	2021

Species	No. of Records	Total no. of Individuals	Average Count	Max Count	Last Record
Curlew	8	14	1.75	3	2019
Gadwall	21	327	15.57	120	2021
Golden Plover	5	10	2.00	6	2018
Goldeneye	2	9	4.50	8	2019
Great Crested Grebe	31	192	6.20	25	2021
Lapwing	34	2,024	59.53	600	2021
Ringed Plover	4	5	1.25	2	2018
Shelduck	29	173	5.97	26	2021
Turnstone	1	3	3.00	3	2015
Wigeon	11	525	47.73	194	2021

Table A.2 Qualifying and assemblage species within 10 km of the Thames Estuary and Marshes SPA / Ramsar Site and 2 km of the Order Limits

Species	No. of Records	Total no. of Individuals	Average Count	Max Count	Last Record
Qualifying Species					
Avocet	32	251	7.84	94	2020
Black-tailed Godwit	29	246	8.48	94	2020
Dunlin	26	194	7.46	81	2020
Grey Plover	22	173	7.86	72	2020
Hen Harrier	1	1	1.00	1	2017
Knot	11	62	5.64	31	2020
Redshank	15	61	4.07	21	2016
Ringed Plover	18	89	4.94	45	2020
Assemblage Species					
Gadwall	16	227	14.19	32	2019
Golden Plover	5	5	1.00	1	2019
Greenshank	10	19	1.90	5	2020
Lapwing	29	593	20.45	370	2020
Little Egret	42	168	4.00	40	2020

Species	No. of Records	Total no. of Individuals	Average Count	Max Count	Last Record
Little Grebe	44	237	5.39	31	2020
Pintail	8	12	1.50	3	2020
Pochard	33	322	9.76	34	2020
Ruff	2	2	1.00	1	2020
Shelduck	36	284	7.89	106	2020
Shoveler	15	171	11.40	46	2019
Spotted Redshank	1	3	3.00	3	2013
Teal	54	412	7.63	85	2020
Tufted Duck	57	1,199	21.04	141	2020
Water Rail	41	106	2.59	19	2021

A.3 Project Survey Work

Survey Area and Approach

A.3.1 To inform the HRA, it was agreed with Natural England that bird surveys should focus on identifying potential FLL associated with the Stour and Orwell Estuaries SPA / Ramsar Site and the Thames Estuary and Marshes SPA / Ramsar Site.

A.3.2 The following criteria were agreed upon to determine an appropriate survey area for baseline data collection. Areas within the Scoping Report corridor[26] that met at least one of the below criteria were subjected to wintering / passage bird survey work:

- Suitable habitat to support wintering / passage plovers within any of the IRZs, up to 5 km, associated within the SSSIs that underpin the Stour and Orwell Estuaries SPA / Ramsar Site. Suitable habitat would typically include large open arable fields supporting winter cereals, base till, and certain grasslands. Small, enclosed fields or urban areas are not suitable and therefore excluded
- Suitable habitat within 500 m of the River Stour
- Suitable habitat within all IRZs for the Thames Estuary and Marshes SPA / Ramsar Site.

A.3.3 In line with the above, five locations were identified, mapped, and agreed as survey locations for the 2022 / 2023 season around the Stour and Orwell Estuaries SPA / Ramsar Site. The survey locations are numbered in line with a wider Project survey scope (not related to the HRA), and so these are Survey Locations 7 to 11 (shown on Figure A8.8.1 in ES Appendix 8.8: Wintering and Passage Bird Report (document reference 6.8.A8)).

[26] The corridor presented at the 2022 non-statutory consultation and within the Environmental Impact Assessment (EIA) Scoping Report (document reference 6.19).

A.3.4 Additional survey locations were added to the scope for the 2023 / 2024 survey season. These were located at the southern end of the Project around Tilbury, and following design changes, just four have been taken forward for analysis (Survey Locations 19 to 22) (shown on Figure A8.8.1 in ES Appendix 8.8: Wintering and Passage Bird Report (document reference 6.8.A8)). These locations were selected for analysis with respect to FLL, as they provided potentially suitable habitat within 5 km of the Thames Estuary and Marshes SPA and Ramsar Site. In addition, the habitat in this area had been mapped as FLL as part of the Lower Thames Crossing project.

A.3.5 A total of nine on-site survey locations are therefore included in this assessment. Most of the Stour and Orwell Estuaries SPA / Ramsar Site locations are affected by the underground cable alignment. A stretch of overhead line is proposed through part of Survey Location 10 and into Survey Location 11. The latter location is situated where proposed conductors pass over Ardleigh Reservoir (within 5 km of the Stour and Orwell Estuaries SPA / Ramsar Site).

A.3.6 Full survey methodology can be found in ES Appendix 8.8: Wintering and Passage Bird Report (document reference 6.8.A8). In summary, a mix of transect and vantage point (VP) surveys were used depending on access restrictions and visibility. The surveys followed an adaption to the BTO WeBS methodology which is based on a 'look-see' approach (Bibby *et al*., 2000; Gilbert *et al.*, 1998). At VP11, to assess collision risk with the proposed overhead line, information was collated on the flight movements of birds following an adaption of the Scottish Natural Heritage (now NatureScot) guidance for onshore wind farm development assessments (Scottish Natural Heritage, 2017).

A.3.7 The surveys were conducted twice a month between October and February and once during September and March, thereby totalling 12 visits. Slight variation to this occurred at the Tilbury site, as detailed in the limitations of ES Appendix 8.8: Wintering and Passage Bird Report (document reference 6.8.A8). In addition, one of the Tilbury Survey Locations (19) was dropped from the scope mid-season as the habitats on site were clearly unsuitable for Qualifying and Assemblage Species, and no birds of note were being recorded on site. Figure 5: Wintering Passage Bird Survey Locations within 5km of the Stour and Orwell Estuaries and Figure 6: Wintering Passage Bird Survey Locations within 5 km of the Thames Estuary and Marshes in Appendix C: Figures show the survey locations in relation to the designated sites.

Results – Stour and Orwell Estuaries SPA / Ramsar Site

Collision Risk

A.3.8 Table A.3 and Table A.4 summarise the results of the collision risk VP surveys at Survey Location 11 for the Stour and Orwell Estuaries SPA / Ramsar Site species. As shown, no Qualifying Species were observed in flight (a grounded dark-bellied brent goose was observed and is discussed later within this summary) and cormorant was the only Assemblage Species recorded. Just eight cormorant flights were observed, with a total of 2.75 minutes at collision risk height (as shown by highlighted height bands in Table A4), which amounts to just 0.12% of the total VP time.

Table A.3 Time spent by Stour and Orwell Estuaries SPA / Ramsar Site Species at collision risk height (indicated by highlighted height bands) at VP11

Species	<10 m (minutes)	10-25 m (minutes)	25-50 m (minutes)	50-75 m (minutes)	>75 m (minutes)
Cormorant	0.5	2	0.75	0	0

Table A.4 Cormorant flight details at VP11

Species	Month and Year	Count	Record Description
Cormorant	October 2022	1	Flying over at 10 – 25 m
Cormorant	November 2022	1	Flying over at 10 – 25 m
Cormorant	December 2022	1	Flying over at 10 – 25 m
Cormorant	December 2022	1	Flying over at < 10 m
Cormorant	December 2022	1	Landing on water
Cormorant	February 2023	1	Flying over at 10 – 25 m
Cormorant	February 2023	1	Flying over at 25 – 50 m
Cormorant	February 2023	1	Flying over at 10 – 25 m

Habitat Loss and Disturbance of FLL

A.3.9 Most of the survey effort for the Stour and Orwell Estuaries SPA / Ramsar Site wintering / passage bird assessment consisted of transect surveys, with the exception of two VP surveys. The VP at Survey Location 11 was designed to cover collision risk analysis, but also returned notes on habitat use by birds. The VP at Survey Location 9 was used alongside a transect due to access restrictions. Survey Location 9 includes the River Stour, Langham Lake and associated wetlands / arable fields, which was identified as having a concentration of bird records during the desk study.

A.3.10 A summary of the peak counts from transect and VP surveys (combined) for the Stour and Orwell Estuaries SPA / Ramsar Site species are presented in Table A.5. This table includes birds in flight overhead.

Table A.5 Peak counts of qualifying and assemblage species during transect and VP surveys for the Stour and Orwell Estuaries SPA / Ramsar Site survey area

Common Name	Peak Count	No. of months (out of 7)
Survey Location 7		
Assemblage Species		
Golden Plover	1	1

Common Name	Peak Count	No. of months (out of 7)
Lapwing	3	3
Survey Location 8		
Assemblage Species		
Lapwing	60	4
Survey Location 9		
Qualifying Species		
Black-tailed Godwit	4	1
Assemblage Species		
Cormorant	1	1
Lapwing	54	4
Shelduck	3	1
Wigeon	5	1
Survey Location 10		
Qualifying Species		
Brent Goose (Dark-bellied)	8	1
Assemblage Species		
Cormorant	21	4
Curlew	4	1
Gadwall	45	1
Golden Plover	70	1
Great Crested Grebe	3	2
Lapwing	60	3
Wigeon	1	1
Survey Location 11		
Qualifying Species		
Brent Goose (Dark-bellied)	1	1
Listed Species		
Cormorant	1	4
Gadwall	25	3
Great Crested Grebe	2	1

A.3.11 Two Qualifying Species were recorded during the survey work: black-tailed godwit and dark-bellied brent goose. A single record of four black-tailed godwit was made at Survey Location 9. Dark-bellied brent goose was recorded at Survey Location 10 and 11 on single occasions, with eight birds and one bird recorded at each location respectively.

A.3.12 Assemblage Species included cormorant, curlew, gadwall, golden plover, great crested grebe, lapwing, shelduck and wigeon. Most of these records were at Survey Location 10 and, to a lesser extent, Survey Locations 7, 8, 9 and 11. Survey Location 10 did cover a large area of mainly arable land with a fishing lake.

A.3.13 To determine the importance of each survey location, the significance of the HRA Qualifying and Assemblage Species recorded is outlined in Table A.6. The peak counts used in this table are of birds utilising the habitats within the survey location (birds flying overhead have been discounted here). Where data is available, peak counts have been compared to counts listed on the SPA and Ramsar Site citations, as well as peak mean counts from the Stour and Orwell Estuaries SPA WeBS data (provided by the BTO to cover the SPA area only). Where counts are over the 1% threshold, the percentage within the table has been shown in **Bold** text.

Table A.6 Significance of peak counts of qualifying and assemblage species for the Stour and Orwell Estuaries SPA / Ramsar Site recorded during wintering bird surveys

Species	Peak Count and Survey Location No.					% of SPA Citation (1995/1996 to 1999/00)					% of Ramsar Site Citation (1995/1996 to 1999/2000)					% of Stour and Orwell Estuaries SPA WeBS Peak Mean Count (2018/2019 to 2022/2023)				
	7	8	9	10	11	7	8	9	10	11	7	8	9	10	11	7	8	9	10	11
Qualifying Species																				
Black-tailed Godwit	-	-	4	-	-	-	-	0.2	-	-	-	-	0.2	-	-	-	-	0.2	-	-
Brent Goose (Dark-bellied)	-	-	-	8	1	-	-	-	0.3	<0.1	-	-	-	0.3	<0.1	-	-	-	0.3	<0.1
Assemblage Species																				
Cormorant	-	-	1	21	1	-	-	-	-	-	-	-	0.4	9.1	0.4	-	-	0.2	3.3	0.2
Curlew	-	-	-	4	-	-	-	-	-	-	-	-	-	0.2	-	-	-	-	0.2	-
Gadwall	-	-	-	45	25	-	-	-	-	-	-	-	-	-	-	-	-	-	23.6	13.1
Golden Plover	1	-	-	70	-	-	-	-	-	-	-	-	-	-	-	<0.1	-	-	5.2	-
Great Crested Grebe	-	-	-	3	2	-	-	-	-	-	-	-	-	1.2	0.8	-	-	-	2.8	1.9
Lapwing	1	45	12	60	-	-	-	-	-	-	-	-	-	-	-	<0.1	2.2	0.6	3.0	-
Shelduck	-	-	3	-	-	-	-	-	-	-	-	-	0.1	-	-	-	-	0.2	-	-
Wigeon	-	-	5	1	-	-	-	-	-	-	-	-	-	-	-	-	-	0.2	<0.1	-

A.3.14 The peak counts of Qualifying Species made during the surveys, are below 1% of the numbers on the SPA and Ramsar Site citations, as well as the mean peak counts from the Stour and Orwell Estuaries SPA WeBS data.

A.3.15 Two Assemblage Species reach the 1% threshold of the bird figures on the Ramsar Site citation: cormorant and great crested grebe, both at Survey Location 10. These birds were associated with the large waterbodies within the survey area.

A.3.16 Excluding cormorant and great crested grebe (discussed above), three additional Assemblage Species are shown as significant (>1% of the five-year peak mean WeBS count) against the Stour and Orwell Estuaries SPA WeBS data: gadwall (Survey Locations 10 and 11), golden plover (Survey Location 10) and lapwing (Survey Locations 8 and 10).

A.3.17 Gadwall were recorded on waterbodies while lapwing and golden plover were observed roosting in suitable arable fields.

Results – Thames Estuary and Marshes SPA / Ramsar Site

A.3.18 Figure 7: Thames Estuary and Marshes SPA / Ramsar Site Assemblage Species Results in Appendix C: Figures, shows the survey results. Peak counts for the Qualifying and Assemblage Species of the Thames Estuary and Marshes SPA / Ramsar Site are presented in Table A.7. This table includes birds in flight overhead. [Note: Survey Location 19 is not in the table as no Qualifying or Assemblage Species were recorded, as discussed below.]

Table A.7 Peak counts of qualifying / assemblage species during VP surveys for the Thames Estuary and Marshes SPA / Ramsar Site survey area

Common name	Peak Count	No. of months (out of 6)
Survey Location 20		
Assemblage Species		
Little Grebe	1	1
Pochard	1	1
Tufted Duck	5	3
Survey Location 21		
Assemblage Species		
Golden Plover	1	1
Lapwing	114	1
Survey Location 22		
Assemblage Species		
Lapwing	101	3

A.3.19 No Qualifying Species were recorded at Survey Locations 19 to 22. Assemblage Species were recorded at Survey Locations 20, 21 and 22 (although at Survey

Location 22 this was only birds flying overhead). At Survey Location 20, three Assemblage Species were recorded on a small waterbody: little grebe, pochard and tufted duck. At Survey Location 21, a single record of calling Golden Plover was made, while records of roosting and flying lapwing were also made. Lapwing flocks were also recorded at Survey Location 22; these were all of birds in flight overhead rather than using the habitats within the area. A more detailed breakdown of the lapwing records across these survey locations is provided in Table A.8.

Table A.8 Lapwing observations made during wintering bird surveys across Tilbury survey locations

Survey Location	Date	Behaviour and Flight Direction	Count
21	11/01/24	Roosting	75
		Flying overhead (south-east)	39
	23/01/24	Roosting	43
22	30/11/23	Flying overhead (north)	31
	07/12/23	Flying overhead (south)	101
	12/01/24	Flying overhead (west)	47

A.3.20 As shown within Table A.9, the peak counts of the Assemblage Species at Survey Locations 20 and 21 are small and do not exceed the 1% threshold for the Ramsar Site citation (where available) or the peak mean counts of the Thames Estuary and Marshes SPA WeBS data (provided by the BTO to cover the SPA area only).

Table A.9 Significance of peak counts of assemblage species for the Thames Estuary and Marshes SPA / Ramsar Site recorded during Tilbury wintering bird surveys at Survey Locations 20 and 21

Assemblage Species	Peak Count (Survey Location 20 and 21)		% of Ramsar Site Citation (1998/1999 to 2002/2003)		% of Thames Estuary and Marshes SPA WeBS Peak Mean Count (2018/2019 to 20022/2023)	
	20	21	20	21	20	21
Golden Plover	-	1	-	-	-	<0.1
Lapwing	-	75	-	-	-	0.6
Little Grebe	1	-	0.4	-	<0.1	-
Pochard	1	-	-	-	<0.1	-
Tufted Duck	5	-	-	-	0.2	-

A.4 Summary and Evaluation

Stour and Orwell Estuaries SPA / Ramsar Site

Collision Risk

A.4.1 With respect to collision risk, the initial desk study results show the records of Qualifying and Assemblage Species within a 10 km buffer of the Stour and Orwell Estuaries SPA / Ramsar Site and within 2 km of the Project were low. Records within the vicinity of overhead line sections of the Project are concentrated at Ardleigh Reservoir; these bird numbers are lower than those associated with the River Stour and Langham Lake which are situated away from overhead line sections (shown within Figures A8.8.3 and A8.8.4 in ES Appendix 8.8: Wintering and Passage Bird Report (document reference 6.8.A8)).

A.4.2 The VP surveys completed at Survey Location 11 (at Ardleigh Reservoir) reflect this low number of birds. No Qualifying Species were recorded in flight and the only Assemblage Species recorded was cormorant. These flights were few and the time at collision risk height was insignificant when compared to the total VP survey time (<1% of the total VP survey time).

Habitat Loss and Disturbance of FLL

A.4.3 The desk study revealed the highest number of Qualifying and Assemblage Species records are located around Langham Lake (name of WeBS site), situated along the River Stour, which corresponds with Survey Location 9.

A.4.4 During the survey work, Qualifying Species were not found in significant numbers at any of the survey locations and the habitats within the Order Limits were not considered suitable to support large numbers of the estuarine Qualifying Species (comprising largely arable land).

A.4.5 The Assemblage Species that have been recorded in significant numbers during the survey work are associated with waterbodies (cormorant, gadwall and great crested grebe) and large arable fields (lapwing and golden plover).

A.4.6 Although cormorant, gadwall and great crested grebe show as significant, their numbers are still considered low as they are common wintering birds found at most inland rivers and waterbodies across the UK. Therefore, they are not considered to be birds associated with the SPA / Ramsar Site that are reliant on this habitat, and as such, the Order Limits are not considered FLL for these species.

A.4.7 Following consultation with Natural England, it was determined the fields used by lapwing and golden plover in significant numbers should be considered FLL. A map showing the field results of grounded lapwing and golden plover which also shows the extent of the FLL is shown on Figure A8.8.17 in ES Appendix 8.8: Wintering and Passage Bird Report (document reference 6.8.A8).

Thames Estuary and Marshes SPA / Ramsar Site

Collision Risk

A.4.8 No VP surveys were completed at the Tilbury survey locations to determine collision risk. This was due to the fact the Project proposals presented at statutory consultation in 2024 were for underground cabling in this area, while the new design includes works to the existing overhead line infrastructure. Where the new overhead lines commence north of Tilbury, habitats are sub-optimal for SPA / Ramsar Site species (as shown by the lack of Qualifying and Assemblage species records at Survey Location 19 along with few desk study records) and do not form 'green corridors' which were selected for VP surveys as agreed during consultation on survey scope in 2022 (see section 1.4 Engagement and consultation).

Habitat Loss and Disturbance of FLL

A.4.9 The desk study results indicate that most of the Thames Estuary and Marshes SPA / Ramsar Site Qualifying and Assemblage Species are associated with the Thames Estuary, with insignificant numbers within the Order Limits.

A.4.10 No significant numbers of Qualifying or Assemblage Species were recorded in the Order Limits during the survey work. Therefore, the combination of survey and desk study results show that the Order Limits are not FLL for Thames Estuary and Marshes SPA / Ramsar Site Qualifying and Assemblage Species.

Appendix B. Consultation Documents

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Appendix B
Consultation Documents

Thames Estuary and Marshes SPA / Ramsar Site and Stour and Orwell Estuaries SPA / Ramsar Site – Natural England Consultation Letters

Date: 20 May 2025
Our ref: Norwich to Tilbury Draft HRA
Your ref: n/a

NATURAL ENGLAND

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By email only: contact@n-t.nationalgrid.com

Customer Services
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CW1 6GJ

0300 060 3900

Dear Sir/Madam,

Norwich to Tilbury electricity transmission project (formerly East Anglia GREEN)
Draft HRA Screening Minutes and Slides - February 2025

Natural England is a non-departmental public body. Our statutory purpose is to ensure that the natural environment is conserved, enhanced, and managed for the benefit of present and future generations, thereby contributing to sustainable development.

Thames Estuary & Marshes SPA/Ramsar Site
Further to our call of the 20 May 2025 I can confirm that Natural England are content for you to screen out impacts on Thames Estuary & Marshes SPA/Ramsar.

Stour & Orwell Estuaries SPA/Ramsar Site: Field Availability
Based on the information that you have provided relating to the Stour & Orwell Estuaries SPA/Ramsar, Natural England do consider that there is sufficient alternative agricultural land to provide refuge for any birds disturbed during the construction phase of the development.

For clarification of any points in this letter, please contact [redacted] at [redacted]@naturalengland.org.uk

Yours faithfully,

[redacted]
Sustainable Development Senior Officer – West Anglia

Date: 19 August 2025
Our ref: Norwich to Tilbury
Your ref: n/a

Freepost N TO T
By email only: contact@n-t.nationalgrid.com;
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Customer Services
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0300 060 3900

Dear Sir/Madam,

Norwich to Tilbury electricity transmission project Habitats Regulations Assessment ('HRA') - August 2025

Thank you for your consultation on the above document. Natural England is a non-departmental public body. Our statutory purpose is to ensure that the natural environment is conserved, enhanced, and managed for the benefit of present and future generations, thereby contributing to sustainable development.

Identification of Potential Effects on European Sites
Study Area
Natural England concurs that the sites identified and taken forward to the screening stage are considered appropriate and exhaustive. Natural England has not identified any impact pathways to any other international site designated for the purposes of ecology.

HRA Screening
Thames Estuary and Marshes Special Protection Area ('SPA') and Ramsar and Stour and Orwell SPA and Ramsar
As noted in Appendix B, Natural England is now content that the construction and operational stages of Norwich to Tilbury can be carried out without impacting on SPA species using functionally linked land. We advise, however, that all information provided to Natural England which allowed us to reach that conclusion should be drawn in to the HRA document, either into the main body or within the appendices.

See further note on appropriate assessment below.

Norfolk Valley Fens Special Area of Conservation ('SAC')
Whilst noting the proximity of the project to North Valley Fens SAC, we advise that due to nature of development the proposal is of relatively low risk when considering the qualifying features of the SAC. We do not, therefore, disagree with the screening conclusion as presented in the draft HRA document.

Appropriate Assessment
Where relying on a CoCP or other document is important that the key elements relied upon to conclude that there will be no adverse effects are drawn through into the Appropriate Assessment. We therefore commend inclusion of Table 3.1 - Extract of relevant hydrological standard (good practice) mitigation measures in the Outline CoCP (document reference 7.2).

With regards to Horizontal Directional Drilling, Natural England has recently provided advice to the North Falls Offshore Wind project and the document provided is considered a good example. I attach a link below for your information.

EN010119-000321-7.15 Outline Horizontal Directional Drill Method Statement and Contingency Plan.pdf

The above not withstanding, we consider that impacts on internationally designated sites through changes to hydrological changes should be avoidable

In combination Assessment
Natural England considers that both the projects identified and the conclusions drawn are appropriate.

For clarification of any points in this letter, please contact [redacted] at [redacted]@naturalengland.org.uk

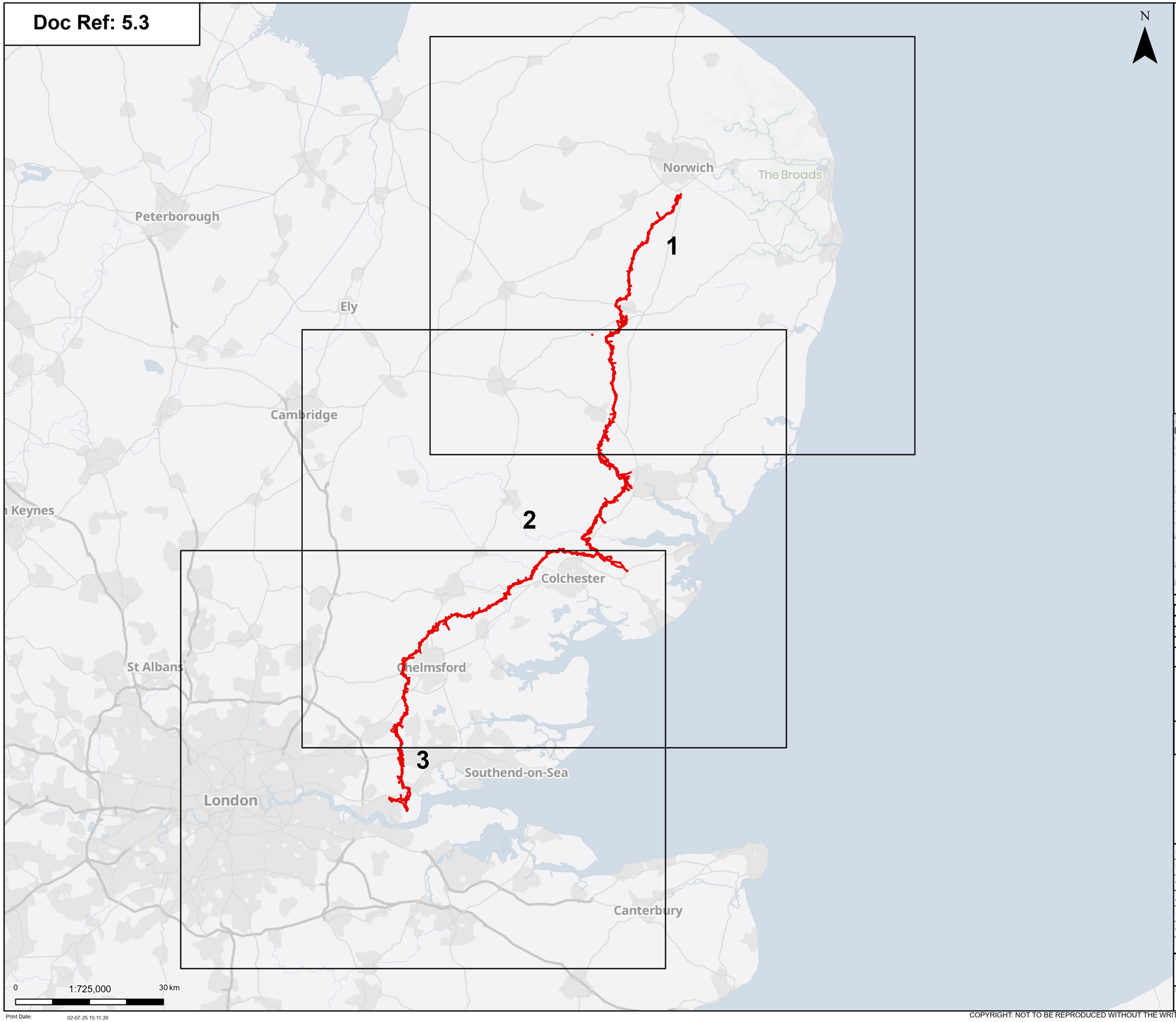
Yours faithfully,

[redacted]
Sustainable Development Senior Officer – West Anglia

Appendix C. Figures

nationalgrid

Doc Ref: 5.3



Order limits

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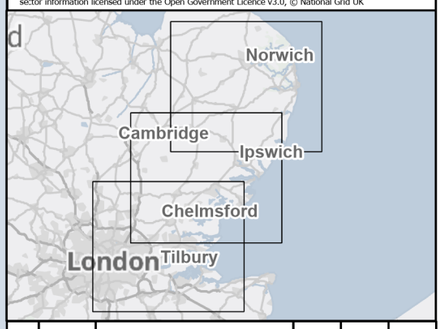


Rev	Date	Description	Drawn	Check	Approv
A	Aug 2025	FOR DCO APPLICATION	NB	AF	KB

nationalgrid

PROJECT:
Norwich to Tilbury

Planning Inspectorate App Number: EN020027
Regulation 5(2)(a)

Title:

Figure 1 - European Sites within 20 km of the Order Limits Overview

Designed	R. Booth	Date	21 Aug 25
Drawn	N. Banu	Date	21 Aug 25
Checked	A. Fell	Date	21 Aug 25
Approved	K. Burrows	Date	21 Aug 25
Scale:	1:725,000	Datum:	AOD
Original Size:	A3	Grid:	OS
Suitability Code:	A2	Project Number:	10059280

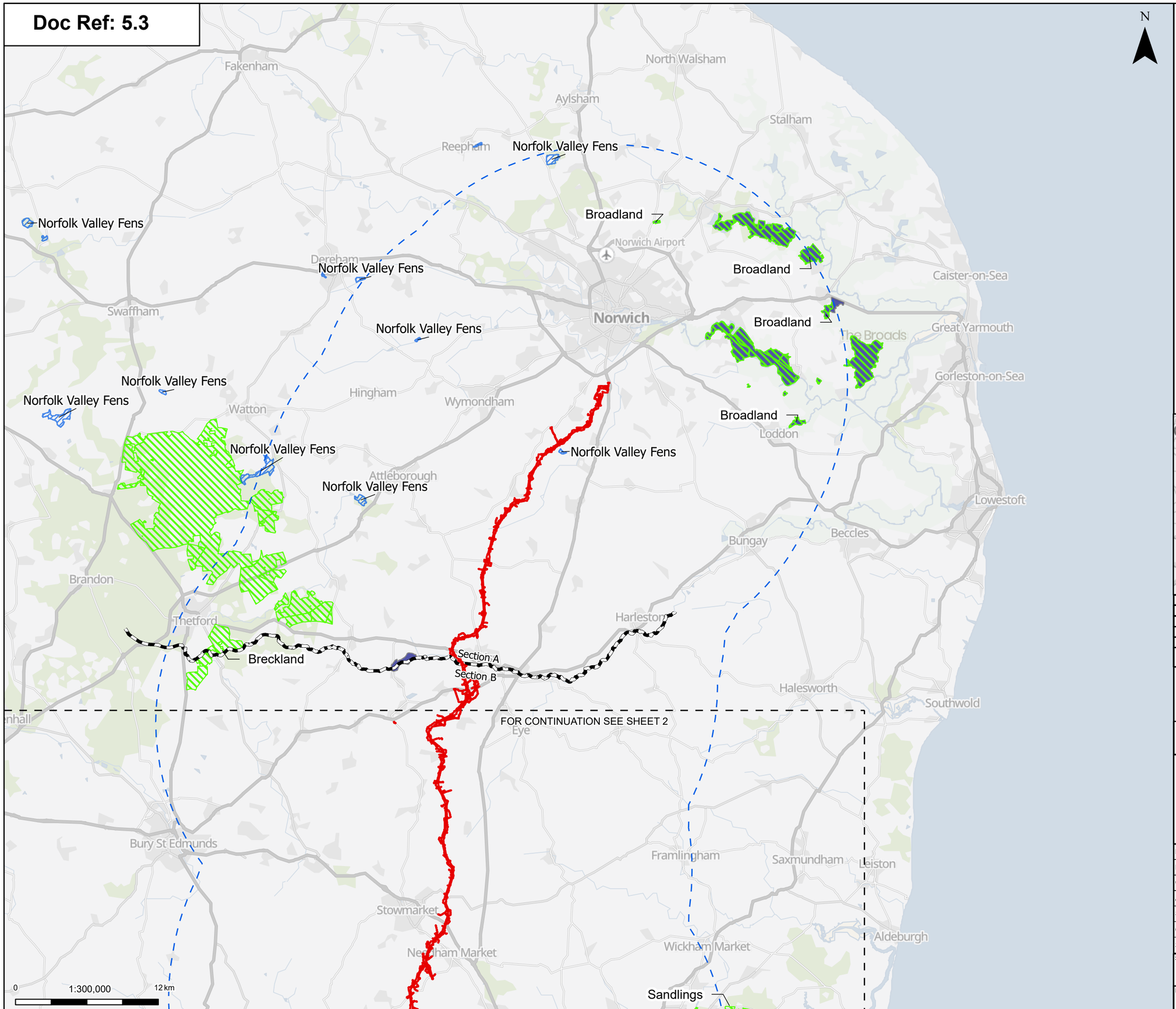
Suitability Description:
Accepted as Concept Stage

Drawing Number: 10059280-ARC-EBD-ZZ-DR-ZZ-00440

Revision: A

Print Date: 02-07-25 15:11:20

Doc Ref: 5.3



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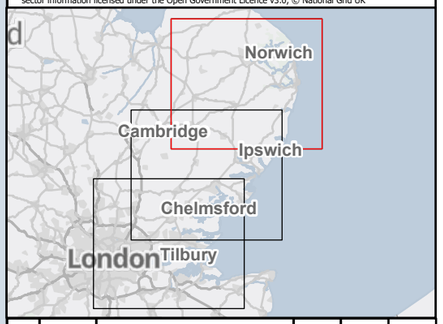
Order limits
Sheet index cutline
Project sections

Discipline specific constraints

20 km Study Area
Special Protection Areas
Ramsar Sites
Special Areas of Conservation



Rev	Date	Description	Drawn	Check	Approv
A	Aug 2025	FOR DCO APPLICATION	NB	AF	KB

nationalgrid

PROJECT: Norwich to Tilbury

Planning Inspectorate App Number: EN020027
Regulation 5(2)(a)

Title:

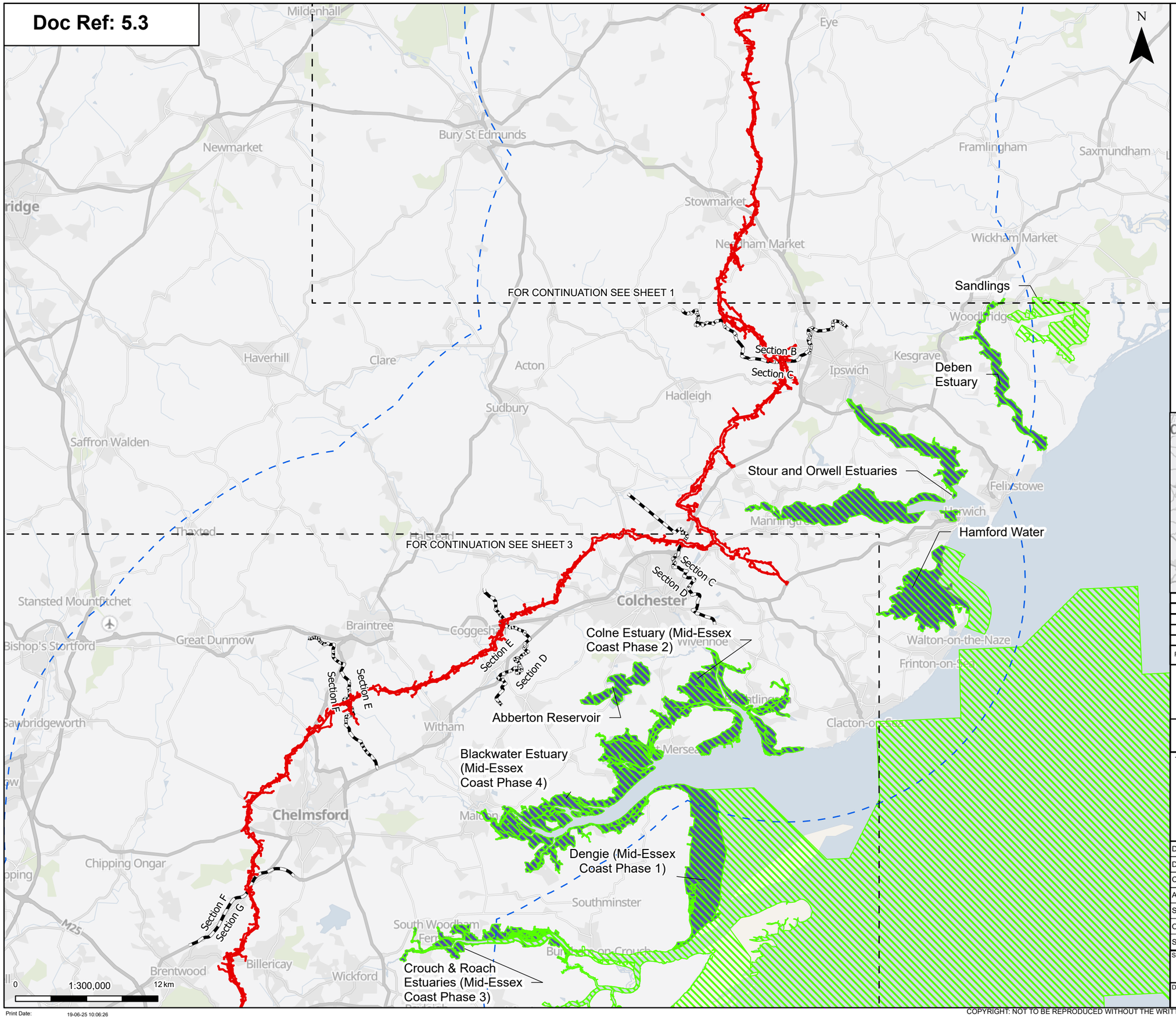
Figure 1 - European Sites within 20 km of the Order Limits
Page 1 of 3

Designed	R. Booth	Date	21 Aug 25
Drawn	N. Banu	Date	21 Aug 25
Checked	A. Fell	Date	21 Aug 25
Approved	K. Burrows	Date	21 Aug 25
Scale:	1:300,000	Datum:	AOD
Original Size:	A3	Grid:	OS
Suitability Code:	A2	Project Number:	10059280

Suitability Description:
Accepted as Concept Stage

Drawing Number: 10059280-ARC-EBD-ZZ-DR-ZZ-00440
Revision: A

Doc Ref: 5.3



Rev	Date	Description	Drawn	Check	Approv
A	Aug 2025	FOR DCO APPLICATION	NB	AF	KB

nationalgrid

PROJECT: Norwich to Tilbury

Planning Inspectorate App Number: EN020027
Regulation 5(2)(a)

Title:

Figure 1 - European Sites within 20 km of the Order Limits
Page 2 of 3

Designed	R. Booth	Date	21 Aug 25
Drawn	N. Banu	Date	21 Aug 25
Checked	A. Fell	Date	21 Aug 25
Approved	K. Burrows	Date	21 Aug 25
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Original Size:	A3	Grid:	OS
Suitability Code:	A2	Project Number:	10059280

Suitability Description:
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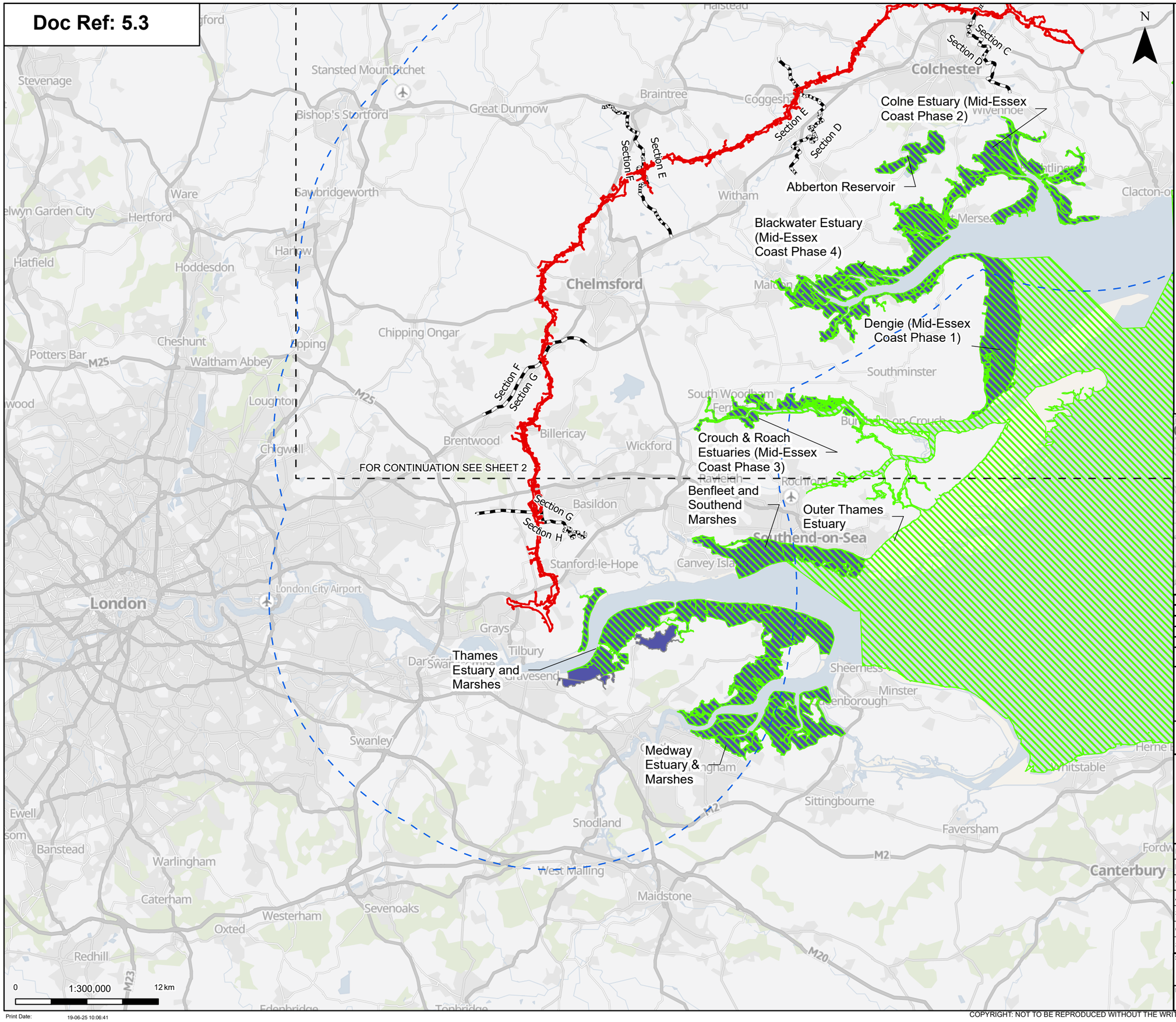
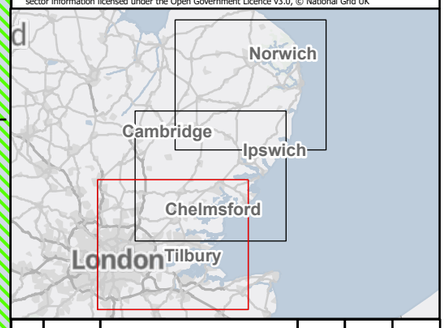


Order limits
Sheet index cutline
Project sections

Discipline specific constraints

20 km Study Area
Special Protection Areas
Ramsar Sites



Rev	Date	Description	Drawn	Check	Approv
A	Aug 2025	FOR DCO APPLICATION	NB	AF	KB

nationalgrid

PROJECT: Norwich to Tilbury

Planning Inspectorate App Number: EN020027
Regulation 5(2)(a)

Title:

Figure 1 - European Sites within 20 km of the Order Limits
Page 3 of 3

Designed	R. Booth	Date	21 Aug 25
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Approved	K. Burrows	Date	21 Aug 25
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Suitability Code:	A2	Project Number:	10059280

Suitability Description:
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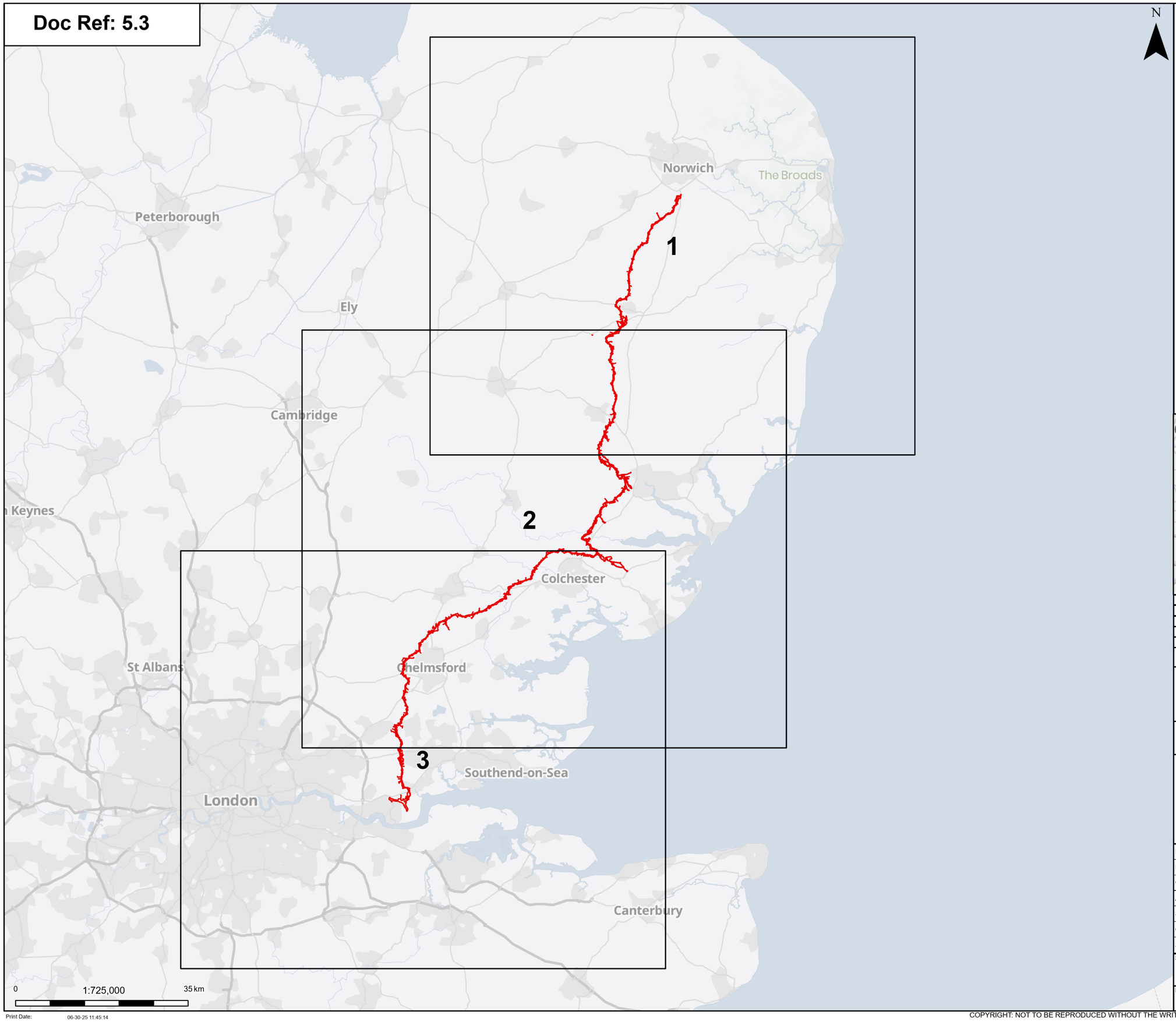

Order limits
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Rev	Date	Description	Drawn	Check	Approv
A	Aug 2025	FOR DCO APPLICATION	KF	AF	KB

nationalgrid

PROJECT:
Norwich to Tilbury

Planning Inspectorate App Number: EN020027
Regulation 5(2)(a)

Title:

Figure 2 - European Sites Considered for Habitat Regulations Assessment Screening Overview

Designed	R. Anderton	Date	21 Aug 25
Drawn	K. Fischer	Date	21 Aug 25
Checked	A. Fell	Date	21 Aug 25
Approved	K. Burrows	Date	21 Aug 25
Scale:	1:725,000	Datum:	AOD
Original Size:	A3	Grid:	OS
Suitability Code:	A2	Project Number:	10059280

Suitability Description:
Accepted as Concept Stage

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Revision: A

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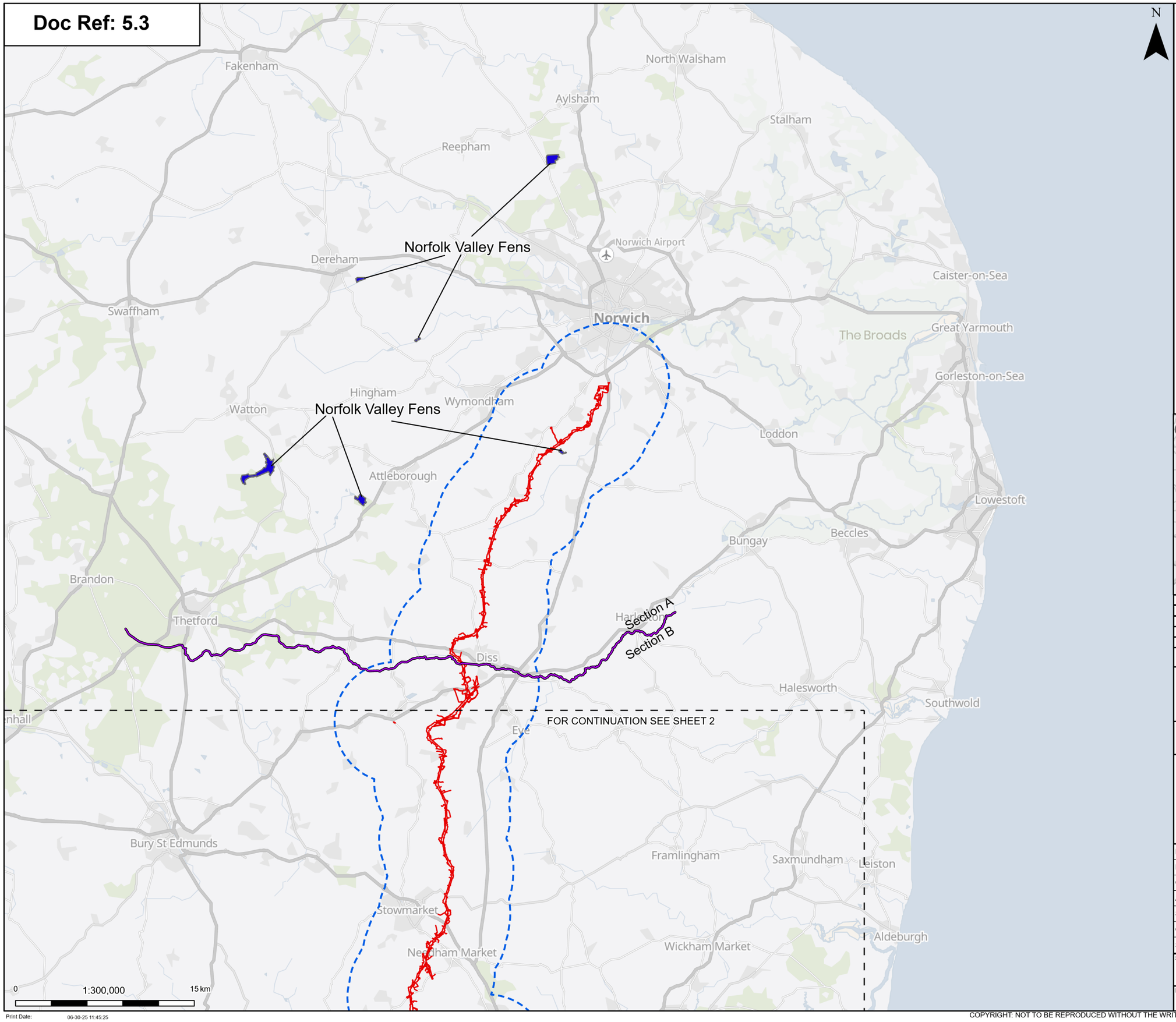
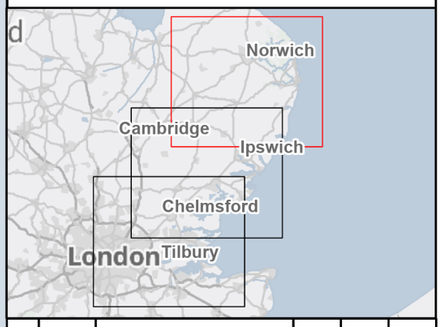


Order limits
Sheet index cutline
Project section line

Discipline specific constraints

5 km Zone of Influence
Special Areas of Conservation



Rev	Date	Description	Drawn	Check	Approv
A	Aug 2025	FOR DCO APPLICATION	KF	AF	KB

nationalgrid

PROJECT: Norwich to Tilbury

Planning Inspectorate App Number: EN020027
Regulation 5(2)(a)

Title:

Figure 2 - European Sites Considered for Habitat Regulations Assessment Screening
Page 1 of 3

Designed	R. Anderton	Date	21 Aug 25
Drawn	K. Fischer	Date	21 Aug 25
Checked	A. Fell	Date	21 Aug 25
Approved	K. Burrows	Date	21 Aug 25
Scale:	1:300,000	Datum:	AOD
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Suitability Code:	A2	Project Number:	10059280

Suitability Description:
Accepted as Concept Stage

Drawing Number: 10059280-ARC-EBD-ZZ-DR-ZZ-00387
Revision: A

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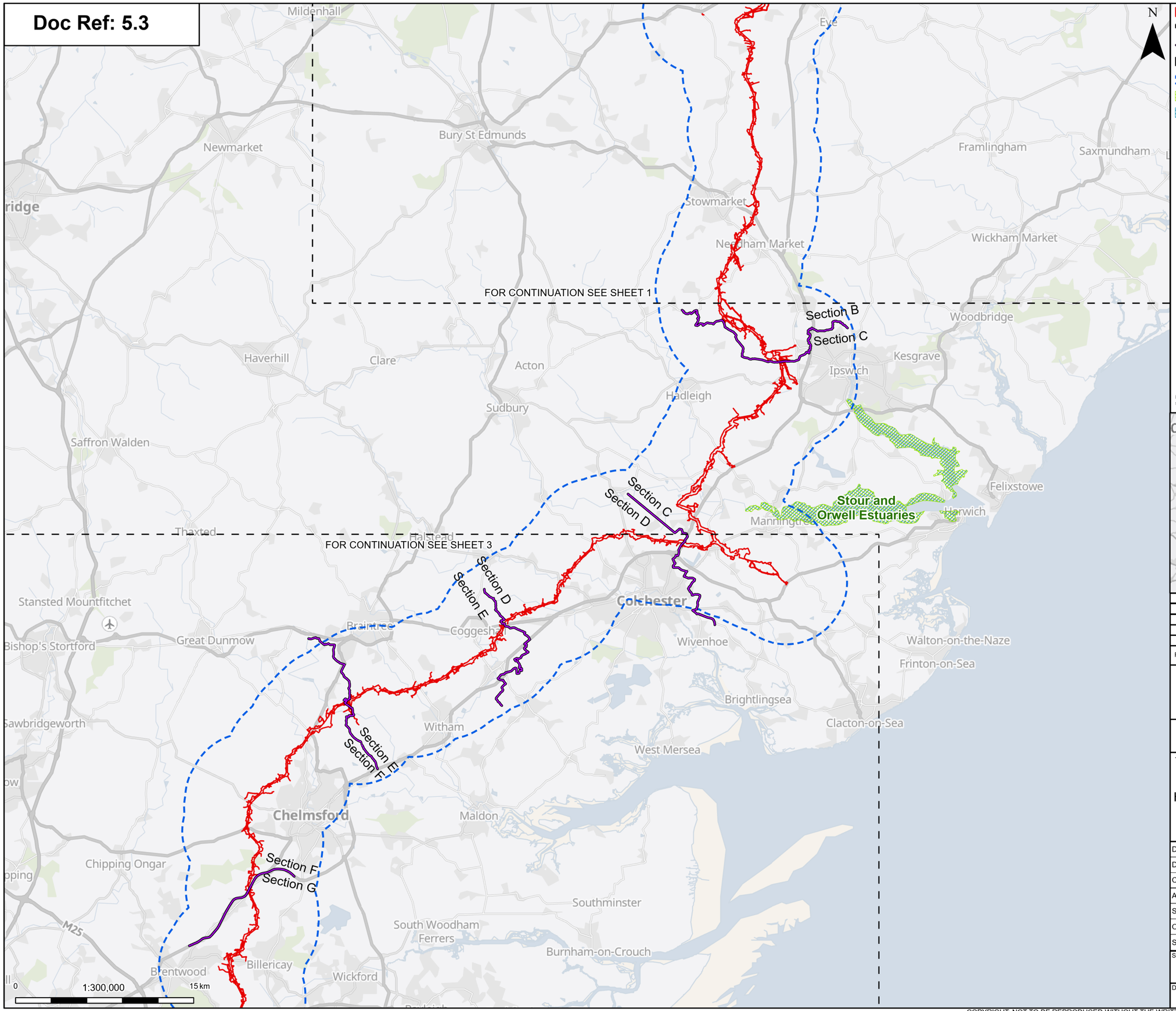
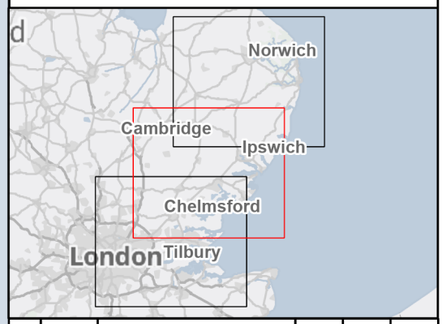
Doc Ref: 5.3



Order limits
Sheet index cutline
Project section line

Discipline specific constraints

5 km Zone of Influence
Ramsar
Special Protection Areas



Rev	Date	Description	Drawn	Check	Approv
A	Aug 2025	FOR DCO APPLICATION	KF	AF	KB

nationalgrid

PROJECT: Norwich to Tilbury

Planning Inspectorate App Number: EN020027
Regulation 5(2)(a)

Title:

Figure 2 - European Sites Considered for Habitat Regulations Assessment Screening Page 2 of 3

Designed	R. Anderton	Date	21 Aug 25
Drawn	K. Fischer	Date	21 Aug 25
Checked	A. Fell	Date	21 Aug 25
Approved	K. Burrows	Date	21 Aug 25
Scale:	1:300,000	Datum:	AOD
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Suitability Code:	A2	Project Number:	10059280

Suitability Description:
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Revision: A

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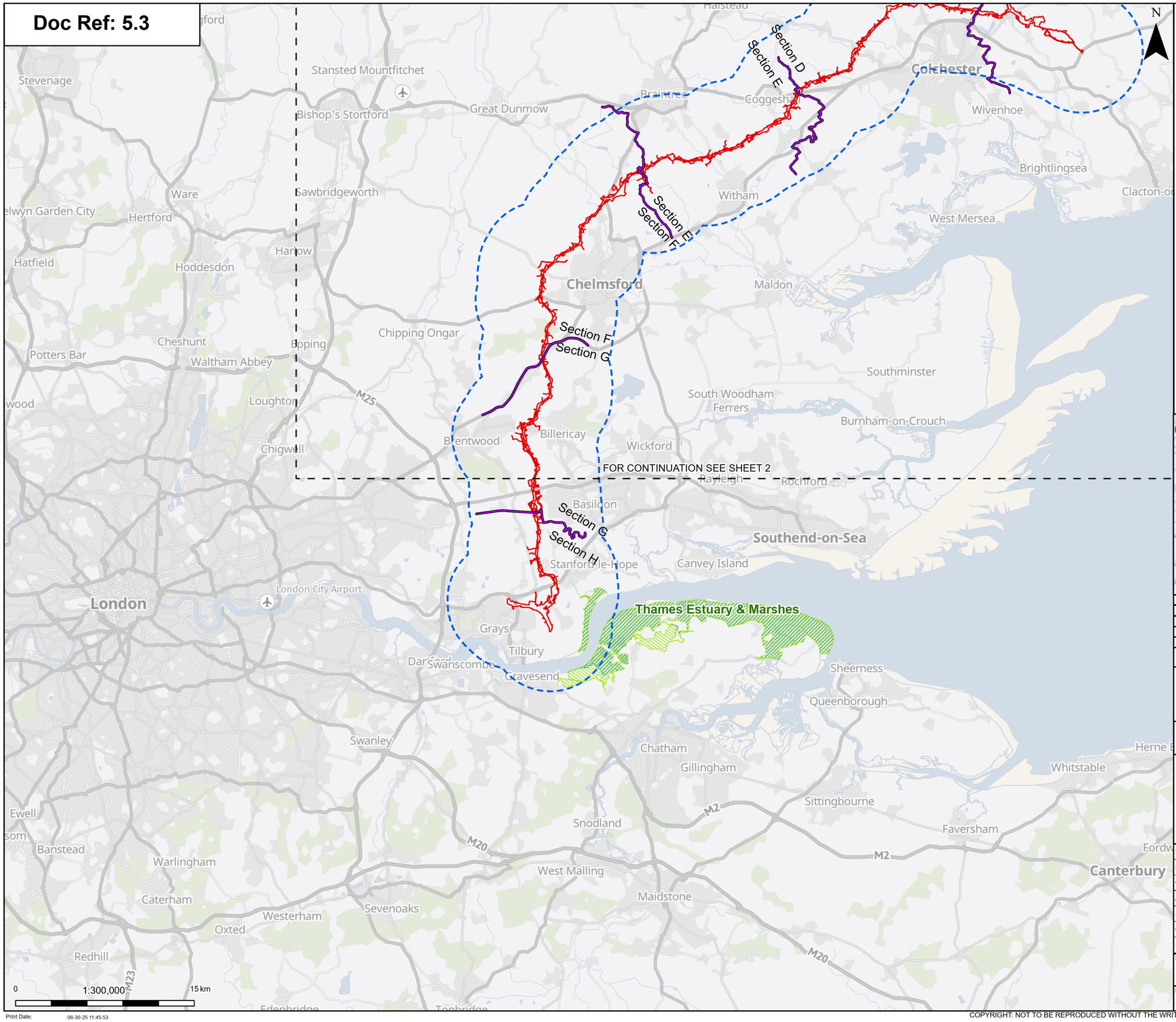

Order limits
Sheet index cutline
Project section line

Discipline specific constraints

5 km Zone of Influence
Ramsar
Special Protection Areas

Rev	Date	Description	Drawn	Check	Approv
A	Aug 2025	FOR DCO APPLICATION	KF	AF	KB

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PROJECT: Norwich to Tilbury

Planning Inspectorate App Number: EN020027
Regulation 5(2)(a)

Title:

Figure 2 - European Sites Considered for Habitat Regulations Assessment Screening Page 3 of 3

Designed	R. Anderton	Date	21 Aug 25
Drawn	K. Fischer	Date	21 Aug 25
Checked	A. Fell	Date	21 Aug 25
Approved	K. Burrows	Date	21 Aug 25
Scale:	1:300,000	Datum:	AOD
Original Size:	A3	Grid:	OS
Suitability Code:	A2	Project Number:	10059280

Suitability Description:
Accepted as Concept Stage

Drawing Number: 10059280-ARC-EBD-ZZ-DR-ZZ-00387
Revision: A

Print Date: 06-30-25 11:45:53

Doc Ref: 5.3

Ipswich District

East Suffolk District

Babergh District

Colchester District

Tendring District

N

0 1:100,000 5 km

Order limits
Functionally Linked Land

Discipline specific constraints

District Boundary
500 m Project Study Area
Special Protection Area 5 km Study Area
Special Protection Areas
Ramsar
Woodland
Built Up Extents

Fields suitable for Lapwing and Golden Plover

Under 10 ha
10-15 ha
15-20 ha
Over 20 ha

Notes:
GB Background: Contains OS data © Crown Copyright and database right 2025
Contains data from OS Zoomstack
World Imagery: Earthstar Geographics

Rev	Date	Description	Drawn	Check	Approv
A	Aug 2025	FOR DCO APPLICATION	XX	AF	KB

nationalgrid

PROJECT:
Norwich to Tilbury

Planning Inspectorate App Number: EN020027
Regulation 5(2)(a)

Title:

Figure 3 - Assessment of field sizes suitable for Lapwing and Golden Plover within 5km of the Stour and Orwell Estuaries SPA and Ramsar Site

Designed	R.Anderton	Date	21 Aug 25
Drawn	N. Banu	Date	21 Aug 25
Checked	A. Fell	Date	21 Aug 25
Approved	K. Burrows	Date	21 Aug 25
Scale:	1:100,000	Datum:	AOD
Original Size:	A3	Grid:	OS
Suitability Code:	A2	Project Number:	10059280

Suitability Description:
Accepted as Concept Stage

Drawing Number: 10059280-ARC-EBD-ZZ-DR-ZZ-00445
Revision: A

Print Date: 07-02-25 16:03:01

Doc Ref: 5.3

Trenchless Crossing: Higham Road

Survey Location 8

Trenchless Crossing: River Stour (north part)

Trenchless Crossing: River Stour (south part)

Trenchless Crossing: A12 highway crossing

Survey Location 10

Section C

Section D

TB25

TB20

TB15

TB10

TB5

TB1

Proposed EACN Substation

Trenchless Crossing: Railway crossing (east of Ardleigh)

0 1:30,000 1.5 km

N

Order limits
Project section line

Proposed project design details

Proposed full line tension gantry
Proposed standard lattice pylon location
Proposed overhead line alignment
Proposed underground cable alignment
Proposed DNO Substation
Proposed East Anglia Connection Node Substation

Environmental area
Other temporary and permanent construction and operational works

Discipline specific contraints

Functionally Linked Land

Note: The proposed overhead line alignment and proposed underground cable alignment together comprise the alignment.

Rev	Date	Description	Drawn	Check	Approv
A	Aug 2025	FOR DCO APPLICATION	NB	AF	KB

nationalgrid

PROJECT: Norwich to Tilbury

Planning Inspectorate App Number: EN020027
Regulation 5(2)(a)

Title:

Figure 4: Stour and Orwell Estuaries Functionally Linked Land within the Order Limits

Designed	R. Anderton	Date	21 Aug 25
Drawn	N. Banu	Date	21 Aug 25
Checked	K. Fell	Date	21 Aug 25
Approved	K. Burrows	Date	21 Aug 25
Scale:	1:30,000	Datum:	AOD
Original Size:	A3	Grid:	OS
Suitability Code:	A2	Project Number:	10059280

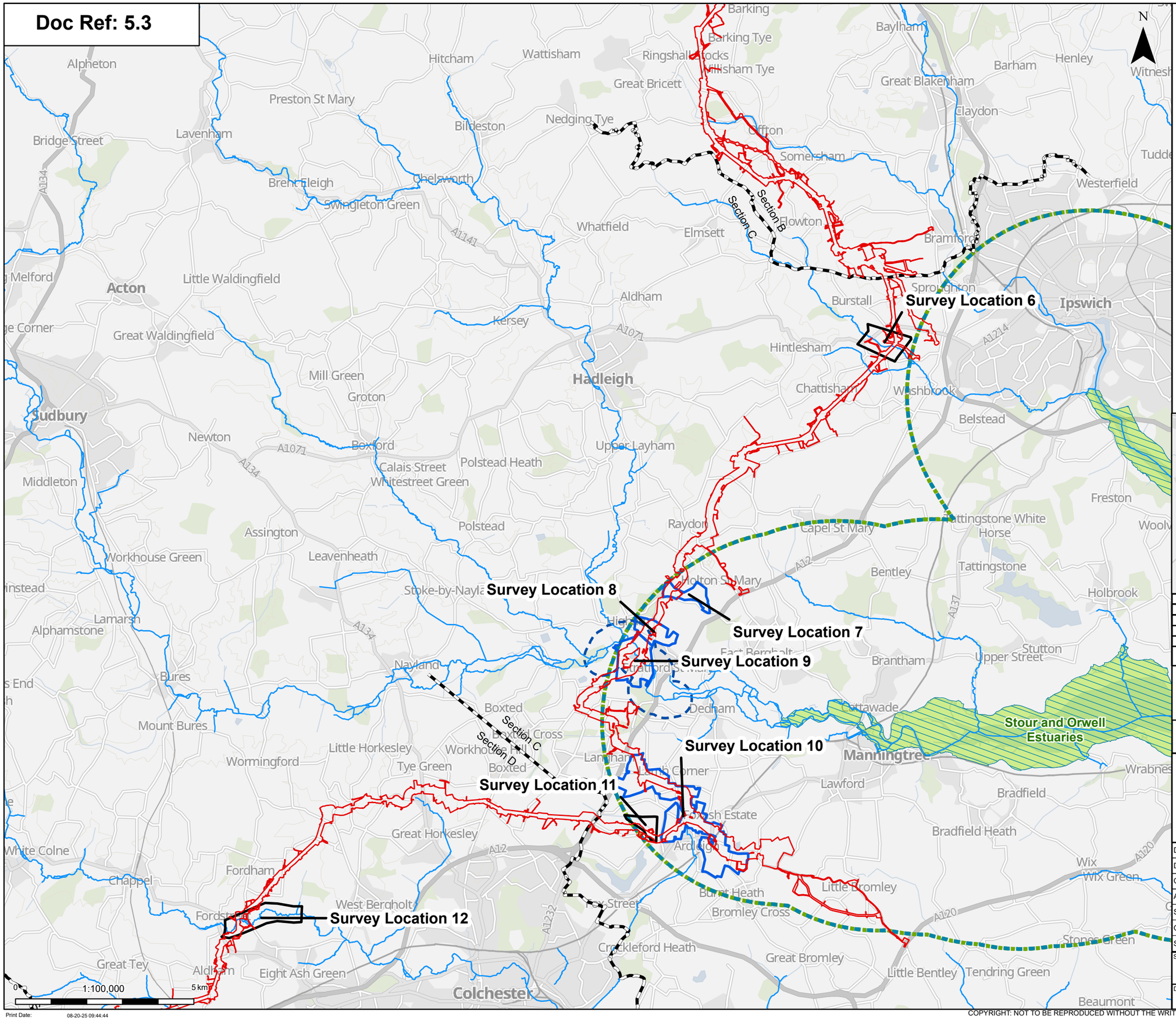
Suitability Description: Accepted as Concept Stage

Drawing Number: 10059280-ARC-EBD-ZZ-DR-ZZ-00439

Revision: A

Print Date: 06-27-25 16:53:16

Doc Ref: 5.3



Order limits
Project section line

Discipline specific constraints

Statutory Main River
Vantage Point (VP)
Transect
500 m Study Area - River Stour
Special Protection Area
Ramsar
Special Protection Area 5 km Study Area
Ramsar 5 km Study Area

Note: For further details regarding the design, please refer to Figures 4.1 (document reference 6.4.F1) and 4.2 (document reference 6.4.F2)

Rev	Date	Description	Drawn	Check	Approv
A	Aug 2025	FOR DCO APPLICATION	KF	AF	KB

nationalgrid

PROJECT: Norwich to Tilbury

Planning Inspectorate App Number: EN020027
Regulation 5(2)(a)

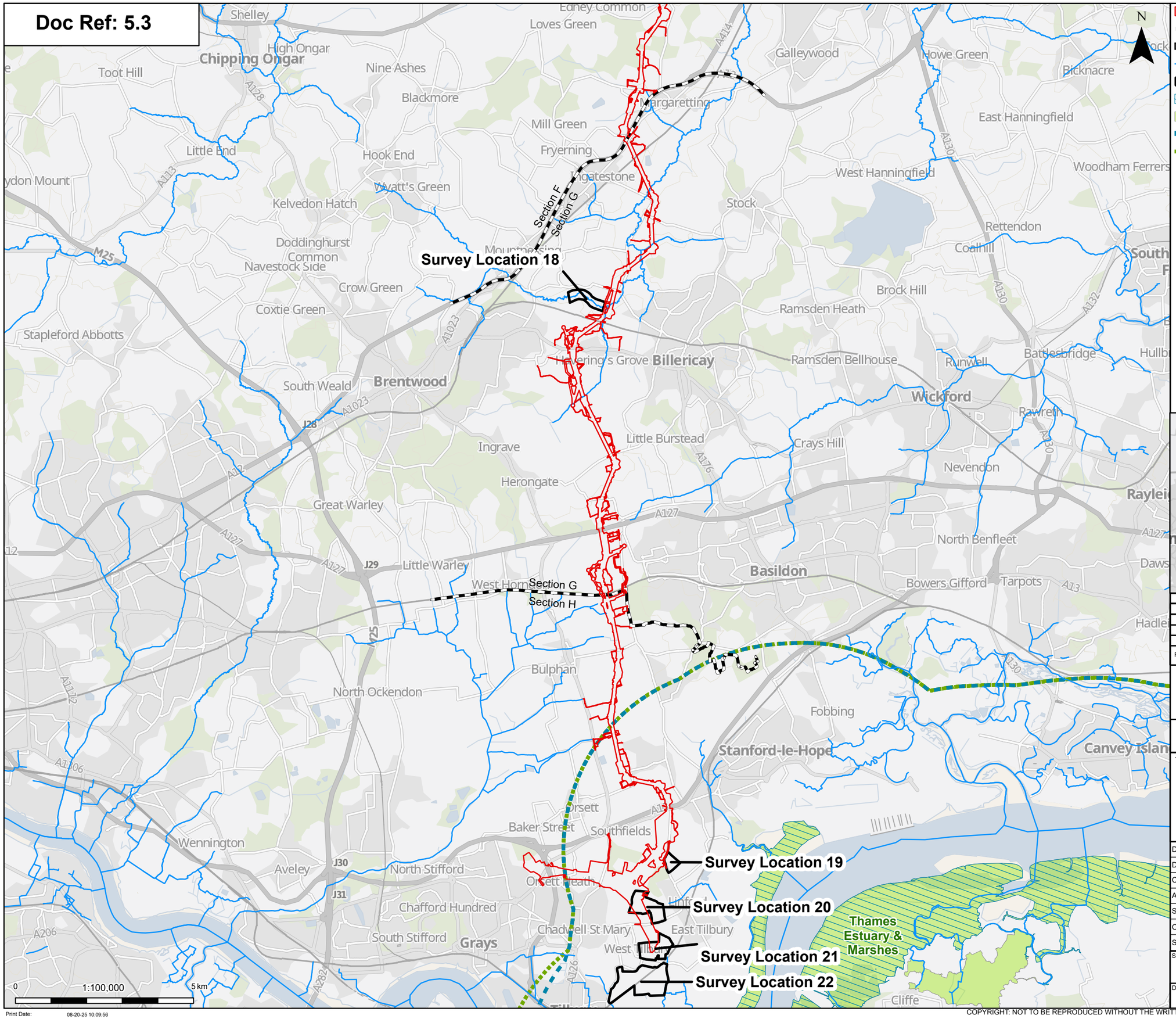
Title: Figure 5 - Ecology and Biodiversity Wintering/Passage Bird Survey Locations within 5 km of the Stour and Orwell Estuaries SPA / Ramsar Site

Designed	R. Anderton	Date	21 Aug 25
Drawn	K. Fischer	Date	21 Aug 25
Checked	A. Fell	Date	21 Aug 25
Approved	K. Burrows	Date	21 Aug 25
Scale:	1:100,000	Datum:	AOD
Original Size:	A3	Grid:	OS
Suitability Code:	A2	Project Number:	10059280

Suitability Description: Accepted as Concept Stage

Drawing Number: 10059280-ARC-EBD-ZZ-DR-ZZ-00848 | Revision: A

Doc Ref: 5.3



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Order limits
Project section line

Discipline specific constraints

Statutory Main River
Vantage Point (VP)
Special Protection Area
Ramsar
Special Protection Area 5 km Study Area
Ramsar 5 km Study Area

Note: For further details regarding the design, please refer to Figures 4.1 (document reference 6.4.F1) and 4.2 (document reference 6.4.F2)

Rev	Date	Description	Drawn	Check	Approv
A	Aug 2025	FOR DCO APPLICATION	KF	AF	KB

nationalgrid

PROJECT: Norwich to Tilbury

Planning Inspectorate App Number: EN020027
Regulation 5(2)(a)

Title:

Figure 6 - Ecology and Biodiversity Wintering/Passage Bird Survey Locations within 5 km of the Thames Estuary and Marshes SPA / Ramsar Site

Designed	R. Anderton	Date	21 Aug 25
Drawn	K. Fischer	Date	21 Aug 25
Checked	A. Fell	Date	21 Aug 25
Approved	K. Burrows	Date	21 Aug 25
Scale:	1:100,000	Datum:	AOD
Original Size:	A3	Grid:	OS
Suitability Code:	A2	Project Number:	10059280

Suitability Description: Accepted as Concept Stage

Drawing Number: 10059280-ARC-EBD-ZZ-DR-ZZ-00849

Revision: A

Print Date: 08-20-25 10:09:56

Doc Ref: 5.3

Proposed Tilbury North Substation

YYJ115

ZB20

YYJ120

ZB15RA

ZB15RB

ZB15RC

YYJ125R

TB260

Survey location 19

Survey location 20

TU(3)

TU(5)

TU(3)

PO(1)

LG(1)

ZB10

GP(1)

L(75)

YYJ130

L(43)

Survey location 22

N

0 1:20,000 1 km

Print Date: 08-20-25 10:20:24

Order limits

Proposed project design details

- Proposed full line tension gantry
- Proposed low duty gantry
- Existing pylon (modify)
- Proposed standard lattice pylon location
- Proposed overhead line alignment
- Proposed underground cable alignment
- Proposed Tilbury North Substation
- Proposed cable sealing end compound (CSEC)
- Environmental area
- Environmental mitigation
- Other temporary and permanent construction and operational works

Discipline specific constraints

- Survey Areas

Thames estuary and marshes SPA / Ramsar assembledge species

- 16/11/2023
- 08/12/2023
- 11/01/2024
- 23/01/2024
- 08/02/2024
- 20/02/2024

GP - Golden Plover
L - Lapwing
LG - Little Grebe
PO - Pochard
TU - Tufted Duck

Note: The proposed overhead line alignment and proposed underground cable alignment together comprise the alignment. For further details regarding the design, please refer to Figures 4.1 (document reference 6.4.F1) and 4.2 (document reference 6.4.F2)

Rev	Date	Description	Drawn	Check	Approv
A	Aug 2025	FOR DCO APPLICATION	KF	AF	KB

nationalgrid

PROJECT: Norwich to Tilbury

Planning Inspectorate App Number: EN020027
Regulation 5(2)(a)

Title:

Figure 7 - Thames Estuary and Marshes SPA / Ramsar Site Assemblage Species Results

Designed	R. Anderton	Date	21 Aug 25
Drawn	K. Fischer	Date	21 Aug 25
Checked	A. Fell	Date	21 Aug 25
Approved	K. Burrows	Date	21 Aug 25
Scale:	1:20,000	Datum:	AOD
Original Size:	A3	Grid:	OS
Suitability Code:	A2	Project Number:	10059280

Suitability Description:
Accepted as Concept Stage

Drawing Number: 10059280-ARC-EBD-ZZ-DR-ZZ-00850

Revision: A

Appendix D. Details of European Sites Scoped In

nationalgrid

Appendix D
Details of European Sites Scoped In

Table D.1 Details of European Sites scoped in

Site Name	Site Description	Qualifying Features
Norfolk Valley Fens SAC UK0012892	Norfolk Valley Fens SAC is one of two sites selected in East Anglia, in eastern England, where the main concentration of lowland Alkaline fens occurs. This site comprises a series of valley-head spring-fed fens. Such spring-fed flush fens are very rare in the lowlands. Most of the vegetation at this site is of the small sedge fen type, mainly referable to M13 *Schoenus nigricans – Juncus subnodulosus mire)*, but there are transitions to reedswamp and other fen and wet grassland types. The individual fens vary in their structure according to intensity of management and provide a wide range of variation. There is a rich flora associated with these fens, including species such as grass-of-Parnassus (*Parnassia palustris*), common butterwort (*Pinguicula vulgaris*), marsh helleborine (*Epipactis palustris*) and narrow-leaved marsh-orchid (*Dactylorhiza traunsteineri*). It is 616.48 ha and is located 52.5267N, 0.8561E	Primarily selected for its habitats and species as follows: **Habitats** • 7,230 Alkaline fens: • Norfolk Valley Fens is one of two sites selected in East Anglia, in eastern England, where the main concentration of lowland Alkaline fens occurs. This site comprises a series of valley-head spring-fed fens. Such spring-fed flush fens are very rare in the lowlands. Most of the vegetation at this site is of the small sedge fen type, mainly referable to M13 Schoenus nigricans, but there are transitions to reed swamp and other fen and wet grassland types. The individual fens vary in their structure according to intensity of management and provide a wide range of variation. There is a rich flora associated with these fens, including species such as grass-of-Parnassus, common butterwort (*Pinguicula vulgaris)*, marsh helleborine and narrow-leaved marsh-orchid. Annex I habitats present as a qualifying feature, but not a primary reason for selection of this site: • 4010 Northern Atlantic wet heaths with *Erica tetralix* • 4030 European dry heaths • 6210 Semi-natural dry grasslands and scrubland facies on calcareous substrates (*Festuco-Brometalia*) (* important orchid sites)

Site Name	Site Description	Qualifying Features
		• 6410 *Molinia* meadows on calcareous, peaty or clayey-silt-laden soils (*Molinion caeruleae*) • 7210 Calcareous fens with *Cladium mariscus* and species of the *Caricion davallianae* * Priority feature • 91E0 Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (Alno-Padion, *Alnion incanae*, *Salicion albae*) **Species** • 1,014 Narrow-mouthed whorl snail (*Vertigo angustior)*: • Norfolk Valley Fens represents narrow-mouthed whorl snail in East Anglia. At Flordon Common a strong population occurs in flushed grassland with yellow iris (*Iris pseudacorus)* maintained by light grazing. • 1,016 Desmoulin's whorl snail (*Vertigo moulinsiana)*: • Norfolk Valley Fens is one of several sites representing Desmoulin's whorl snail in East Anglia. Within Norfolk Valley Fens there are a number of marginal fens around pingos – pools that formed in hollows left when large blocks of ice melted at the end of the last Ice Age. These are very ancient wetlands and several support strong populations of (*V. moulinsiana)* as part of a rich assemblage of Red Data Book and Nationally Scarce species in standing water habitat.
Thames Estuary and Mars corhes Ramsar Site UK11069	A complex of brackish, floodplain grazing marsh ditches, saline lagoons and intertidal saltmarsh and mudflat. These habitats together support internationally important numbers of wintering waterfowl. The saltmarsh and grazing marsh are of international importance for their diverse assemblages of wetland plants and invertebrates.	Ramsar criterion 2: The site supports one endangered plant species and at least 14 nationally scarce plants of wetland habitats: • The site also supports more than 20 British Red Data Book invertebrates. Ramsar criterion 5: Assemblages of international importance:

Site Name	Site Description	Qualifying Features
	It is 5,553.59 ha and is located 51.2908 N, 0.3547 E.	Species with peak counts in winter: • 45,118 waterfowl (five-year peak mean 1998/1999 to 2002/2003) Ramsar criterion 6: species/populations occurring at levels of international importance. Qualifying Species/populations (as identified at designation): Species with peak counts in spring/autumn: • Ringed plover, (*Charadrius hiaticula)*, Europe/ Northwest Africa 595 individuals, representing an average of 1.8% of the Great Britain population (five-year peak mean 1998/1999 to 2002/2003) • Black-tailed godwit, Iceland/ West Europe 1,640 individuals, representing an average of 4.6% of the population (five-year peak mean 1998/1999 to 2002/2003) Species with peak counts in winter: • Grey plover, Eastern Atlantic/ Western Africa (wintering) 1,643 individuals, representing an average of 3.1% of the Great Britain population (five-year peak mean 1998/1999 to 2002/2003) • Red knot, Western and Southern Africa (wintering) 7,279 individuals, representing an average of 1.6% of the population (five-year peak mean 1998/1999 to 2002/2003) • Dunlin, West Siberia/ West Europe 15,171 individuals, representing an average of 1.1 % of the population (five-year peak mean 1998/1999 to 2002/2003) • Common redshank, 1,178 individuals, representing an average of 1% of the Great Britain population (five-year peak mean 1998/1999 to 2002/2003)
Thames Estuary and	Thames Estuary and Marshes SPA overlaps with the corresponding Ramsar Site but includes	Article 4.1 Qualification (79/409/EEC) Over winter the area regularly supports:

Site Name	Site Description	Qualifying Features
Marshes SPA UK9012021	approximately 700 ha more land. Overall, the SPA is a complex of brackish, floodplain grazing marsh ditches, saline lagoons and intertidal saltmarsh and mudflat. These habitats together support internationally important numbers of wintering waterfowl. The saltmarsh and grazing marsh are of international importance for their diverse assemblages of wetland plants and invertebrates. It is 4,802.47 ha and located 51.48555556 N, 0.596388889 E.	• *(Circus cyaneus)* 1% of the population in Great Britain five-year peak mean for 1993/1994 to 1997/1998 • *(Recurvirostra avosetta)* (Western Europe/ Western Mediterranean - breeding) 28.3% of the population in Great Britain five-year peak mean for 1993/1994 to 1997/1998 Article 4.2 Qualification (79/409/EEC) Over winter the area regularly supports: • *(Calidris alpina alpina)* (Northern Siberia/Europe/Western Africa) 2.1% of the population five-year peak mean for 1993/1994 to 1997/1998 • *(Calidris canutus)* (North-eastern Canada/ Greenland/ Iceland/ North-western Europe) 1.4% of the population five-year peak mean for 1993/1994 to 1997/1998 • *(Limosa limosa islandica)* (Iceland - breeding) 2.4% of the population five-year peak mean for 1993/1994 to 1997/1998 • *(Pluvialis squatarola)* (Eastern Atlantic - wintering) 1.7% of the population five-year peak mean for 1993/1994 to 1997/1998 • *(Tringa tetanus)* (Eastern Atlantic - wintering) 2.2% of the population five-year peak mean for 1993/1994 to 1997/1998 On passage the area regularly supports: • *(Charadrius hiaticula)* (Europe/ Northern Africa - wintering) 2.6% of the population five-year peak mean for 1993/1994 to 1997/1998 Article 4.2 Qualification (79/409/EEC): An Internationally Important Assemblage of Birds Over winter the area regularly supports:

Site Name	Site Description	Qualifying Features
		• 75,019 waterfowl (five-year peak mean 1991/1992 to 1995/10996) Including: (*Recurvirostra avosetta, Pluvialis squatarola, Calidris canutus, Calidris alpina alpina, Limosa limosa islandica, Tringa tetanus*)
Stour and Orwell Estuaries Ramsar Site UK11067	The Stour and Orwell Estuaries is a wetland of international importance, comprising extensive mudflats, low cliffs, saltmarsh and small areas of vegetated shingle on the lower reaches. It provides habitats for an important assemblage of wetland birds in the non-breeding season and supports internationally important numbers of wintering and passage wildfowl and waders. The site also holds several nationally scarce plants and British Red Data Book invertebrates. The Ramsar is 3676.92 ha in size roughly located 051 57 16 N, 001 09 38 E	Ramsar criterion 2: Contains seven nationally scarce plants: • stiff saltmarsh-grass • small cord-grass • perennial glasswort • lax-flowered sea lavender and • the eelgrasses Contains 5 British Red Data Book invertebrates: • the muscid fly • the horsefly • two spiders and • the Endangered swollen spire snail Ramsar criterion 5: Assemblages of international importance: Species with peak counts in winter: • 63,017 waterfowl (five-year peak mean 1998/1999 to 2002/2003) Ramsar criterion 6: species/populations occurring at levels of international importance. Qualifying Species/ populations (as identified at designation): Species with peak counts in spring/autumn: • Common redshank, 2,588 individuals, representing an average of 2% of the population (five-year peak mean 1995/1996 to 1999/2000) Species with peak counts in winter: • Dark-bellied brent goose, (*Branta bernicla bernicla)*, 2,627 individuals, representing an average of 1.2% of the population (five-year peak mean 1995/1996 to1999/2000)

Site Name	Site Description	Qualifying Features
		• Northern pintail, (*Anas acuta)*, Northwest Europe 741 individuals, representing an average of 1.2% of the population (five-year peak mean 1995/1996 to 1999/2000) • Grey plover, Eastern Atlantic/ Western Africa (wintering) 3,261 individuals, representing an average of 1.3% of the population (five-year peak mean 1995/1996 to 1999/2000) • Red knot, Western and Southern Africa (wintering) 5,970 individuals, representing an average of 1.3% of the population (five-year peak mean 1995/1996 to 1999/2000) • Dunlin, Western Siberia/ Western Europe 19,114 individuals, representing an average of 1.4% of the population (five-year peak mean 1995/1996 to 1999/2000) • Black-tailed godwit, Iceland/ Western Europe 2,559 individuals, representing an average of 7.3% of the population (five-year peak mean 1995/1996 to 1999/2000) • Common redshank, 3,687 individuals, representing an average of 2.8% of the population (five-year peak mean 1995/1996 to 1999/2000)
Stour and Orwell Estuaries SPA UK9009121	The Stour and Orwell Estuaries is a wetland of international importance, comprising extensive mudflats, low cliffs, saltmarsh and small areas of vegetated shingle on the lower reaches. It provides habitats for an important assemblage of wetland birds in the non-breeding season and supports internationally important numbers of wintering and passage wildfowl and waders. The site also holds several nationally scarce plants and British Red Data Book invertebrates.	Article 4.1 Qualification (79/409/EEC) During the breeding season the area regularly supports: • Pied avocet (Western Europe/ Western Mediterranean - breeding) 3.6% of the population in Great Britain five-year peak mean 1996 to 2000 Article 4.2 Qualification (79/409/EEC) Over winter the area regularly supports: • Northern pintail (North-western Europe) 1.2% of the population 5-

Site Name	Site Description	Qualifying Features
	Its boundary and location are the same as the Stour and Orwell Estuaries Ramsar Site.	year peak mean 1995/1996 to 1999/2000 • Brent goose (Western Siberia/ Western Europe) 1.2% of the population 5-year peak mean 1995/1996 to 1999/2000 • Dunlin (Northern Siberia/ Europe/ Western Africa) 1.4% of the population 5-year peak mean 1995/1996 to 1999/2000 • Red knot (North-eastern Canada/ Greenland/ Iceland/ North-western Europe) 1.3% of the population 5-year peak mean 1995/1996 to 1999/2000 • Black-tailed godwit (Iceland - breeding) 7.3% of the population 5-year peak mean 1995/1996 to 1999/2000 • Grey plover (Eastern Atlantic - wintering) 1.3% of the population 5-year peak mean 1995/1996 to 1999/2000 • Common redshank (Eastern Atlantic - wintering) 2.8% of the population five-year peak mean 1995/1996 to 1999/2000 On passage the area regularly supports: • Common redshank (Eastern Atlantic - wintering) 2% of the population 5-year peak mean 1995/1996 to 1999/2000 Article 4.2 Qualification (79/409/EEC): An Internationally Important Assemblage of Birds Over winter the area regularly supports: • 63,017 waterfowl (five-year peak mean 1991/1992 to 1995/1996) Including: great crested grebe, cormorant, brent goose, common shelduck, Eurasian wigeon, gadwall, northern pintail, goldeneye, common ringed plover, grey plover, northern lapwing, red knot, dunlin, black-

Site Name	Site Description	Qualifying Features
		tailed godwit, curlew, common redshank, turnstone.
Colne Estuary (Mid-Essex Coast Phase 2) Ramsar Site UK11015	Colne Estuary is a comparatively short and branching estuary, with 5 tidal arms which flow into the main river channel. The estuary has a narrow intertidal zone predominantly composed of flats of fine silt with mudflat communities typical of south-eastern estuaries. The estuary is of international importance for wintering Brent Geese and Black-tailed Godwit and of national importance for breeding Little Terns and 5 other species of wintering waders and wildfowl. The variety of habitats which include mudflat, saltmarsh, grazing marsh, sand and shingle spits, disused gravel pits and reedbeds, support outstanding assemblages of invertebrates and plants. It is 2,719.93 ha in size and located 51.81583333 N, 0.96 E.	Ramsar criterion 1: The site is important due to the extent and diversity of saltmarsh present. • This site, and the four other sites in the Mid-Essex Coast complex, includes a total of 3,237 ha, that represent 70% of the saltmarsh habitat in Essex and 7% of the total saltmarsh in Britain. Ramsar criterion 2: The site supports 12 species of nationally scarce plants and at least 38 British Red Data Book invertebrate species. Ramsar criterion 3: This site supports a full and representative sequences of saltmarsh plant communities covering the range of variation in Britain. Ramsar criterion 5: Assemblages of international importance: Species with peak counts in winter: • 32,041 waterfowl (five-year peak mean 1998/1999 to 2002/2003) Ramsar criterion 6: species/populations occurring at levels of international importance. Qualifying Species/populations with peak counts in winter: • Dark-bellied brent goose – 3,165 individuals, representing an average of 1.4% of the population (five-year peak mean 1998/1999 to 2002/2003) • Common redshank – 1,624 individuals, representing an average of 1.3% of the Great Britain population (five-year peak mean 1998/1999 to 2002/2003) Species/populations identified subsequent to designation for possible future consideration under criterion 6. Species with peak counts in winter: Black-tailed godwit (Iceland/ Western Europe) - 402 individuals,

Site Name	Site Description	Qualifying Features
		representing an average of 1.1% of the population (five-year peak mean 1998/1999 to 2002/2003)
Colne Estuary (Mid-Essex Coast Phase 2) SPA UK9009243	The Location and boundary of the SPA is the same as the Ramsar site; 2,719.93 ha in size and located 51.81583333 N, 0.96 E. Colne Estuary is a comparatively short and branching estuary, with 5 tidal arms which flow into the main river channel. The estuary has a narrow intertidal zone predominantly composed of flats of fine silt with mudflat communities typical of south-eastern estuaries. The estuary is of international importance for wintering Brent Geese and Black-tailed Godwit and of national importance for breeding Little Terns and 5 other species of wintering waders and wildfowl. The variety of habitats which include mudflat, saltmarsh, grazing marsh, sand and shingle spits, disused gravel pits and reedbeds, support outstanding assemblages of invertebrates and plants.	Article 4.1 Qualification (79/409/EEC) During the breeding season the area regularly supports: • Little tern *(Sterna albifrons)* (Eastern Atlantic - breeding) at least 1.6% of the Great Britain breeding population five-year mean, 1992 to 1996 Over winter the area regularly supports: • Hen harrier up to 2.5% of the Great Britain population No count period specified. Article 4.2 Qualification (79/409/EEC) During the breeding season the area regularly supports: • Common pochard*, (Aythya ferina)* (North-western/ North-eastern Europe) up to 6% of the population in Great Britain five-year mean, 1987 to 1991 • Common ringed plover (Europe/ Northern Africa - wintering) up to 1.6% of the population in Great Britain five-year mean, 1987 to 1991 Over winter the area regularly supports: • Dark-bellied brent goose (Western Siberia/ Western Europe) 1.6% of the population five-year peak mean 1991/1992 to 1995/1996 • Common redshank (Eastern Atlantic - wintering) 1.2% of the population five-year peak mean 1991/1992 to 1995/1996 Article 4.2 Qualification (79/409/EEC): An Internationally Important Assemblage of Birds Over winter the area regularly supports:

Site Name	Site Description	Qualifying Features
		• 38,600 waterfowl (five-year peak mean 1991/1992 to 1995/1996) Including: Dark-bellied brent goose, Common redshank
Abberton Reservoir Ramsar Site UK11001	Abberton Reservoir is a large storage reservoir built in a long shallow valley. It is the largest freshwater body in Essex and is one of the most important reservoirs in Britain for wildfowl. It is less than 8 km from the coast and its primary role is as a roost for the local estuarine wildfowl population. The boundary and location is the same as the existing protected area. It is 726.2 ha and located 51.4937 N, 0.5222 E.	Ramsar criterion 5: Species with peak counts in winter: • 23,787 waterfowl (five-year peak mean 1998/1999 to 2002/2003) Ramsar criterion 6: species/populations occurring at levels of international importance. Qualifying Species/populations (as identified at designation): Species with peak counts in spring/autumn: • Gadwall, (*Anas strepera strepera)*, Northwestern Europe 550 individuals, representing an average of 3.2% of the Great Britain population (five-year peak mean 1998/1999 to 2002/2003) • Northern shoveler, (*Anas clypeata)*, Northwestern and Central Europe 377 individuals, representing an average of 2.5% of the Great Britain population (five-year peak mean 1998/1999 to 2002/2003) Species with peak counts in winter: • Eurasian wigeon, (*Anas Penelope)*, Northwestern Europe 2,888 individuals, representing an average of 1.6% of the population (five-year peak mean 1991/1992 to 1995/1996) Species/populations identified subsequent to designation for possible future consideration under criterion 6. Species with peak counts in spring/ autumn: • Mute swan, (*Cygnus olor)*, Britain 387 individuals, representing an average of 1% of the population (five-year peak mean 1998/1999 to 2002/2003) • Common pochard, Northeastern and Northwestern Europe 4,373 individuals, representing an

Site Name	Site Description	Qualifying Features
		average of 1.2% of the population (five-year peak mean 1998/1999 to 2002/2003)
Abberton Reservoir SPA UK9009141	Abberton Reservoir is a large storage reservoir built in a long shallow valley. It is the largest freshwater body in Essex and is one of the most important reservoirs in Britain for wildfowl. It is less than 8 km from the coast and its primary role is as a roost for the local estuarine wildfowl population. It is 726.2 ha and located 51.4937 N, 0.5222 E.	Article 4.2 Qualification: Over the breeding season the area regularly supports • Cormorant (*Phalacrocorax carbo)* 5% of the population in Great Britain five-year peak mean of 161 pairs 2013 to 2017. • Avocet (Western Europe/Western Mediterranean - breeding) 28.3% of the population in Great Britain five-year peak mean for 1993/1993 to 1997/1998 Article 4.2 Qualification: During the non-breeding season, the area regularly supports: • Wigeon 3% of the population in Great Britain between 1985 and 1993 with a five-year peak mean of 2,300 individuals 2012/2013 to 2016/2017. • Gadwall population in 1991 of 280 individuals represented 8% of the Great Britain population. Current population of 179 individuals based on a five-year peak mean from 2012 to 2017 showed a 62.75% decrease. • Great crested grebe (An estimate of 694 individuals, based on a five-year peak mean from 2012 to 2017. • Mute swan an estimate of 162 individuals based on a five-year peak mean from 2012 to 2017. • Teal an estimated 4,987 individuals based on a five-year peak mean from 2012 to 2017. • Pochard an estimated 1,648 individuals based on a five-year peak from 2012 to 2017. • Tufted duck an estimated 1,733 individuals based on a five-year peak mean from 2012 to 2017.

Site Name	Site Description	Qualifying Features
		• Common goldeneye an estimated 381 individuals based on a five-year peak mean from 2012 to 2017. • Coot an estimated 2,833 individuals based on a five-year peak mean from 2012 to 2017. During the non-breeding season, the SPA regularly supports an assemblage of waterfowl of more than 20,000 birds. The main individual component species of the assemblage are listed below: Wigeon; gadwall; mute swan; shoveler; teal; pochard; tufted duck; goldeneye; coot; northern pintail; great crested grebe; smew; cormorant; lapwing; golden plover; ruff.
Broadland Ramsar Site UK11010	Broadland is a low-lying wetland complex straddling the boundaries between east Norfolk and northern Suffolk. The area includes the river valley systems of the Bure, Yare and Waveney and their major tributaries. The open distinctive landscape comprises a complex and interlinked mosaic of wetland habitats including open water, reedbeds, carr woodland, grazing marsh and fen meadow. The region is important for recreation, tourism, agriculture and wildlife. It follows the same boundary as the protected area, which is 5,488.61 ha and located 52.4356 N, 1.36 E.	Ramsar criterion 2: The site supports a number of rare species and habitats within the biogeographical zone context, including the following Habitats Directive Annex I features • H7210 Calcareous fens with great fen-sedge and species of the Davall's sedge, (*Caricion davallianae).* Calcium-rich fen dominated by great fen sedge (saw sedge). • H7230 Alkaline fens Calcium-rich springwater-fed fens. • H91E0 Alluvial forests with Alder and Ash (*Alno-Padion, Alnion incanae, Salicion albae*). Alder woodland on floodplains, and the Annex II species • S1016 Desmoulin`s whorl snail, (*Vertigo moulinsiana)* • S1355 Otter, (*Lutra lutra)* • S1903 Fen orchid, (*Liparis loeselii)* The site supports outstanding assemblages of rare plants and invertebrates including nine British Red Data Book plants and 136 British Red Data Book invertebrates.

Site Name	Site Description	Qualifying Features
		Ramsar criterion 6: species/populations occurring at levels of international importance. Qualifying Species/populations with peak counts in winter: • Tundra swan (Northwestern Europe) - 196 individuals, representing an average of 2.4% of the Great Britain population (five-year peak mean 1998/1999 to 2002/2003) • Eurasian wigeon (Northwestern Europe) – 6,769 individuals, representing an average of 1.6% of the Great Britain population (five-year peak mean 1998/1999 to 2002/2003) • Gadwall (Northwestern Europe) - 545 individuals, representing an average of 3.1% of the Great Britain population (five-year peak mean 1998/1999 to 2002/2003) • Northern shoveler (Northwestern and Central Europe) - 247 individuals, representing an average of 1.6 % of the Great Britain population (five-year peak mean 1998/1999 to 2002/2003) Species/populations identified subsequent to designation for possible future consideration under criterion 6. Species with peak counts in winter: • Pink-footed goose (Greenland, Iceland/ UK) – 4,263 individuals, representing an average of 1.7% of the population (five-year peak mean 1998/1999 to 2002/2003) • Greylag goose (Iceland/ UK/ Ireland) – 1,007 individuals, representing an average of 1.1% of the population (Source period not collated)
Broadland SPA UK9009253	Broadland is a low-lying wetland complex straddling the boundaries between east Norfolk and northern Suffolk. The area includes the river	Article 4.1 Qualification (79/409/EEC) During the breeding season the area regularly supports:

Site Name	Site Description	Qualifying Features
	valley systems of the Bure, Yare and Waveney and their major tributaries. The open distinctive landscape comprises a complex and interlinked mosaic of wetland habitats including open water, reedbeds, carr woodland, grazing marsh and fen meadow. The region is important for recreation, tourism, agriculture and wildlife. It is 5,488.61 ha and located 52.4356 N, 1.36 E.	• Eurasian bittern (Europe - breeding) at least 10% of the Great Britain breeding population 3 year mean 1996 to 1998 • Western marsh harrier, 10.2% of the Great Britain breeding population five-year mean, 1987/1998 to 1991/1992 Over winter the area regularly supports: • Hen harrier *(Circus cyaneus)* 2.9% of the Great Britain population five-year peak mean 1987/1988 to 1991/1992 • Tundra swan (Western Siberia/North-eastern and North-western Europe) at least 8.2% of the Great Britain population Count, as at 1996/1997 • Whooper swan (Iceland/ UK/ Ireland) 1.8% of the Great Britain population Count, as at 1996/1997 Article 4.2 Qualification (79/409/EEC) Over winter the area regularly supports: • Gadwall (North-western Europe) 0.8% of the population five-year peak mean, 1991/1992 to 1995/1996
Breckland SPA UK9009201	The Breckland of Norfolk and Suffolk lies in the heart of East Anglia on largely sandy soils of glacial origin. In the nineteenth century the area was termed a sandy waste, with small patches of arable cultivation that were soon abandoned. The continental climate, with low rainfall and free-draining soils, has led to the development of dry heath and grassland communities. Much of Breckland has been planted with conifers throughout the twentieth century, and in part of the site, arable farming is the predominant land use. The remnants of dry heath and grassland which have survived these	Article 4.1 Qualification (79/409/EEC) • During the breeding season the area regularly supports: Eurasian stone-curlew (Western Europe - breeding) 60.1% of the Great Britain breeding population five-year mean (1994 to 1998) • European nightjar 12.2% of the Great Britain breeding population count at 1998 • Woodlark 28.7% of the Great Britain breeding population count as at 1997.

Site Name	Site Description	Qualifying Features
	recent changes support heathland breeding birds, where grazing by rabbits and sheep is sufficiently intensive to create short turf and open ground. These breeding birds have also adapted to live in forestry and arable habitats. Woodlark (*Lullula arborea*) and nightjar Caprimulgus europaeus breed in clear-fell and open heath areas, whilst stone curlews (*Burhinus oedicnemus*) establish nests on open ground provided by arable cultivation in the spring, as well as on Breckland grass-heath. It is 39,432.75 ha and located 52.50972 N, 0.75972 E. It partly overlaps Breckland SAC (7,544 ha).	
Blackwater Estuary (Mid-Essex Coast Phase 4) Ramsar Site UK11007	The Blackwater Estuary is the largest estuary in Essex north of the Thames and, is one of the largest estuarine complexes in East Anglia. Its mudflats, fringed by saltmarsh on the upper shores, support internationally and nationally important numbers of overwintering waterfowl. Shingle and shell banks and offshore islands are also a feature of the tidal flats. The surrounding terrestrial habitats; the sea wall, ancient grazing marsh and its associated fleet and ditch systems, plus semi-improved grassland are also of high conservation interest. This rich mosaic of habitats supports an outstanding assemblage of nationally scarce plants and a nationally important assemblage of rare invertebrates. There are 16 British Red Data Book species and 94 notable and local species. Its boundary is the same as the existing protected area, which is 4395.15 ha and located 51.4513 N, 0.5159 E.	Ramsar criterion 1: Qualifies by virtue of the extent and diversity of saltmarsh habitat present. • This site, and the four others in the Mid-Essex Coast complex, includes a total of 3,237 ha that represent 7% of the saltmarsh habitat in Essex and 7% of the total area of saltmarsh in Britain. Ramsar criterion 2: The invertebrate fauna is well represented and includes at least 16 British Red Data Book species. In descending order of rarity these are: Endangered: • Water beetle- Bembridge Beetle, (*Paracymus aeneus)* Vulnerable: • Damselfly- emerald spreadwing, *(Lestes dryas)* • Flies- (*Aedes flavescens, Erioptera bivittate),* large horsefly *(Hybomitra expollicata)* • Spiders- (*Heliophanus auratus, Trichopterna cito)* *Rare:* • Beetles- (*Baris scolopacea, Philonthus punctus, Graptodytes bilineatus, Malachius vulneratus*)

Site Name	Site Description	Qualifying Features
		• Flies- (*Campsicemus magius), Golden Samphire Gall-Fly (Myopites eximia*) • Moths- The bright wave *(Idaea ochrata*), Ground lackey (*Malacosoma castrensis*) • Spider- (*Euophrys*) Ramsar criterion 3: This site supports a full and representative sequences of saltmarsh plant communities covering the range of variation in Britain. Ramsar criterion 5: Assemblages of international importance Species with peak counts in winter: • 105,061 waterfowl (five-year peak mean 1998/1999 to 2002/2003) Ramsar criterion 6: Species/populations occurring at levels of international importance Qualifying species/populations with peak counts in winter: • Dark-bellied brent goose - 8,689 individuals, representing an average of 4% of the population (five-year peak mean 1998/1999 to 2002/2003) • Grey plover (Eastern Atlantic/ Western Africa - wintering) – 4,215 individuals, representing an average of 1.7% of the population (five-year peak mean 1998/1999 to 2002/2003) • Dunlin (Western Siberia/ Western Europe) – 27,655 individuals, representing an average of 2% of the population (five-year peak mean 1998/1999 to 2002/2003) • Black-tailed godwit (Iceland/ Western Europe) – 2,174 individuals, representing an average of 6.2% of the population (five-year peak mean 1998/1999 to 2002/2003) Species/populations identified subsequent to designation for

Site Name	Site Description	Qualifying Features
		possible future consideration under criterion 6. Species with peak counts in winter: • Common shelduck (Northwestern Europe) – 3,141 individuals, representing an average of 1% of the population (five-year peak mean 1998/1999 to 2002/2003) • European golden plover, Iceland and Faroes/ Eastern Atlantic) – 16,083 individuals, representing an average of 1.7 % of the population (five-year peak mean 1998/1999 to 2002/2003)
Blackwater Estuary (Mid-Essex Coast Phase 4) SPA UK9009245	The Blackwater Estuary is the largest estuary in Essex north of the Thames and, is one of the largest estuarine complexes in East Anglia. Its mudflats, fringed by saltmarsh on the upper shores, support internationally and nationally important numbers of overwintering waterfowl. Shingle and shell banks and offshore islands are also a feature of the tidal flats. The surrounding terrestrial habitats; the sea wall, ancient grazing marsh and its associated fleet and ditch systems, plus semi-improved grassland are also of high conservation interest. This rich mosaic of habitats supports an outstanding assemblage of nationally scarce plants and a nationally important assemblage of rare invertebrates. There are 16 British Red Data Book species and 94 notable and local species. It is 4,395.15 ha and located 51.4513 N, 0.5159 E.	Article 4.1 Qualification (79/409/EEC) During the breeding season the area regularly supports: • Little tern (Eastern Atlantic - breeding) at least 0.9 % of the Great Britain breeding population five-year mean, 1992 to 1996 Over winter the area regularly supports: • Hen harrier up to 2.5% of the Great Britain population five-year mean, 1987/1988 to 1991/1992 Article 4.2 Qualification (79/409/EEC) During the breeding season the area regularly supports: • Common pochard (North-western/ North-eastern Europe) up to 6 % of the population in Great Britain five-year mean, 1987-1991 • Common ringed plover (Europe/ Northern Africa - wintering) up to 1.6% of the population in Great Britain five-year mean, 1987 to 1991 Over winter the area regularly supports: • Brent goose (Western Siberia/ Western Europe) 5.1% of the population five-year peak mean 1991/1992 to 1995/1996 • Dunlin (Northern Siberia/ Europe/ Western Africa) 2.4% of the

Site Name	Site Description	Qualifying Features
		population five-year peak mean 1991/1992 to 1995/1996 • Common ringed plover (Europe/ Northern Africa - wintering) 0.7 % of the population five-year peak mean 1991/1992 to 1995/1996 • Black-tailed godwit (Iceland - breeding) 2% of the population five-year peak mean 1991/1992 to 1995/1996 • *Eurasian* curlew (Eastern Atlantic - wintering) 3% of the population five-year peak mean 1991/1992 to 1995/1996 Article 4.2 Qualification (79/409/EEC): An Internationally Important Assemblage of Birds Over winter the area regularly supports: • 109,964 waterfowl (five-year peak mean 1991/1992 to 1995/1996) Including: Brent goose, ringed plover, Eurasian curlew, dunlin, black-tailed godwit
Benfleet and Southend Marshes Ramsar Site UK11006	The site comprises extensive areas of saltmarshes, cockle shell banks, mud-flats, and grassland. These productive habitats in turn provide a wide range of feeding and roosting opportunities for internationally important numbers of wintering wildfowl and waders. Over winter, the area regularly supports 34,789 individual waterfowl (five-year peak mean 1991/1992 to 1995/1996) including: Dunlin, Ringed Plover, Oystercatcher, Knot, Grey Plover and Dark-bellied Brent Goose. Its boundary is the same as the existing SPA, which is 2283.94 ha and located 51.5283 N, 0.683 E.	Ramsar criterion 5: Assemblages of international importance: Species with peak counts in winter • 32,867 waterfowl (five-year peak mean 1998/1999 to 2002/2003) Ramsar criterion 6: species/populations occurring at levels of international importance. Qualifying species/populations with peak counts in spring/ autumn: • Dark-bellied brent goose - 4,532 individuals, representing an average of 2.1% of the population (five-year peak mean 1998/1999 to 2003/2003) Qualifying species/populations with peak counts in winter: • Grey plover (E Atlantic/ Western African- wintering) - 1,710 individuals, representing an average of 3.2% of the Great

Site Name	Site Description	Qualifying Features
		Britain population (five-year peak mean 1998/1999 to 2002/2003) • Red knot (Western and Southern Africa) - 6,307 individuals, representing an average of 1.X4% of the population (five-year peak mean 1998/1999 to 2002/2003) Species/populations identified subsequent to designation for possible future consideration under criterion 6. Species with peak counts in winter: Dunlin (Western Siberia/Western Europe) – 17,591 individuals, representing an average of 1.3% of the population (five-year peak mean 1998/1999 to 2002/2003)
Benfleet and Southend Marshes SPA UK9009171A	The site comprises extensive areas of saltmarshes, cockle shell banks, mud-flats, and grassland. These productive habitats in turn provide a wide range of feeding and roosting opportunities for internationally important numbers of wintering wildfowl and waders. Over winter, the area regularly supports 34,789 individual waterfowl (five-year peak mean 1991/1992 to 1995/1996) including: Dunlin, Ringed Plover, Oystercatcher, Knot, Grey Plover and Dark-bellied Brent Goose. It is 2,283.94 ha and located 51.5283 N, 0.683 E.	Article 4.2 Qualification (79/409/EEC): Over winter the area regularly supports • Dark-bellied brent goose (Western Siberia/ Western Europe) 1.3% of the population five-year peak mean 1991/1992 to 1995/1996 • Dunlin (Northern Siberia/ Europe/ Western Africa) 2.1% of the population in Great Britain five-year peak mean 1991/1992 to 1995/1996 • Red knot (North-eastern Canada/ Greenland/ Iceland/ North-western Europe) 2.6% of the population five-year peak mean 1991/1992 to 1995/1996 • Common ringed plover, (Europe/ Northern Africa - wintering) 1.3% of the population in Great Britain five-year peak mean 1991/1992 to 1995/1996 • Grey plover (Eastern Atlantic-wintering) 2.3% of the population five-year peak mean 1991/1992 to 1995/1996

Site Name	Site Description	Qualifying Features
		Article 4.2 Qualification (79/409/EEC): An internationally important assemblage of birds. Over winter the area regularly supports • 34,789 waterfowl (five-year peak mean 1991/1992 to 1995/1996) including; dark-bellied brent goose, common ringed plover, grey plover, red knot, dunlin
Crouch and Roach Estuaries (Mid-Essex Coast Phase 3) Ramsar Site UK11058	The Rivers Crouch and Roach are situated in South Essex. The River Crouch occupies a shallow valley between two ridges of London Clay, whilst the River Roach is set predominantly between areas of brick earth and loams with patches of sand and gravel. The intertidal zone along the Rivers Crouch and Roach is 'squeezed' between the sea walls of both banks and the river channel. This leaves a relatively narrow strip of tidal mud unlike other estuaries in the county, which, nonetheless, is used by significant numbers of birds. One species is present in internationally important numbers, and three other species of wader and wildfowl occur in nationally important numbers. Additional interest is provided by the aquatic and terrestrial invertebrates and by an outstanding assemblage of nationally scarce plants. It follows the same boundary as the existing SPA, which is 1,735.58 ha and located 51.3816 N, 0.4010 E.	Ramsar criterion 2: Supports an appreciable assemblage of rare, vulnerable or endangered species or subspecies of plant and animal including; • 13 nationally scarce plant species: slender hare's ear (*Bupleurum tenuissimum)*, divided sedge, sea barley, golden-samphire (*Inula crithmoides)*, lax-flowered sea-lavender, curved hard-grass (*Parapholis incurve)*, Borrer's saltmarsh grass, stiff saltmarsh grass, spiral tasselweed (*Ruppia cirrhosa)*, one-flowered glasswort (*Salicornia pusilla)*, small cord-grass, shrubby sea-blite (*Suaeda vera)* and sea clover (*Trifolium squamosum)*. • Several important invertebrate species are also present on the site, including scarce emerald spreadwing damselfly, the shorefly (*Parydroptera discomyzina)*, the rare soldier fly (*Stratiomys singularior)*, the large horsefly, the beetles (*Graptodytes bilineatus)* and (*Malachius vulneratus)*, the ground lackey moth and (*Eucosoma catoprana)*. Ramsar criterion 5: Assemblages of international importance: Species with peak counts in winter: • 16,970 waterfowl (five-year peak mean 1998/1999 to 2002/2003)

Site Name	Site Description	Qualifying Features
		Ramsar criterion 6: species/populations occurring at levels of international importance. Qualifying Species/populations with peak counts in winter: • Dark-bellied brent goose- 2,103 individuals, representing an average of 2.1% of the Great Britain population (five-year peak mean 1998/1999 to 2002/2003)
Crouch and Roach Estuaries (Mid-Essex Coast Phase 3) SPA UK9009244	The Rivers Crouch and Roach are situated in South Essex. The River Crouch occupies a shallow valley between two ridges of London Clay, whilst the River Roach is set predominantly between areas of brick earth and loams with patches of sand and gravel. The intertidal zone along the Rivers Crouch and Roach is 'squeezed' between the sea walls of both banks and the river channel. This leaves a relatively narrow strip of tidal mud unlike other estuaries in the county, which, nonetheless, is used by significant numbers of birds. One species is present in internationally important numbers, and three other species of wader and wildfowl occur in nationally important numbers. Additional interest is provided by the aquatic and terrestrial invertebrates and by an outstanding assemblage of nationally scarce plants. It is 1,735.58 ha and located 51.3816 N, 0.4010 E.	Article 4.2 Qualification (2009/147/EC) Over winter the area regularly supports: • Dark-bellied brent goose (Western Siberia/ Western Europe) 1% of the population five-year peak mean 1989/1990 to 1993/1994. Article 4.2 Qualification (2009/147/EC): An Internationally Important Assemblage of Birds Over winter the area regularly supports: • 27,021 waterbirds (five-year peak mean 1990/1991 to 1994/1995) Including: Dark-bellied brent goose
Medway Estuary and Marshes Ramsar Site UK11040	A complex of rain-fed, brackish, floodplain grazing marsh with ditches, and intertidal saltmarsh and mudflat. These habitats together support internationally important numbers of wintering waterfowl. Rare wetland birds breed in important numbers. The saltmarsh and grazing marsh are of international importance for their diverse assemblages of wetland plants and invertebrates.	Ramsar criterion 2: The site supports a number of species of rare plants and animals. The site holds several nationally scarce plants, including • sea barley, curved hard-grass, annual beard-*grass (Polypogon monspeliensis)*, Borrer's saltmarsh-grass, slender hare`s-ear, sea clover, saltmarsh goosefoot (*Chenopodium chenopodioides)*, golden

Site Name	Site Description	Qualifying Features
	It largely follows the boundary of the existing SPA but is 4,697.93 ha (slightly larger than existing SPA), and located 51.2402 N, 0.4038 E.	samphire, perennial glasswort and one-flowered glasswort • A total of at least twelve British Red Data Book species of wetland invertebrates have been recorded on the site. These include a ground beetle (*Polistichus connexus)*, a fly (*Cephalops perspicuous)*, a dancefly (*Poecilobothrus ducalis)*, a fly (*Anagnota collini)*, a weevil (*Baris scolopacea)*, a water beetle (*Berosus spinosus)*, a beetle (*Malachius vulneratus)*, a rove beetle (*Philonthus punctus)*, the ground lackey moth (*Malacosoma castrensis)*, a horsefly (*Atylotus latistriatuus)*, a fly (*Campsicnemus magius)*, a solider beetle, (*Cantharis fusca)*, and a cranefly (*Limonia Danica)*. • A significant number of non-wetland British Red Data Book species also occur Ramsar criterion 5: Assemblages of international importance: Species with peak counts in winter: • 47,637 waterfowl (five-year peak mean 1998/1999 to 2002/2003) Ramsar criterion 6: species/populations occurring at levels of international importance. Qualifying Species/ populations with peak counts in spring/ autumn: • Grey plover (Eastern Atlantic/ Western Africa -wintering) - 3,103 individuals, representing an average of 1.2% of the population (five-year peak mean 1998/1999 to 2002/2003) • Common redshank - 3,709 individuals, representing an average of 1.4% of the population (five-year peak mean 1998/1999 to 2002/2003) Species with peak counts in winter:

Site Name	Site Description	Qualifying Features
		• Dark-bellied brent goose – 2,575 individuals, representing an average of 1.1% of the population (five-year peak mean 1998/1999 to 2002/2003) • Common shelduck (NW Europe) – 2,627 individuals, representing an average of 3.3 % of the Great Britain population (five-year peak mean 1998/1999 to 2002/2003) • Northern pintail (Northwestern Europe) – 1,118 individuals, representing an average of 1.8 % of the population (five-year peak mean 1998/1999 to 2002/2003) • Ringed plover (Europe/ Northwest Africa) - 540 individuals, representing an average of 1.6% of the Great Britain population (five-year peak mean 1998/1999 to 2002/2003) • Red knot (Western and Southern Africa - wintering) – 3,021 individuals, representing an average of 1% of the Great Britain population (five-year peak mean 1998/1999 to 2002/2003) • Dunlin (Western Siberia/ Western Europe) – 8,263 individuals, representing an average of 1.4% of the Great Britain population (five-year peak mean 1998/9 to 2002/3) Species/populations identified subsequent to designation for possible future consideration under criterion 6. Species with peak counts in spring/autumn: • Black-tailed godwit (Iceland/W Europe) - 721 individuals, representing an average of 2 % of the population (five-year peak mean 1998/9 to 2002/3)
Medway Estuary and	A complex of rain-fed, brackish, floodplain grazing marsh with ditches, and intertidal saltmarsh and	Article 4.1 Qualification (79/409/EEC) During the breeding season the area regularly supports:

Site Name	Site Description	Qualifying Features
Marshes SPA UK9012031	mudflat. These habitats together support internationally important numbers of wintering waterfowl. Rare wetland birds breed in important numbers. The saltmarsh and grazing marsh are of international importance for their diverse assemblages of wetland plants and invertebrates. It is 4,686.32 ha and located 51.2402 N, 0.4038 E.	• Avocet (Western Europe/ Western Mediterranean - breeding) 6.2% of the Great Britain breeding population five-year mean, 1988 to 1992 • Little tern (Eastern Atlantic - breeding) 1.2% of the Great Britain breeding population five-year mean, 1991 to 1995 • Common tern (Northern/ Eastern Europe - breeding) 0.6% of the Great Britain breeding population count as at 1994 Over winter the area regularly supports: • Tundra Swan (Western Siberia/ Northeastern and North-western Europe) 0.2% of the Great Britain population five-year peak mean 1991/1992 to 1995/1996 • Avocet (Western Europe/ Western Mediterranean - breeding) 24.7% of the Great Britain population five-year peak mean 1991/1992 to 1995/1996 Article 4.2 Qualification (79/409/EEC) Over winter the area regularly supports: • Northern pintail (Northwestern Europe) 1.2% of the population five-year peak mean 1991/1992-1995/1996 • Northern shoveler (Northwestern/ Central Europe) 0.8% of the population in Great Britain five-year peak mean 1991/1992 to 1995/1996 • Eurasian teal (Northwestern Europe) 1.3% of the population in Great Britain five-year peak mean 1991/1992-1995/1996 • Wigeon (Western Siberia/ Northwestern/ Northeastern Europe) 1.6% of the population in Great Britain five-year peak mean 1991/1992 to 1995/1996

Site Name	Site Description	Qualifying Features
		• Ruddy turnstone, (Western Palearctic - wintering) 0.9% of the population in Great Britain five-year peak mean 1991/1992 to 1995/1996 • Dark-bellied brent goose (Western Siberia/ Western Europe) 1.1% of the population five-year peak mean 1991/1992 to 1995/1996 • Dunlin (Northern Siberia/ Europe/ Western Africa) 1.9% of the population five-year peak mean 1991/1992 to 1995/1996 • Red knot (North-eastern Canada/ Greenland/ Iceland/ North-western Europe) 0.2% of the population five-year peak mean 1991/1992 to 1995/1996 • Common ringed plover (Europe/ Northern Africa - wintering) 1.6% of the population five-year peak mean 1991/1992 to 1995/1996 • Eurasian oystercatcher, (Europe and Northern/ Western Africa) 1% of the population in Great Britain five-year peak mean 1991/1992 to 1995/1996 • Black-tailed godwit (Iceland - breeding) 12.9% of the population in Great Britain five-year peak mean 1991/1992 to 1995/1996 • Curlew (Europe - breeding) 1.7% of the population in Great Britain five-year peak mean 1991/1992 to 1995/1996 • Grey plover (Eastern Atlantic - wintering) 2% of the population five-year peak mean 1991/1992 to 1995/1996 • Common shelduck (North-western Europe) 1.5% of the population five-year peak mean 1991/1992 to 1995/1996 • Common greenshank, (Europe/Western Africa) 2.6% of

Site Name	Site Description	Qualifying Features
		the population in Great Britain No count period specified. • Common red shank (Eastern Atlantic - wintering) 2.1% of the population five-year peak mean 1991/1992 to 1995/1996 Article 4.2 Qualification (79/409/EEC): An Internationally Important Assemblage of Birds Over winter the area regularly supports: • 65,496 waterfowl (five-year peak mean 1991/1992 to 1995/1996) Including: red-throated loon, great crested grebe, cormorant, Tundra swan, brent goose, common shelduck, Eurasian wigeon, Eurasian teal, mallard, northern pintail, northern shoveler, common pochard, Eurasian oystercatcher, avocet, common ringed plover, grey plover, lapwing, red knot, dunlin, black-tailed godwit, curlew, common redshank, common greenshank, turnstone
Hamford Water Ramsar Site UK11028	Hamford Water is a large, shallow estuarine basin comprising tidal creeks and islands, intertidal mud and sand flats, and saltmarsh supporting rare plants and internationally important species/populations of migratory waterfowl. It is 2,188.59 ha and located 51 52 46 N 01 14 29 E.	Ramsar criterion 6: species/populations occurring at levels of international importance. Qualifying Species/ populations with peak counts in spring/ autumn: • Ringed plover (Europe/ North-west Africa) – 1,169 individuals, representing an average of 1.6% of the population (five-year peak mean 1998/1999 to 2002/2003) • Common redshank – 2,099 individuals, representing an average of 1.8% of the Great Britain population (five-year peak mean 1998/1999 to 2002/2003) Species with peak counts in winter: • Dark-bellied brent goose - 3,629 individuals, representing an average of 1.6% of the population (five-year peak mean 1998/1999 to 2002/2003)

Site Name	Site Description	Qualifying Features
		• Black-tailed godwit (Iceland/ Western Europe) - 377 individuals, representing an average of 1% of the population (five-year peak mean 1998/1999 to 2002/2003) Species/ populations identified subsequent to designation for possible future consideration under criterion 6. Species with peak counts in winter: • Grey plover (Eastern Atlantic/ Western Africa -wintering) - 2,749 individuals, representing an average of 1.1% of the population (five-year peak mean 1998/1999 to 2002/2003)
Hamford Water SPA UK9009131	The Hamford Water SPA includes both marine areas (i.e. land covered continuously or intermittently by tidal waters) and land which is not subject to tidal influence. The inland section of the SPA follows the same boundary as the Ramsar Site and consists of a large, shallow estuarine basin comprising tidal creeks and islands, intertidal mud and sand flats, and saltmarsh supporting rare plants and internationally important species/populations of migratory waterfowl. The marine section of the SPA was established to protect the foraging habitat of little tern whilst they are breeding in Hamford water. It is 3,532.55 ha and located 51.8794 N, 1.2877 E.	Article 4.1 Qualification (79/409/EEC) During the breeding season the area regularly supports: • Little tern (Eastern Atlantic - breeding) 2.1% of the Great Britain breeding population (five-year mean 2010 to 2014) Over winter the area regularly supports: • Avocet (Western Europe/ Western Mediterranean - breeding) 25% of the Great Britain population five-year peak mean 1991/1992 to 1995/1996 Article 4.2 Qualification (79/409/EEC) Over winter the area regularly supports: • Eurasian teal (North-western Europe) 2.7% of the population in Great Britain five-year peak mean 1991/1992 to 1995/1996 • Dark-bellied brent goose (Western Siberia/ Western Europe) 2.3% of the population five-year peak mean 1991/1992 to 1995/1996 • Common ringed plover (Europe/ Northern Africa - wintering) 1.1%

Site Name	Site Description	Qualifying Features
		of the population five-year peak mean 1991/1992 to 1995/1996 • Black-tailed godwit (Iceland - breeding) 1.7% of the population five-year peak mean 1991/1992 to 1995/1996 • Grey plover (Eastern Atlantic - wintering) 7.5% of the population in Great Britain five-year peak mean 1991/1992 to 1995/1996 • Common shelduck (North-western Europe) 2.2% of the population in Great Britain five-year peak mean 1991/1992 to 1995/1996 • Common shelduck (Eastern Atlantic - wintering) 0.8% of the population five-year peak mean 1991/1992 to 1995/1996.
Deben Estuary Ramsar Site UK11017	This estuary is relatively narrow and sheltered. It has limited amounts of freshwater input, and the intertidal areas are constrained by sea-walls. The site supports nationally and internationally important flora and fauna. Its boundary follows the existing SPA, which is 978.93 ha and located 52.0231 N, 1.2044 E.	Ramsar criterion 2: Supports a population of Narrow-mouthed whorl snails (Habitats Directive Annex II (S1014); British Red Data Book Endangered). • Martlesham Creek is one of only about fourteen sites in Britain where this species survives. Ramsar criterion 6: species/ populations occurring at levels of international importance. Qualifying Species/populations with peak counts in winter: • Dark-bellied brent goose-1953 individuals, representing an average of 1.9% of the Great Britain population (five-year peak mean 1998/1999 to 2002/2003)
Deben Estuary SPA UK9009261	This estuary is relatively narrow and sheltered. It has limited amounts of freshwater input and the intertidal areas are constrained by sea-walls. The site supports nationally and internationally important flora and fauna. It is 978.93 ha and located 52.0231 N, 1.2044 E.	Article 4.1 Qualification (79/409/EEC) Over winter the area regularly supports: • Avocet (Western Europe/ Western Mediterranean - breeding) 7.5% of the Great Britain population five-year peak mean 1991/1992 to 1995/1996 Article 4.2 Qualification (79/409/EEC)

Site Name	Site Description	Qualifying Features
		Over winter the area regularly supports: • Dark-bellied brent goose (Western Siberia/ Western Europe) 0.8% of the population five-year peak mean 1991/1992 to 1995/1996
Dengie (Mid-Essex Coast Phase 1) Ramsar Site UK11018	Dengie is a large and remote area of tidal mudflat and saltmarsh at the eastern end of the Dengie peninsula, between the Blackwater and Crouch Estuaries. The saltmarsh is the largest continuous example of its type in Essex. Foreshore, saltmarsh and beaches support an outstanding assemblage of rare coastal flora. It hosts internationally and nationally important wintering populations of wildfowl and waders, and in summer supports a range of breeding coastal birds including rarities. The formation of cockleshell spits and beaches is of geomorphological interest. Its boundary follows the existing SPA, which is 3,127.23 ha and located 51.4126 N, 0.5734 E.	Ramsar criterion 1: Qualifies by virtue of the extent and diversity of saltmarsh habitat present. Dengie, and the four other sites in the Mid-Essex Coast Ramsar site complex, includes a total of 3,237 ha, that represent 70% of the saltmarsh habitat in Essex and 7% of the total area of saltmarsh in Britain. Ramsar criterion 2: Dengie supports a number of rare plant and animal species. The Dengie has 11 species of nationally scarce plants: • sea kale (*Crambe maritima)*, sea barley, golden samphire, lax flowered sea lavender, the glassworts and small cord-grass, shrubby sea-blite, and the eelgrasses. The invertebrate fauna includes the following Red Data Book species: • weevil • Southern saltmarsh horsefly (*Atylotus latistriatus)* • jumping spider (*Euophrys browningi*) Ramsar criterion 3: This site supports a full and representative sequences of saltmarsh plant communities covering the range of variation in Britain. Ramsar criterion 5: Assemblages of international importance: Species with peak counts in winter: • 43,828 waterfowl (five-year peak mean 1998/1999 to 2002/2003)

Site Name	Site Description	Qualifying Features
		Ramsar criterion 6: species/populations occurring at levels of international importance. Qualifying Species/ populations with peak counts in winter: • Dark-bellied brent goose- 2,000 individuals, representing an average of 2% of the Great Britain population (five-year peak mean 1998/1999 to 2002/2003) • Grey plover *(*Eastern Atlantic/ Western Africa -wintering)- 4,582 individuals, representing an average of 1.8% of the population (five-year peak mean 1998/1999 to 2002/2003) • Red knot (Western and Southern Africa- wintering)- 14,528 individuals, representing an average of 3.2% of the population (five-year peak mean 1998/1999 to 2002/2003) Species/ populations identified subsequent to designation for possible future consideration under criterion 6. Species with peak counts in winter: • Bar-tailed godwit, (Western Palearctic) - 2,593 individuals, representing an average of 2.1% of the population (five-year peak mean 1998/1999 to 2002/2003)
Dengie (Mid-Essex Coast Phase 1) SPA UK9009242	Dengie is a large and remote area of tidal mudflat and saltmarsh at the eastern end of the Dengie peninsula, between the Blackwater and Crouch Estuaries. The saltmarsh is the largest continuous example of its type in Essex. Foreshore, saltmarsh and beaches support an outstanding assemblage of rare coastal flora. It hosts internationally and nationally important wintering populations of wildfowl and waders, and in summer supports a range of breeding coastal birds including rarities. The formation of cockleshell spits and beaches is of geomorphological interest.	Article 4.1 Qualification (79/409/EEC) Over winter the area regularly supports: • Hen harrier up to 2.5% of the Great Britain population five-year mean, 1987 to 1991 Article 4.2 Qualification (79/409/EEC) Over winter the area regularly supports: • Dark-bellied brent goose (Western Siberia/ Western Europe) 0.8% of the population five-year peak mean 1991/1992 to 1995/1996

Site Name	Site Description	Qualifying Features
	It is 3,127.23 ha and located 51.4126 N, 0.5734 E.	• Red knot (North-eastern Canada/ Greenland/ Iceland/ North-western Europe) 2.4% of the population five-year peak mean 1991/1992 to 1995/1996 • Grey plover (Eastern Atlantic - wintering) 1.4% of the population five-year peak mean 1991/1992 to 1995/1996 Article 4.2 Qualification (79/409/EEC): An Internationally Important Assemblage of Birds Over winter the area regularly supports: • 31,454 waterfowl (five-year peak mean 1991/1992 to 1995/1996) Including: Dark-bellied brent goose, Red Knot.
Outer Thames Estuary SPA UK9020309	The Outer Thames Estuary SPA lies along the east coast of England, predominantly in the coastal waters of the southern North Sea between the Thames Estuary and the east Norfolk coast. It covers an area of approximately 3,924 km^2, classified for the protection of wintering red-throated diver, breeding little terns and breeding common terns. This area supports the largest aggregations of wintering red-throated diver in the UK, 38% of the Great Britain population. The foraging areas protected for little tern and common tern, enhance the protection afforded to their feeding and nesting areas in the adjacent coastal SPAs. The area of the SPA contains areas of shallow and deeper water, with high tidal current streams and a range of mobile sediments, including several shallow sandbanks. Much of the area is less than 20 m water depth, extending into the 20–50 m depth contour towards the eastern boundary of the SPA. It is 392,451.66 ha and located 51.916 N, 1.545 E.	Article 4.1 Qualification (79/409/EEC) Over winter the area regularly supports: • Red-throated loon (North-western Europe - wintering)- 38% of the population in Great Britain peak mean over the period 1989 to 2006/2007. The area supports breeding populations of: • Little tern (in breeding season) - 19.64% of Great Britain population (2011 to 2015) • Common tern (in breeding season) - 2.66% of Great Britain population (2011 to 2015)

Site Name	Site Description	Qualifying Features
Sandlings SPA UK9020286	The Sandlings SPA lies near the Suffolk Coast between the Deben Estuary and Leiston. In the 19th century, the area was dominated by heathland developed on glacial sandy soils. During the 20th century, large areas of heath were planted with blocks of commercial conifer forest and others were converted to arable agriculture. Lack of traditional management has resulted in the remnant areas of heath being subject to successional changes, with the consequent spread of bracken, shrubs and trees, although recent conservation management work is resulting in their restoration. The heaths support both acid grassland and heather-dominated plant communities, with dependent invertebrate and bird communities of conservation value. Woodlark and Nightjar (*Caprimulgus europaeus*) have also adapted to breeding in the large conifer forest blocks, using areas that have recently been felled and recent plantation, as well as areas managed as open ground. It is 3,391.80 ha and located 52.07888889 N, 1.4425 E.	Article 4.1 Qualification (79/409/EEC) During the breeding season the area regularly supports: • European nightjar, 3.2% of the Great Britain breeding population count in 1992 • Woodlark, 10.3% of the Great Britain breeding population count in 1997

Appendix E. Citations and Conservation Objectives

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Appendix E
Citations and Conservation Objectives

Norfolk Valley Fens SAC – Citation

EC Directive 92/43 on the Conservation of Natural Habitats and of Wild Fauna and Flora

Citation for Special Area of Conservation (SAC)

Name:	Norfolk Valley Fens
Unitary Authority/County:	Norfolk
SAC status:	Designated on 1 April 2005
Grid reference:	TL937960
SAC EU code:	UK0012892
Area (ha):	616.21
Component SSSI:	Badley Moor, Dereham SSSI, Booton Common SSSI, Buxton Heath SSSI, Coston Fen, Runhall SSSI, East Walton Common and Adcock's Common SSSI, Flordon Common SSSI, Foulden Common SSSI, Great Cressingham Fen SSSI, Holt Lowes SSSI, Potter and Scarning Fens SSSI, Sheringham and Beeston Regis Common SSSI, South Repps Common SSSI, Swangey Fen, Attleborough SSSI, Thompson Water, Carr and Common SSSI

Site description:

This site comprises a series of valley-head spring-fed fens. Such spring-fed flush fens are very rare in the lowlands. The spring-heads are dominated by the small sedge fen type, mainly referable to black-bog-rush – blunt-flowered rush (*Schoenus nigricans – Juncus subnodulosus*) mire, but there are transitions to reedswamp and other fen and wet grassland types. The individual fens vary in their structure according to intensity of management and provide a wide range of variation. There is a rich flora associated with these fens, including species such as grass-of-Parnassus *Parnassia palustris*, common butterwort *Pinguicula vulgaris*, marsh helleborine *Epipactis palustris* and narrow-leaved marsh-orchid *Dactylorhiza traunsteineri*.

In places the calcareous fens grade into acidic flush communities on the valley sides. Purple moor-grass *Molinia caerulea* is often dominant with a variety of mosses including thick carpets of bog-moss *Sphagnum* spp. Marshy grassland may be present on drier ground and purple moor-grass is again usually dominant but cross-leaved heath *Erica tetralix* can be frequent. Alder *Alnus glutinosa* forms carr woodland in places by streams. Wet and dry heaths and acid, neutral and calcareous grassland surround the mires.

Within the Norfolk Valley Fens there are a number of marginal fens associated with pingos – pools that formed in hollows left when large blocks of ice melted at the end of the last Ice Age. These are very ancient wetlands and several support strong populations of Desmoulin's whorl snail *Vertigo moulinsiana* as part of a rich assemblage of rare and scarce species in standing water habitat. At Flordon Common a strong population of narrow-mouthed whorl snail *Vertigo angustior* occurs in flushed grassland with yellow iris *Iris pseudacorus*.

Qualifying habitats: The site is designated under **article 4(4)** of the Directive (92/43/EEC) as it hosts the following habitats listed in Annex I:

- Alkaline fens. (Calcium-rich springwater-fed fens)
- Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion*, *Alnion incanae*, *Salicion albae*). (Alder woodland on floodplains)*
- Calcareous fens with *Cladium mariscus* and species of the *Caricion davallianae*. (Calcium-rich fen dominated by great fen sedge (saw sedge))*
- European dry heaths
- *Molinia* meadows on calcareous, peaty or clayey-silt-laden soils (*Molinion caeruleae*). (Purple moor-grass meadows)
- Northern Atlantic wet heaths with *Erica tetralix*. (Wet heathland with cross-leaved heath)
- Semi-natural dry grasslands and scrubland facies: on calcareous substrates (*Festuco-Brometalia*). (Dry grasslands and scrublands on chalk or limestone)

Qualifying species: The site is designated under **article 4(4)** of the Directive (92/43/EEC) as it hosts the following species listed in Annex II:

- Narrow-mouthed whorl snail *Vertigo angustior*
- Desmoulin's whorl snail *Vertigo moulinsiana*

Annex I priority habitats are denoted by an asterisk (*).

This citation relates to a site entered in the Register of European Sites for Great Britain.
Register reference number: UK0012892
Date of registration: 14 June 2005
Signed: [redacted]
On behalf of the Secretary of State for Environment, Food and Rural Affairs

STANDARD DATA FORM for sites within the 'UK national site network of European sites'

Special Protection Areas (SPAs) are classified and Special Areas of Conservation (SACs) are designated under:

- the Conservation of Habitats and Species Regulations 2017 (as amended) in England and Wales (including the adjacent territorial sea) and to a limited extent in Scotland (reserved matters) and Northern Ireland (excepted matters);
- the Conservation (Natural Habitats &c.) Regulations 1994 (as amended) in Scotland;
- the Conservation (Natural Habitats, &c) Regulations (Northern Ireland) 1995 (as amended) in Northern Ireland; and
- the Conservation of Offshore Marine Habitats and Species Regulations 2017 (as amended) in the UK offshore area.

Each SAC or SPA (forming part of the UK national site network of European sites) has its own Standard Data Form containing site-specific information. The information provided here generally follows the same documenting format for SACs and SPAs, as set out in the Official Journal of the European Union recording the Commission Implementing Decision of 11 July 2011 (2011/484/EU).

Please note that these forms contain a number of codes, all of which are explained either within the data forms themselves or in the end notes.

More general information on SPAs and SACs in the UK is available from the SPA homepage and SAC homepage on the JNCC website. These webpages also provide links to Standard Data Forms for all SAC and SPA sites in the UK.

https://jncc.gov.uk/

NATURA 2000 - STANDARD DATA FORM

**For Special Protection Areas (SPA),
Proposed Sites for Community Importance (pSCI),
Sites of Community Importance (SCI) and
for Special Areas of Conservation (SAC)**

SITE **UK0012892**

SITENAME **Norfolk Valley Fens**

TABLE OF CONTENTS

1. SITE IDENTIFICATION

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1.1 Type	1.2 Site code
B	UK0012892

1.3 Site name

Norfolk Valley Fens

1.4 First Compilation date	1.5 Update date
1995-06	2015-12

1.6 Respondent:

Name/Organisation:	Joint Nature Conservation Committee
Address:	Joint Nature Conservation Committee Monkstone House City Road Peterborough PE1 1JY
Email:	

Date site proposed as SCI:	1995-06
Date site confirmed as SCI:	2004-12
Date site designated as SAC:	2005-04
National legal reference of SAC designation:	Regulations 11 and 13-15 of the Conservation of Habitats and Species Regulations 2010 (http://www.legislation.gov.uk/uksi/2010/490/contents/made).

2. SITE LOCATION

2.1 Site-centre location [decimal degrees]:

Longitude	Latitude
0.856111111	52.52666667

2.2 Area [ha]:

616.48

2.3 Marine area [%]

0.0

2.4 Sitelength [km]:

0.0

2.5 Administrative region code and name

NUTS level 2 code	Region Name
UKH1	East Anglia

2.6 Biogeographical Region(s)

Atlantic (100.0 %)

3. ECOLOGICAL INFORMATION

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3.1 Habitat types present on the site and assessment for them

Annex I Habitat types						Site assessment			
Code	PF	NP	Cover [ha]	Cave [number]	Data quality	A|B|C|D	A|B|C		
						Representativity	Relative Surface	Conservation	Global
4010			6.78	0	G	C	C	B	C
4030			75.83	0	G	A	C	B	C
6210			10.48	0	G	C	C	B	C
6410			12.95	0	G	B	C	B	C
7150			1.23	0	G	D			
7210	X		14.18	0	G	C	B	B	C
7230			61.65	0	M	A	C	A	A
91E0	X		6.78	0	G	C	C	B	C

- **PF:** for the habitat types that can have a non-priority as well as a priority form (6210, 7130, 9430) enter "X" in the column PF to indicate the priority form.
- **NP:** in case that a habitat type no longer exists in the site enter: x (optional)
- **Cover:** decimal values can be entered
- **Caves:** for habitat types 8310, 8330 (caves) enter the number of caves if estimated surface is not available.
- **Data quality:** G = 'Good' (e.g. based on surveys); M = 'Moderate' (e.g. based on partial data with some extrapolation); P = 'Poor' (e.g. rough estimation)

3.2 Species referred to in Article 4 of Directive 2009/147/EC and listed in Annex II of Directive 92/43/EEC and site evaluation for them

Species					Population in the site						Site assessment			
G	Code	Scientific Name	S	NP	T	Size		Unit	Cat.	D.qual.	A|B|C|D	A|B|C		
						Min	Max				Pop.	Con.	Iso.	Glo.
M	1355	Lutra lutra			p				P	DD	D			
A	1166	Triturus cristatus			p				P	DD	D			
I	1014	Vertigo angustior			p				R	DD	B	B	A	B
I	1016	Vertigo moulinsiana			p				P	DD	C	B	C	B

- **Group:** A = Amphibians, B = Birds, F = Fish, I = Invertebrates, M = Mammals, P = Plants, R = Reptiles
- **S:** in case that the data on species are sensitive and therefore have to be blocked for any public access enter: yes
- **NP:** in case that a species is no longer present in the site enter: x (optional)
- **Type:** p = permanent, r = reproducing, c = concentration, w = wintering (for plant and non-migratory species use permanent)
- **Unit:** i = individuals, p = pairs or other units according to the Standard list of population units and codes in accordance with Article 12 and 17 reporting (see reference portal)
- **Abundance categories (Cat.):** C = common, R = rare, V = very rare, P = present - to fill if data are deficient (DD) or in addition to population size information
- **Data quality:** G = 'Good' (e.g. based on surveys); M = 'Moderate' (e.g. based on partial data with some extrapolation); P = 'Poor' (e.g. rough estimation); VP = 'Very poor' (use this category only, if not even a rough estimation of the population size can be made, in this case the fields for population size can remain empty, but the field "Abundance categories" has to be filled in)

4. SITE DESCRIPTION

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4.1 General site character

Habitat class	% Cover
N09	5.0
N16	30.0
N06	5.0
N08	30.0
N10	5.0
N07	25.0
Total Habitat Cover	100

Other Site Characteristics

1 Terrestrial: Soil & Geology: nutrient-poor,acidic,peat,basic 2 Terrestrial: Geomorphology and landscape: lowland,valley

4.2 Quality and importance

Northern Atlantic wet heaths with Erica tetralix for which the area is considered to support a significant presence. European dry heaths for which the area is considered to support a significant presence. Semi-natural dry grasslands and scrubland facies: on calcareous substrates (Festuco-Brometalia) for which the area is considered to support a significant presence. Molinia meadows on calcareous, peaty or clayey-silt-laden soils (Molinion caeruleae) for which the area is considered to support a significant presence. Calcareous fens with Cladium mariscus and species of the Caricion davallianae for which the area is considered to support a significant presence. which is considered to be rare as its total extent in the United Kingdom is estimated to be less than 1000 hectares. Alkaline fens for which this is considered to be one of the best areas in the United Kingdom. Alluvial forests with Alnus glutinosa and Fraxinus excelsior (Alno-Padion, Alnion incanae, Salicion albae) for which the area is considered to support a significant presence. Vertigo moulinsiana for which this is considered to be one of the best areas in the United Kingdom. Vertigo angustior for which this is considered to be one of the best areas in the United Kingdom.

4.3 Threats, pressures and activities with impacts on the site

The most important impacts and activities with high effect on the site

Negative Impacts			
Rank	Threats and pressures [code]	Pollution (optional) [code]	inside/outside [i|o|b]
H	A03		I
H	H02		B
H	J02		B
H	K02		I

Positive Impacts			
Rank	Activities, management [code]	Pollution (optional) [code]	inside/outside [i|o|b]
H	A04		I
H	A02		I
H	B02		I

Rank: H = high, M = medium, L = low
Pollution: N = Nitrogen input, P = Phosphor/Phosphate input, A = Acid input/acidification,
T = toxic inorganic chemicals, O = toxic organic chemicals, X = Mixed pollutions
i = inside, o = outside, b = both

4.5 Documentation

Conservation Objectives - the Natural England links below provide access to the Conservation Objectives (and other site-related information) for its terrestrial and inshore Natura 2000 sites, including conservation advice packages and supporting documents for European Marine Sites within English waters and for cross-border sites. See also the 'UK Approach' document for more information (link via the JNCC website).

Link(s): http://publications.naturalengland.org.uk/category/6490068894089216

http://publications.naturalengland.org.uk/category/3212324
http://jncc.defra.gov.uk/pdf/Natura2000_StandardDataForm_UKApproach_Dec2015.pdf

5. SITE PROTECTION STATUS (optional)

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5.1 Designation types at national and regional level:

Code	Cover [%]	Code	Cover [%]	Code	Cover [%]
UK04	100.0				

6. SITE MANAGEMENT

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6.1 Body(ies) responsible for the site management:

Organisation:	Natural England
Address:	
Email:	

6.2 Management Plan(s):

An actual management plan does exist:

- [ ] Yes
- [ ] No, but in preparation
- [X] No

6.3 Conservation measures (optional)

For available information, including on Conservation Objectives, see Section 4.5.

EXPLANATION OF CODES USED IN THE SPECIAL AREA OF CONSERVATION (SAC) AND SPECIAL PROTECTION AREA (SPA) STANDARD DATA FORMS

The codes in the table below generally follow those explained in the official European Union guidelines for the Standard Data Form (also referencing the relevant page number).

1.1 Site type

CODE	DESCRIPTION	PAGE NO
A	SPA (classified Special Protection Area)	53
B	cSAC, SCI or SAC (candidate Special Area of Conservation, Site of Community Importance, designated Special Area of Conservation)	53
C	SPA area/boundary is the same as the cSAC/SCI/SAC i.e. a co-classified/designated site (Note: this situation only occurs in Gibraltar)	53

3.1 Habitat code

CODE	DESCRIPTION	PAGE NO
1110	Sandbanks which are slightly covered by sea water all the time	57
1130	Estuaries	57
1140	Mudflats and sandflats not covered by seawater at low tide	57
1150	Coastal lagoons	57
1160	Large shallow inlets and bays	57
1170	Reefs	57
1180	Submarine structures made by leaking gases	57
1210	Annual vegetation of drift lines	57
1220	Perennial vegetation of stony banks	57
1230	Vegetated sea cliffs of the Atlantic and Baltic Coasts	57
1310	Salicornia and other annuals colonizing mud and sand	57
1320	Spartina swards (Spartinion maritimae)	57
1330	Atlantic salt meadows (Glauco-Puccinellietalia maritimae)	57
1340	Inland salt meadows	57
1420	Mediterranean and thermo-Atlantic halophilous scrubs (Sarcocornetea fruticosi)	57
2110	Embryonic shifting dunes	57
2120	Shifting dunes along the shoreline with Ammophila arenaria ("white dunes")	57
2130	Fixed coastal dunes with herbaceous vegetation ("grey dunes")	57
2140	Decalcified fixed dunes with Empetrum nigrum	57
2150	Atlantic decalcified fixed dunes (Calluno-Ulicetea)	57
2160	Dunes with Hippopha• rhamnoides	57
2170	Dunes with Salix repens ssp. argentea (Salicion arenariae)	57
2190	Humid dune slacks	57
21A0	Machairs (* in Ireland)	57
2250	Coastal dunes with Juniperus spp.	57
2330	Inland dunes with open Corynephorus and Agrostis grasslands	57
3110	Oligotrophic waters containing very few minerals of sandy plains (Littorelletalia uniflorae)	57
3130	Oligotrophic to mesotrophic standing waters with vegetation of the Littorelletea uniflorae and/or of the Isoëto-Nanojuncetea	57
3140	Hard oligo-mesotrophic waters with benthic vegetation of Chara spp.	57
3150	Natural eutrophic lakes with Magnopotamion or Hydrocharition - type vegetation	57

CODE	DESCRIPTION	PAGE NO
3160	Natural dystrophic lakes and ponds	57
3170	Mediterranean temporary ponds	57
3180	Turloughs	57
3260	Water courses of plain to montane levels with the Ranunculion fluitantis and Callitricho-Batrachion vegetation	57
4010	Northern Atlantic wet heaths with Erica tetralix	57
4020	Temperate Atlantic wet heaths with Erica ciliaris and Erica tetralix	57
4030	European dry heaths	57
4040	Dry Atlantic coastal heaths with Erica vagans	57
4060	Alpine and Boreal heaths	57
4080	Sub-Arctic Salix spp. scrub	57
5110	Stable xerothermophilous formations with Buxus sempervirens on rock slopes (Berberidion p.p.)	57
5130	Juniperus communis formations on heaths or calcareous grasslands	57
6130	Calaminarian grasslands of the Violetalia calaminariae	57
6150	Siliceous alpine and boreal grasslands	57
6170	Alpine and subalpine calcareous grasslands	57
6210	Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia) (* important orchid sites)	57
6230	Species-rich Nardus grasslands, on silicious substrates in mountain areas (and submountain areas in Continental Europe)	57
6410	Molinia meadows on calcareous, peaty or clayey-silt-laden soils (Molinion caeruleae)	57
6430	Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels	57
6510	Lowland hay meadows (Alopecurus pratensis, Sanguisorba officinalis)	57
6520	Mountain hay meadows	57
7110	Active raised bogs	57
7120	Degraded raised bogs still capable of natural regeneration	57
7130	Blanket bogs (* if active bog)	57
7140	Transition mires and quaking bogs	57
7150	Depressions on peat substrates of the Rhynchosporion	57
7210	Calcareous fens with Cladium mariscus and species of the Caricion davallianae	57
7220	Petrifying springs with tufa formation (Cratoneurion)	57
7230	Alkaline fens	57
7240	Alpine pioneer formations of the Caricion bicoloris-atrofuscae	57
8110	Siliceous scree of the montane to snow levels (Androsacetalia alpinae and Galeopsietalia ladani)	57
8120	Calcareous and calcshist screes of the montane to alpine levels (Thlaspietea rotundifolii)	57
8210	Calcareous rocky slopes with chasmophytic vegetation	57
8220	Siliceous rocky slopes with chasmophytic vegetation	57
8240	Limestone pavements	57
8310	Caves not open to the public	57
8330	Submerged or partially submerged sea caves	57
9120	Atlantic acidophilous beech forests with Ilex and sometimes also Taxus in the shrublayer (Quercion robori-petraeae or Ilici-Fagenion)	57
9130	Asperulo-Fagetum beech forests	57
9160	Sub-Atlantic and medio-European oak or oak-hornbeam forests of the Carpinion betuli	57
9180	Tilio-Acerion forests of slopes, screes and ravines	57
9190	Old acidophilous oak woods with Quercus robur on sandy plains	57
91A0	Old sessile oak woods with Ilex and Blechnum in the British Isles	57
91C0	Caledonian forest	57
91D0	Bog woodland	57
91E0	Alluvial forests with Alnus glutinosa and Fraxinus excelsior (Alno-Padion, Alnion incanae, Salicion albae)	57
91J0	Taxus baccata woods of the British Isles	57

3.1 Habitat representativity (abbreviated to 'Representativity' in data form)

CODE	DESCRIPTION	PAGE NO
A	Excellent representatively	57
B	Good representatively	57
C	Significant representatively	57
D	Non-significant presence representatively	57

3.1 Relative surface

CODE	DESCRIPTION	PAGE NO
A	> 15%-100%	58
B	> 2%-15%	58
C	≤ 2%	58

3.1 Degree of conservation (abbreviated to 'Conservation' in data form)

CODE	DESCRIPTION	PAGE NO
A	Excellent conservation	59
B	Good conservation	59
C	Average or reduced conservation	59

3.1 Global assessment (abbreviated to 'Global' in data form)

CODE	DESCRIPTION	PAGE NO
A	Excellent value	59
B	Good value	59
C	Significant value	59

3.2 Population (abbreviated to 'Pop.' in data form)

CODE	DESCRIPTION	PAGE NO
A	> 15%-100%	62
B	> 2%-15%	62
C	≤ 2%	62
D	Non-significant population	62

3.2 Degree of conservation (abbreviated to 'Con.' in data form)

CODE	DESCRIPTION	PAGE NO
A	Excellent conservation	63
B	Good conservation	63
C	Average or reduced conservation	63

3.2 Isolation (abbreviated to 'Iso.' in data form)

CODE	DESCRIPTION	PAGE NO
A	Population (almost) Isolated	63
B	Population not-isolated, but on margins of area of distribution	63
C	Population not-isolated within extended distribution range	63

3.2 Global Grade (abbreviated to 'Glo.' or 'G.' in data form)

CODE	DESCRIPTION	PAGE NO
A	Excellent value	63
B	Good value	63
C	Significant value	63

3.3 Other species – essentially covers bird assemblage types

CODE	DESCRIPTION	PAGE NO
WATR	Non-breeding waterbird assemblage	UK specific code
SBA	Breeding seabird assemblage	UK specific code

BBA	Breeding bird assemblage (applies only to sites classified pre 2000)	UK specific code

4.1 Habitat class code

CODE	DESCRIPTION	PAGE NO
N01	Marine areas, Sea inlets	65
N02	Tidal rivers, Estuaries, Mud flats, Sand flats, Lagoons (including saltwork basins)	65
N03	Salt marshes, Salt pastures, Salt steppes	65
N04	Coastal sand dunes, Sand beaches, Machair	65
N05	Shingle, Sea cliffs, Islets	65
N06	Inland water bodies (Standing water, Running water)	65
N07	Bogs, Marshes, Water fringed vegetation, Fens	65
N08	Heath, Scrub, Maquis and Garrigue, Phygrana	65
N09	Dry grassland, Steppes	65
N10	Humid grassland, Mesophile grassland	65
N11	Alpine and sub-Alpine grassland	65
N14	Improved grassland	65
N15	Other arable land	65
N16	Broad-leaved deciduous woodland	65
N17	Coniferous woodland	65
N19	Mixed woodland	65
N21	Non-forest areas cultivated with woody plants (including Orchards, groves, Vineyards, Dehesas)	65
N22	Inland rocks, Screes, Sands, Permanent Snow and ice	65
N23	Other land (including Towns, Villages, Roads, Waste places, Mines, Industrial sites)	65
N25	Grassland and scrub habitats (general)	65
N26	Woodland habitats (general)	65

4.3 Threats code

CODE	DESCRIPTION	PAGE NO
A01	Cultivation	65
A02	Modification of cultivation practices	65
A03	Mowing / cutting of grassland	65
A04	Grazing	65
A05	Livestock farming and animal breeding (without grazing)	65
A06	Annual and perennial non-timber crops	65
A07	Use of biocides, hormones and chemicals	65
A08	Fertilisation	65
A10	Restructuring agricultural land holding	65
A11	Agriculture activities not referred to above	65
B01	Forest planting on open ground	65
B02	Forest and Plantation management & use	65
B03	Forest exploitation without replanting or natural regrowth	65
B04	Use of biocides, hormones and chemicals (forestry)	65
B06	Grazing in forests/ woodland	65
B07	Forestry activities not referred to above	65
C01	Mining and quarrying	65
C02	Exploration and extraction of oil or gas	65
C03	Renewable abiotic energy use	65
D01	Roads, paths and railroads	65
D02	Utility and service lines	65
D03	Shipping lanes, ports, marine constructions	65
D04	Airports, flightpaths	65
D05	Improved access to site	65
E01	Urbanised areas, human habitation	65
E02	Industrial or commercial areas	65

CODE	DESCRIPTION	PAGE NO
E03	Discharges	65
E04	Structures, buildings in the landscape	65
E06	Other urbanisation, industrial and similar activities	65
F01	Marine and Freshwater Aquaculture	65
F02	Fishing and harvesting aquatic ressources	65
F03	Hunting and collection of wild animals (terrestrial), including damage caused by game (excessive density), and taking/removal of terrestrial animals (including collection of insects, reptiles, amphibians, birds of prey, etc., trapping, poisoning, poaching, predator control, accidental capture (e.g. due to fishing gear), etc.)	65
F04	Taking / Removal of terrestrial plants, general	65
F05	Illegal taking/ removal of marine fauna	65
F06	Hunting, fishing or collecting activities not referred to above	65
G01	Outdoor sports and leisure activities, recreational activities	65
G02	Sport and leisure structures	65
G03	Interpretative centres	65
G04	Military use and civil unrest	65
G05	Other human intrusions and disturbances	65
H01	Pollution to surface waters (limnic & terrestrial, marine & brackish)	65
H02	Pollution to groundwater (point sources and diffuse sources)	65
H03	Marine water pollution	65
H04	Air pollution, air-borne pollutants	65
H05	Soil pollution and solid waste (excluding discharges)	65
H06	Excess energy	65
H07	Other forms of pollution	65
I01	Invasive non-native species	65
I02	Problematic native species	65
I03	Introduced genetic material, GMO	65
J01	Fire and fire suppression	65
J02	Human induced changes in hydraulic conditions	65
J03	Other ecosystem modifications	65
K01	Abiotic (slow) natural processes	65
K02	Biocenotic evolution, succession	65
K03	Interspecific faunal relations	65
K04	Interspecific floral relations	65
K05	Reduced fecundity/ genetic depression	65
L05	Collapse of terrain, landslide	65
L07	Storm, cyclone	65
L08	Inundation (natural processes)	65
L10	Other natural catastrophes	65
M01	Changes in abiotic conditions	65
M02	Changes in biotic conditions	65
U	Unknown threat or pressure	65
XO	Threats and pressures from outside the Member State	65

5.1 Designation type codes

CODE	DESCRIPTION	PAGE NO
UK00	No Protection Status	67
UK01	National Nature Reserve	67
UK04	Site of Special Scientific Interest (GB)	67
UK05	Marine Conservation Zone	67
UK06	Nature Conservation Marine Protected Area	67
UK86	Special Area (Channel Islands)	67
UK98	Area of Special Scientific Interest (NI)	67
IN00	Ramsar Convention site	67
IN08	Special Protection Area	67
IN09	Special Area of Conservation	67

European Site Conservation Objectives for Norfolk Valley Fens Special Area of Conservation Site Code: UK0012892

With regard to the SAC and the natural habitats and/or species for which the site has been designated (the 'Qualifying Features' listed below), and subject to natural change;

Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the Favourable Conservation Status of its Qualifying Features, by maintaining or restoring;

- **The extent and distribution of qualifying natural habitats and habitats of qualifying species**
- **The structure and function (including typical species) of qualifying natural habitats**
- **The structure and function of the habitats of qualifying species**
- **The supporting processes on which qualifying natural habitats and the habitats of qualifying species rely**
- **The populations of qualifying species, and,**
- **The distribution of qualifying species within the site.**

This document should be read in conjunction with the accompanying *Supplementary Advice* document, which provides more detailed advice and information to enable the application and achievement of the Objectives set out above.

Qualifying Features:

H4010. Northern Atlantic wet heaths with *Erica tetralix*; Wet heathland with cross-leaved heath

H4030. European dry heaths

H6210. Semi-natural dry grasslands and scrubland facies: on calcareous substrates (*Festuco-Brometalia*); Dry grasslands and scrublands on chalk or limestone

H6410. *Molinia* meadows on calcareous, peaty or clayey-silt-laden soils (*Molinion caeruleae*); Purple moor-grass meadows

H7210. Calcareous fens with *Cladium mariscus* and species of the *Caricion davallianae*; Calcium-rich fen dominated by great fen sedge (saw sedge)*

H7230. Alkaline fens; Calcium-rich springwater-fed fens

H91E0. Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion, Alnion incanae, Salicion albae*); Alder woodland on floodplains*

S1014. *Vertigo angustior*; Narrow-mouthed whorl snail

S1016. *Vertigo moulinsiana*; Desmoulin`s whorl snail

* denotes a priority natural habitat or species (supporting explanatory text on following page)

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*** Priority natural habitats or species**

Some of the natural habitats and species for which UK SACs have been selected are considered to be particular priorities for conservation at a European scale and are subject to special provisions in the Habitats Regulations. These priority natural habitats and species are denoted by an asterisk (*) in Annex I and II of the Habitats Directive. The term 'priority' is also used in other contexts, for example with reference to particular habitats or species that are prioritised in UK Biodiversity Action Plans. It is important to note however that these are not necessarily the priority natural habitats or species within the meaning of the Habitats Regulations.

Explanatory Notes: European Site Conservation Objectives

These Conservation Objectives are those referred to in the Conservation of Habitats and Species Regulations 2017 as amended from time to time (the "Habitats Regulations"). They must be considered when a competent authority is required to make a 'Habitats Regulations Assessment', including an Appropriate Assessment, under the relevant parts of this legislation.

These Conservation Objectives and the accompanying Supplementary Advice (where available) will also provide a framework to inform the measures needed to conserve or restore the European Site and the prevention of deterioration or significant disturbance of its qualifying features.

These Conservation Objectives are set for each habitat or species of a Special Area of Conservation (SAC). Where the objectives are met, the site will be considered to exhibit a high degree of integrity and to be contributing to achieving Favourable Conservation Status for that species or habitat type at a UK level. The term 'favourable conservation status' is defined in regulation 3 of the Habitats Regulations.

Publication date: 27 November 2018 (version 3). This document updates and replaces an earlier version dated 30 June 2014 to reflect the consolidation of the Habitats Regulations in 2017.

Information Sheet on Ramsar Wetlands (RIS)

Categories approved by Recommendation 4.7 (1990), as amended by Resolution VIII.13 of the 8th Conference of the Contracting Parties (2002) and Resolutions IX.1 Annex B, IX.6, IX.21 and IX. 22 of the 9th Conference of the Contracting Parties (2005).

Notes for compilers:

1. The RIS should be completed in accordance with the attached *Explanatory Notes and Guidelines for completing the Information Sheet on Ramsar Wetlands*. Compilers are strongly advised to read this guidance before filling in the RIS.

2. Further information and guidance in support of Ramsar site designations are provided in the *Strategic Framework for the future development of the List of Wetlands of International Importance* (Ramsar Wise Use Handbook 7, 2nd edition, as amended by COP9 Resolution IX.1 Annex B). A 3rd edition of the Handbook, incorporating these amendments, is in preparation and will be available in 2006.

3. Once completed, the RIS (and accompanying map(s)) should be submitted to the Ramsar Secretariat. Compilers should provide an electronic (MS Word) copy of the RIS and, where possible, digital copies of all maps.

1. Name and address of the compiler of this form:

FOR OFFICE USE ONLY.

DD MM YY

Designation date | Site Reference Number

Joint Nature Conservation Committee
Monkstone House
City Road
Peterborough
Cambridgeshire PE1 1JY
UK
Telephone/Fax: +44 (0)1733 – 562 626 / +44 (0)1733 – 555 948
Email: RIS@JNCC.gov.uk

2. Date this sheet was completed/updated:
Designated: 13 July 1994

3. Country:
UK (England)

4. Name of the Ramsar site:
Stour and Orwell Estuaries

5. Designation of new Ramsar site or update of existing site:

This RIS is for: Updated information on an existing Ramsar site

6. For RIS updates only, changes to the site since its designation or earlier update:

a) Site boundary and area:

** Important note: If the boundary and/or area of the designated site is being restricted/reduced, the Contracting Party should have followed the procedures established by the Conference of the Parties in the Annex to COP9 Resolution IX.6 and provided a report in line with paragraph 28 of that Annex, prior to the submission of an updated RIS.

b) Describe briefly any major changes to the ecological character of the Ramsar site, including in the application of the Criteria, since the previous RIS for the site:

7. Map of site included:

Refer to Annex III of the *Explanatory Notes and Guidelines*, for detailed guidance on provision of suitable maps, including digital maps.

a) A map of the site, with clearly delineated boundaries, is included as:

i) **hard copy** (required for inclusion of site in the Ramsar List): *yes* ✓ -or- *no* □;
ii) **an electronic format** (e.g. a JPEG or ArcView image) Yes
iii) a **GIS file providing geo-referenced site boundary vectors and attribute tables** *yes* ✓ -or- *no* □;

b) Describe briefly the type of boundary delineation applied:

e.g. the boundary is the same as an existing protected area (nature reserve, national park etc.), or follows a catchment boundary, or follows a geopolitical boundary such as a local government jurisdiction, follows physical boundaries such as roads, follows the shoreline of a waterbody, etc.

The site boundary is the same as, or falls within, an existing protected area.

For precise boundary details, please refer to paper map provided at designation

8. Geographical coordinates (latitude/longitude):

051 57 16 N 001 09 38 E

9. General location:

Include in which part of the country and which large administrative region(s), and the location of the nearest large town.

Nearest town/city: Felixstowe

The Stour Estuary forms the south-eastern part of Essex/Suffolk boundary.

The Orwell Estuary is a relatively long and narrow estuary with extensive mudflats and some saltmarsh, running from Ipswich in the north, southwards towards Felixstowe.

Administrative region: Essex; Suffolk

10. Elevation (average and/or max. & min.) (metres): **11. Area** (hectares): 3676.92

Min. -1
Max. 3
Mean 0

12. General overview of the site:

Provide a short paragraph giving a summary description of the principal ecological characteristics and importance of the wetland.

The Stour and Orwell Estuaries is a wetland of international importance, comprising extensive mudflats, low cliffs, saltmarsh and small areas of vegetated shingle on the lower reaches. It provides habitats for an important assemblage of wetland birds in the non-breeding season and supports internationally important numbers of wintering and passage wildfowl and waders. The site also holds several nationally scarce plants and British Red Data Book invertebrates.

13. Ramsar Criteria:

Circle or underline each Criterion applied to the designation of the Ramsar site. See Annex II of the *Explanatory Notes and Guidelines* for the Criteria and guidelines for their application (adopted by Resolution VII.11).

2, 5, 6

14. Justification for the application of each Criterion listed in 13 above:

Provide justification for each Criterion in turn, clearly identifying to which Criterion the justification applies (see Annex II for guidance on acceptable forms of justification).

Ramsar criterion 2

Contains seven nationally scarce plants: stiff saltmarsh-grass *Puccinellia rupestris*; small cord-grass *Spartina maritima*; perennial glasswort *Sarcocornia perennis*; lax-flowered sea lavender *Limonium humile*; and the eelgrasses *Zostera angustifolia*, *Z. marina* and *Z. noltei*.

Contains five British Red Data Book invertebrates: the muscid fly *Phaonia fusca*; the horsefly *Haematopota grandis*; two spiders, *Arctosa fulvolineata* and *Baryphema duffeyi*; and the Endangered swollen spire snail *Mercuria confusa*.

Ramsar criterion 5

Assemblages of international importance:

Species with peak counts in winter:
63017 waterfowl (5 year peak mean 1998/99-2002/2003)

Ramsar criterion 6 – species/populations occurring at levels of international importance.

Qualifying Species/populations (as identified at designation):
Species with peak counts in spring/autumn:

Common redshank , *Tringa totanus totanus*,	2588 individuals, representing an average of 2% of the population (5-year peak mean 1995/96-1999/2000)

Species with peak counts in winter:

Dark-bellied brent goose, *Branta bernicla bernicla*,	2627 individuals, representing an average of 1.2% of the population (5-year peak mean 1995/96-1999/2000)
Northern pintail , *Anas acuta*, NW Europe	741 individuals, representing an average of 1.2% of the population (5-year peak mean 1995/96-1999/2000)
Grey plover , *Pluvialis squatarola*, E Atlantic/W Africa -wintering	3261 individuals, representing an average of 1.3% of the population (5-year peak mean 1995/96-1999/2000)
Red knot , *Calidris canutus islandica*, W & Southern Africa (wintering)	5970 individuals, representing an average of 1.3% of the population (5-year peak mean 1995/96-1999/2000)
Dunlin , *Calidris alpina alpina*, W Siberia/W Europe	19114 individuals, representing an average of 1.4% of the population (5-year peak mean 1995/96-1999/2000)
Black-tailed godwit , *Limosa limosa islandica*, Iceland/W Europe	2559 individuals, representing an average of 7.3% of the population (5-year peak mean 1995/96-1999/2000)
Common redshank , *Tringa totanus totanus*,	3687 individuals, representing an average of 2.8% of the population (5-year peak mean 1995/96-1999/2000)

Contemporary data and information on waterbird trends at this site and their regional (sub-national) and national contexts can be found in the Wetland Bird Survey report, which is updated annually. See www.bto.org/survey/webs/webs-alerts-index.htm.
Details of bird species occuring at levels of National importance are given in Section 22

15. Biogeography (required when Criteria 1 and/or 3 and /or certain applications of Criterion 2 are applied to the designation):

Name the relevant biogeographic region that includes the Ramsar site, and identify the biogeographic regionalisation system that has been applied.

a) biogeographic region:

Atlantic

b) biogeographic regionalisation scheme (include reference citation):

Council Directive 92/43/EEC

16. Physical features of the site:

Describe, as appropriate, the geology, geomorphology; origins - natural or artificial; hydrology; soil type; water quality; water depth, water permanence; fluctuations in water level; tidal variations; downstream area; general climate, etc.

Soil & geology	shingle, sand, mud
Geomorphology and landscape	lowland, coastal, valley, subtidal sediments (including sandbank/mudbank), intertidal sediments (including sandflat/mudflat), estuary
Nutrient status	
pH	
Salinity	brackish / mixosaline, fresh, saline / euhaline
Soil	no information
Water permanence	usually permanent
Summary of main climatic features	Annual averages (Lowestoft, 1971–2000) (www.metoffice.com/climate/uk/averages/19712000/sites/lowestoft.html) Max. daily temperature: 13.0° C Min. daily temperature: 7.0° C Days of air frost: 27.8 Rainfall: 576.3 mm Hrs. of sunshine: 1535.5

General description of the Physical Features:

The Stour and Orwell estuaries include extensive mudflats, low cliffs, saltmarsh and small areas of vegetated shingle on the lower reaches. The site also includes an area of low-lying grazing marsh at Shotley Marshes on the south side of the Orwell.

17. Physical features of the catchment area:

Describe the surface area, general geology and geomorphological features, general soil types, general land use, and climate (including climate type).

The Stour and Orwell estuaries include extensive mudflats, low cliffs, saltmarsh and small areas of vegetated shingle on the lower reaches. The site also includes an area of low-lying grazing marsh at Shotley Marshes on the south side of the Orwell.

18. Hydrological values:

Describe the functions and values of the wetland in groundwater recharge, flood control, sediment trapping, shoreline stabilization, etc.

Sediment trapping

19. Wetland types:

Inland wetland, Marine/coastal wetland

Code	Name	% Area
G	Tidal flats	44.2

H	Salt marshes	35
F	Estuarine waters	19.8
4	Seasonally flooded agricultural land	0.7
E	Sand / shingle shores (including dune systems)	0.3

20. General ecological features:

Provide further description, as appropriate, of the main habitats, vegetation types, plant and animal communities present in the Ramsar site, and the ecosystem services of the site and the benefits derived from them.

Orwell is a relatively long and narrow estuary with extensive mudflats bordering the channel that support large patches of eelgrass *Zostera* sp. The saltmarsh tends to be sandy and fairly calcareous with a wide range of communities. There are small areas of vegetated shingle on the foreshore of the lower reaches. Grazing marshes adjoin the estuary at Shotley. The Stour estuary is a relatively simply structured estuary with a sandy outer area and a muddier inner section. The mud is rich in invertebrates and there are areas of higher saltmarsh. The shoreline vegetation varies from oak-dominated wooded cliffs, through scrub-covered banks to coarse grasses over seawalls, with reed-filled borrow dykes behind.

Ecosystem services

21. Noteworthy flora:

Provide additional information on particular species and why they are noteworthy (expanding as necessary on information provided in **12**. Justification for the application of the Criteria) indicating, e.g. which species/communities are unique, rare, endangered or biogeographically important, etc. *Do not include here taxonomic lists of species present – these may be supplied as supplementary information to the RIS.*

Nationally important species occurring on the site.

Higher Plants.

Puccinellia rupestris (nationally scarce); *Spartina maritima* (nationally scarce); *Sarcocornia perennis* (nationally scarce); *Limonium humile* (nationally scarce); *Zostera angustifolia* (nationally scarce); *Zostera marina* (nationally scarce); *Zostera noltei* (nationally scarce).

22. Noteworthy fauna:

Provide additional information on particular species and why they are noteworthy (expanding as necessary on information provided in **12**. Justification for the application of the Criteria) indicating, e.g. which species/communities are unique, rare, endangered or biogeographically important, etc., including count data. *Do not include here taxonomic lists of species present – these may be supplied as supplementary information to the RIS.*

Birds

Species currently occurring at levels of national importance:

Species regularly supported during the breeding season:

Pied avocet , *Recurvirostra avosetta*, W Europe — 21 pairs, representing an average of 2.8% of the GB population (5-year peak mean 1996-2000)

Species with peak counts in spring/autumn:

Ringed plover , *Charadrius hiaticula*, Europe/Northwest Africa — 638 individuals, representing an average of 2.1% of the GB population (5-year peak mean 1995/96-1999/2000)

Species with peak counts in winter:

Great crested grebe , *Podiceps cristatus cristatus*, NW Europe — 245 individuals, representing an average of 1.5% of the GB population (5-year peak mean 1995/96-1999/2000)

Great cormorant , *Phalacrocorax carbo carbo*, NW Europe — 232 individuals, representing an average of 1% of the GB population (5-year peak mean 1995/96-1999/2000)

Common shelduck , *Tadorna tadorna*, NW Europe	2955 individuals, representing an average of 3.8% of the GB population (5-year peak mean 1995/96-1999/2000)
Eurasian curlew , *Numenius arquata arquata*, N. a. arquata Europe (breeding)	1824 individuals, representing an average of 1.2% of the GB population (5-year peak mean 1995/96-1999/2000)
Ruddy turnstone , *Arenaria interpres interpres*, NE Canada, Greenland/W Europe & NW Africa	690 individuals, representing an average of 1.4% of the GB population (5-year peak mean 1995/96-1999/2000)

Species Information

Nationally important species occurring on the site.

Invertebrates.

Phaonia fusca; *Haematopota grandis* (Meigen) (RDB3); *Arctosa fulvolineata* (RDB3); *Baryphyma duffeyi* (RDB3); *Mercuria* (=*Pseudamnicola*) *confusa* (RDB1).

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23. Social and cultural values:

Describe if the site has any general social and/or cultural values e.g. fisheries production, forestry, religious importance, archaeological sites, social relations with the wetland, etc. Distinguish between historical/archaeological/religious significance and current socio-economic values.

Aesthetic
Archaeological/historical site
Livestock grazing
Non-consumptive recreation
Sport hunting
Tourism
Transportation/navigation

b) Is the site considered of international importance for holding, in addition to relevant ecological values, examples of significant cultural values, whether material or non-material, linked to its origin, conservation and/or ecological functioning? No

If Yes, describe this importance under one or more of the following categories:

i) sites which provide a model of wetland wise use, demonstrating the application of traditional knowledge and methods of management and use that maintain the ecological character of the wetland:

ii) sites which have exceptional cultural traditions or records of former civilizations that have influenced the ecological character of the wetland:

iii) sites where the ecological character of the wetland depends on the interaction with local communities or indigenous peoples:

iv) sites where relevant non-material values such as sacred sites are present and their existence is strongly linked with the maintenance of the ecological character of the wetland:

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24. Land tenure/ownership:

Ownership category	On-site	Off-site
Non-governmental organisation (NGO)	+	
Local authority, municipality etc.	+	

National/Crown Estate	+	
Private	+	+

25. Current land (including water) use:

Activity	On-site	Off-site
Nature conservation	+	
Tourism	+	+
Recreation	+	+
Cutting of vegetation (small-scale/subsistence)	+	
Bait collection	+	
Permanent arable agriculture		+
Grazing (unspecified)	+	
Hunting: recreational/sport	+	
Sewage treatment/disposal	+	
Harbour/port	+	
Flood control	+	
Transport route	+	+
Urban development		+
Non-urbanised settlements	+	+

26. Factors (past, present or potential) adversely affecting the site's ecological character, including changes in land (including water) use and development projects:

Explanation of reporting category:

1. *Those factors that are still operating, but it is unclear if they are under control, as there is a lag in showing the management or regulatory regime to be successful.*
2. *Those factors that are not currently being managed, or where the regulatory regime appears to have been ineffective so far.*

NA = Not Applicable because no factors have been reported.

Adverse Factor Category	Reporting Category	Description of the problem (Newly reported Factors only)	On-Site	Off-Site	Major Impact?
Erosion	2	Natural coastal processes exacerbated by fixed sea defences, port development and maintenance dredging.	+		+

For category 2 factors only.
What measures have been taken / are planned / regulatory processes invoked, to mitigate the effect of these factors?
Erosion - Erosion is being tackled through sediment replacement for additional erosion that can be attributed to port development and maintenance dredging. A realignment site has been created on-site to make up for the loss of habitat due to capital dredging. General background erosion has not been tackled although a Flood Management Strategy for the site is being produced.

Is the site subject to adverse ecological change? YES

27. Conservation measures taken:

List national category and legal status of protected areas, including boundary relationships with the Ramsar site; management practices; whether an officially approved management plan exists and whether it is being implemented.

Conservation measure	On-site	Off-site
Site/ Area of Special Scientific Interest (SSSI/ASSI)	+	
Special Protection Area (SPA)	+	
Land owned by a non-governmental organisation for nature conservation	+	
Management agreement	+	
Site management statement/plan implemented	+	
Area of Outstanding National Beauty (AONB)	+	+

b) Describe any other current management practices:

The management of Ramsar sites in the UK is determined by either a formal management plan or through other management planning processes, and is overseen by the relevant statutory conservation agency. Details of the precise management practises are given in these documents.

28. Conservation measures proposed but not yet implemented:

e.g. management plan in preparation; official proposal as a legally protected area, etc.

No information available

29. Current scientific research and facilities:

e.g. details of current research projects, including biodiversity monitoring; existence of a field research station, etc.

Fauna.

Numbers of migratory and wintering wildfowl and waders are monitored annually as part of the national Wetland Birds Survey (WeBS) organised by the British Trust for Ornithology, Wildfowl & Wetlands Trust, the Royal Society for the Protection of Birds and the Joint Nature Conservation Committee.

High tide bird counts.

Environment, Flora and Fauna.

Vegetation, bird and invertebrate surveys/monitoring carried out on NGO reserves.

30. Current communications, education and public awareness (CEPA) activities related to or benefiting the site:

e.g. visitor centre, observation hides and nature trails, information booklets, facilities for school visits, etc.

None reported

31. Current recreation and tourism:

State if the wetland is used for recreation/tourism; indicate type(s) and their frequency/intensity.

Activities, Facilities provided and Seasonality.

A popular area for tourists as it is within an AONB. There are more visitors in the summer. However it is well used throughout the year by walkers, bird watches and for sailing.

32. Jurisdiction:

Include territorial, e.g. state/region, and functional/sectoral, e.g. Dept. of Agriculture/Dept. of Environment, etc.

Head, Natura 2000 and Ramsar Team, Department for Environment, Food and Rural Affairs, European Wildlife Division, Zone 1/07, Temple Quay House, 2 The Square, Temple Quay, Bristol, BS1 6EB

33. Management authority:

Provide the name and address of the local office(s) of the agency(ies) or organisation(s) directly responsible for managing the wetland. Wherever possible provide also the title and/or name of the person or persons in this office with responsibility for the wetland.

Site Designations Manager, English Nature, Sites and Surveillance Team, Northminster House, Northminster Road, Peterborough, PE1 1UA, UK

34. Bibliographical references:

Scientific/technical references only. If biogeographic regionalisation scheme applied (see **15** above), list full reference citation for the scheme.

Site-relevant references

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Please return to: **Ramsar Secretariat, Rue Mauverney 28, CH-1196 Gland, Switzerland**
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EC Directive 79/409 on the Conservation of Wild Birds
Special Protection Area (SPA)

Name: Stour and Orwell Estuaries

Unitary Authority/County: Essex, Suffolk.

Site description: The Stour and Orwell estuaries straddle the eastern part of the Essex/Suffolk border in eastern England. The SPA is coincident with Cattawade Marshes Site of Special Scientific Interest (SSSI), Orwell Estuary SSSI and Stour Estuary SSSI. The estuaries include extensive mud-flats, low cliffs, saltmarsh and small areas of vegetated shingle on the lower reaches. The mud-flats hold *Enteromorpha*, *Zostera* and *Salicornia* spp. The site also includes areas of low-lying grazing marsh at Shotley Marshes on the south side of the Orwell and at Cattawade Marshes at the head of the Stour. Trimley Marshes on the north side of the Orwell includes several shallow freshwater pools, as well as areas of grazing marsh, and is managed as a nature reserve by the Suffolk Wildlife Trust. In summer, the site supports important numbers of breeding avocet *Recurvirostra avosetta*, while in winter it holds major concentrations of waterbirds, especially geese, ducks and waders. The geese also feed, and some waders roost, in surrounding areas of agricultural land outside the SPA. The site has close ecological links with the Hamford Water and Mid-Essex Coast SPAs, lying to the south on the same coast.

Size of SPA: The SPA covers an area of 3,676.92 ha.

Qualifying species:
The site qualifies under **article 4.1** of the Directive (79/409/EEC) as it is used regularly by 1% or more of the Great Britain populations of the following species listed in Annex I in any season:

Annex 1 species	Count and season	Period	% of GB population
Avocet *Recurvirostra avosetta*	21 pairs - breeding	5 year peak mean 1996 – 2000	3.6%

The site qualifies under **article 4.2** of the Directive (79/409/EEC) as it is used regularly by 1% or more of the biogeographical populations of the following regularly occurring migratory species (other than those listed in Annex I) in any season:

Migratory species	Count and season	Period	% of subspecies/population
Redshank *Tringa totanus*	2,588 individuals – autumn passage	5 year peak mean 1995/96 – 1999/2000	2.0% *brittanica*
Dark-bellied brent goose *Branta bernicla bernicla*	2,627 individuals - wintering	5 year peak mean 1995/96 – 1999/2000	1.2% *bernicla*, Western Siberia (breeding)
Pintail *Anas acuta*	741 individuals - wintering	5 year peak mean 1995/96 – 1999/2000	1.2% Northwestern Europe (non-breeding)
Grey plover *Pluvialis squatarola*	3,261 individuals - wintering	5 year peak mean 1995/96 – 1999/2000	1.3% Eastern Atlantic (non-breeding)
Knot *Calidris canutus islandica*	5,970 individuals - wintering	5 year peak mean 1995/96 – 1999/2000	1.3% *islandica*
Dunlin *Calidris alpina alpina*	19,114 individuals - wintering	5 year peak mean 1995/96 – 1999/2000	1.4% *alpina*, Western Europe (non-breeding)
Black-tailed godwit *Limosa limosa islandica*	2,559 individuals - wintering	5 year peak mean 1995/96 – 1999/2000	7.3% *islandica*
Redshank *Tringa totanus*	3,687 individuals - wintering	5 year peak mean 1995/96 – 1999/2000	2.8% *brittanica*

Bird counts from: Wetland Bird Survey (WeBS) database.

Assemblage qualification:
The site qualifies under **article 4.2** of the Directive (79/409/EEC) as it is used regularly by over 20,000 waterbirds (waterbirds as defined by the Ramsar Convention) in any season:

In the non-breeding season, the area regularly supports 63,017 individual waterbirds (5 year peak mean 1993/94 - 1997/98), including great crested grebe *Podiceps cristatus*, cormorant *Phalacrocorax carbo*, dark-bellied brent goose *Branta bernicla bernicla*, shelduck *Tadorna tadorna*, wigeon *Anas penelope*, gadwall *Anas strepera*, pintail *Anas acuta*, goldeneye *Bucephala clangula*, ringed plover *Charadrius hiaticula*, grey plover *Pluvialis squatarola*, lapwing *Vanellus vanellus*, knot *Calidris canutus islandica*, dunlin *Calidris alpina alpina*, black-tailed godwit *Limosa limosa islandica*, curlew *Numenius arquata*, redshank *Tringa totanus* and turnstone *Arenaria interpres*.

Non-qualifying species of interest: The SPA/Ramsar site as a whole, including the proposed extensions, is used by non-breeding marsh harrier *Circus aeruginosus*, hen harrier *Circus cyaneus*, merlin *Falco columbarius*, peregrine *Falco peregrinus*, short-eared owl *Asio flammeus* and kingfisher *Alcedo atthis* (all species listed in Annex I of the EC Birds Directive) in numbers of less than European importance (less than 1% GB population). It also supports breeding common tern *Sterna hirundo*, little tern *Sterna albifrons* and kingfisher (all listed in Annex I) in numbers of less than European importance.

Status of SPA:
1) Stour and Orwell Estuaries was classified as a Special Protection Area on 13 July 1994.
2) Extensions to the Stour and Orwell Estuaries SPA were classified on 19 May 2005.

STANDARD DATA FORM for sites within the 'UK national site network of European sites'

Special Protection Areas (SPAs) are classified and Special Areas of Conservation (SACs) are designated under:

- the Conservation of Habitats and Species Regulations 2017 (as amended) in England and Wales (including the adjacent territorial sea) and to a limited extent in Scotland (reserved matters) and Northern Ireland (excepted matters);
- the Conservation (Natural Habitats &c.) Regulations 1994 (as amended) in Scotland;
- the Conservation (Natural Habitats, &c) Regulations (Northern Ireland) 1995 (as amended) in Northern Ireland; and
- the Conservation of Offshore Marine Habitats and Species Regulations 2017 (as amended) in the UK offshore area.

Each SAC or SPA (forming part of the UK national site network of European sites) has its own Standard Data Form containing site-specific information. The information provided here generally follows the same documenting format for SACs and SPAs, as set out in the Official Journal of the European Union recording the Commission Implementing Decision of 11 July 2011 (2011/484/EU).

Please note that these forms contain a number of codes, all of which are explained either within the data forms themselves or in the end notes.

More general information on SPAs and SACs in the UK is available from the SPA homepage and SAC homepage on the JNCC website. These webpages also provide links to Standard Data Forms for all SAC and SPA sites in the UK.

https://jncc.gov.uk/

NATURA 2000 - STANDARD DATA FORM

For Special Protection Areas (SPA),
Proposed Sites for Community Importance (pSCI),
Sites of Community Importance (SCI) and
for Special Areas of Conservation (SAC)

SITE **UK9009121**

SITENAME **Stour and Orwell Estuaries**

TABLE OF CONTENTS

1. SITE IDENTIFICATION

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1.1 Type	1.2 Site code
A	UK9009121

1.3 Site name

Stour and Orwell Estuaries

1.4 First Compilation date	1.5 Update date
1994-07	2015-12

1.6 Respondent:

Name/Organisation:	Joint Nature Conservation Committee
Address:	Joint Nature Conservation Committee Monkstone House City Road Peterborough PE1 1JY
Email:	

1.7 Site indication and designation / classification dates

Date site classified as SPA:	1994-07
National legal reference of SPA designation	Regulations 12A and 13-15 of the Conservation Habitats and Species Regulations 2010, (http://www.legislation.gov.uk/uksi/2010/490/contents/made) as amended by The Conservation of Habitats and Species (Amendment) Regulations 2011 (http://www.legislation.gov.uk/uksi/2011/625/contents/made).

2. SITE LOCATION

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2.1 Site-centre location [decimal degrees]:

Longitude	Latitude
1.160555556	51.95444444

2.2 Area [ha]:

3667.37

2.3 Marine area [%]

85.6

2.4 Sitelength [km]:

0.0

2.5 Administrative region code and name

NUTS level 2 code	Region Name
UKH1	East Anglia
UKH3	Essex

2.6 Biogeographical Region(s)

Atlantic (100.0 %)

3. ECOLOGICAL INFORMATION

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3.2 Species referred to in Article 4 of Directive 2009/147/EC and listed in Annex II of Directive 92/43/EEC and site evaluation for them

Species					Population in the site						Site assessment			
G	Code	Scientific Name	S	NP	T	Size		Unit	Cat.	D.qual.	A|B|C|D	A|B|C		
						Min	Max				Pop.	Con.	Iso.	Glo
B	A054	Anas acuta			w	741	741	i		G	B		C	
B	A050	Anas penelope			w	3979	3979	i		G	C		C	
B	A051	Anas strepera			w	97	97	i		G	C		C	
B	A169	Arenaria interpres			w	690	690	i		G	C		C	
B	A062	Aythya marila			w	28	28	i		G	C		C	
B	A675	Branta bernicla bernicla			w	2627	2627	i		G	B		C	
B	A067	Bucephala clangula			w	213	213	i		G	C		C	
B	A672	Calidris alpina alpina			w	19114	19114	i		G	B		C	
B	A143	Calidris canutus			w	5970	5970	i		G	C		C	

B	A137	Charadrius hiaticula			w	372	372	i		G	B		C	
B	A137	Charadrius hiaticula			c	638	638	i		G	B		C	
B	A036	Cygnus olor			w	239	239	i		G	C		C	
B	A616	Limosa limosa islandica			w	2559	2559	i		G	A		C	
B	A160	Numenius arquata			w	2153	2153	i		G	C		C	
B	A017	Phalacrocorax carbo			w	232	232	i		G	C		C	
B	A140	Pluvialis apricaria			w	773	773	i		G	C		C	
B	A141	Pluvialis squatarola			w	3261	3261	i		G	B		C	
B	A005	Podiceps cristatus			w	245	245	i		G	C		C	
B	A132	Recurvirostra avosetta			r	21	21	p		G	B		C	
B	A048	Tadorna tadorna			w	2955	2955	i		G	B		C	
B	A162	Tringa totanus			c	2588	2588	i		G	B		C	
B	A162	Tringa totanus			w	3687	3687	i		G	B		C	
B	A142	Vanellus vanellus			w	6242	6242	i		G	C		C	

- **Group:** A = Amphibians, B = Birds, F = Fish, I = Invertebrates, M = Mammals, P = Plants, R = Reptiles
- **S:** in case that the data on species are sensitive and therefore have to be blocked for any public access enter: yes
- **NP:** in case that a species is no longer present in the site enter: x (optional)
- **Type:** p = permanent, r = reproducing, c = concentration, w = wintering (for plant and non-migratory species use permanent)
- **Unit:** i = individuals, p = pairs or other units according to the Standard list of population units and codes in accordance with Article 12 and 17 reporting (see reference portal)
- **Abundance categories (Cat.):** C = common, R = rare, V = very rare, P = present - to fill if data are deficient (DD) or in addition to population size information
- **Data quality:** G = 'Good' (e.g. based on surveys); M = 'Moderate' (e.g. based on partial data with some extrapolation); P = 'Poor' (e.g. rough estimation); VP = 'Very poor' (use this category only, if not even a rough estimation of the population size can be made, in this case the fields for population size can remain empty, but the field "Abundance categories" has to be filled in)

3.3 Other important species of flora and fauna (optional)

Species					Population in the site				Motivation					
Group	CODE	Scientific Name	S	NP	Size		Unit	Cat.	Species Annex		Other categories			
					Min	Max		C|R|V|P	IV	V	A	B	C	D
B	WATR	Waterbird assemblage			63017	63017	i						X	

- **Group:** A = Amphibians, B = Birds, F = Fish, Fu = Fungi, I = Invertebrates, L = Lichens, M = Mammals, P = Plants, R = Reptiles
- **CODE:** for Birds, Annex IV and V species the code as provided in the reference portal should be used in addition to the scientific name
- **S:** in case that the data on species are sensitive and therefore have to be blocked for any public access enter: yes
- **NP:** in case that a species is no longer present in the site enter: x (optional)
- **Unit:** i = individuals, p = pairs or other units according to the standard list of population units and codes in accordance with Article 12 and 17 reporting, (see reference portal)
- **Cat.:** Abundance categories: C = common, R = rare, V = very rare, P = present
- **Motivation categories: IV, V:** Annex Species (Habitats Directive), **A:** National Red List data; **B:** Endemics; **C:** International Conventions; **D:** other reasons

4. SITE DESCRIPTION

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4.1 General site character

Habitat class	% Cover
N16	0.2
N06	0.8
N07	5.5
N02	88.0
N05	0.5
N03	5.0
Total Habitat Cover	100

Other Site Characteristics

1 Terrestrial: Soil & Geology: sand,shingle,clay,alluvium,neutral,mud 2 Terrestrial: Geomorphology and landscape: coastal,lowland 3 Marine: Geology: mud,clay,shingle,sand 4 Marine: Geomorphology: intertidal sediments (including sandflat/mudflat),estuary,lagoon,subtidal sediments (including sandbank/mudbank) Ramsar Wetland Types: Marine and coastal wetlands

4.2 Quality and importance

ARTICLE 4.1 QUALIFICATION (79/409/EEC) During the breeding season the area regularly supports: Recurvirostra avosetta (Western Europe/Western Mediterranean - breeding) 3.6% of the population in Great Britain 5-year peak mean 1996-2000 ARTICLE 4.2 QUALIFICATION (79/409/EEC) Over winter the area regularly supports: Anas acuta (North-western Europe) 1.2% of the population 5-year peak mean 1995/96-1999/2000 Branta bernicla bernicla (Western Siberia/Western Europe) 1.2% of the population 5-year peak mean 1995/96-1999/2000 Calidris alpina alpina (Northern Siberia/Europe/Western Africa) 1.4% of the population 5-year peak mean 1995/96-1999/2000 Calidris canutus (North-eastern Canada/Greenland/Iceland/North-western Europe) 1.3% of the population 5-year peak mean 1995/96-1999/2000 Limosa limosa islandica (Iceland - breeding) 7.3% of the population 5-year peak mean 1995/96-1999/2000 Pluvialis squatarola (Eastern Atlantic - wintering) 1.3% of the population 5-year peak mean 1995/96-1999/2000 Tringa totanus (Eastern Atlantic - wintering) 2.8% of the population 5-year peak mean 1995/96-1999/2000 On passage the area regularly supports: Tringa totanus (Eastern Atlantic - wintering) 2% of the population 5-year peak mean 1995/96-1999/2000 ARTICLE 4.2 QUALIFICATION (79/409/EEC): AN INTERNATIONALLY IMPORTANT ASSEMBLAGE OF BIRDS Over winter the area regularly supports: 63017 waterfowl (5 year peak mean 1991/92-1995/96) Including: Podiceps cristatus , Phalacrocorax carbo , Branta bernicla bernicla , Tadorna tadorna , Anas penelope , Anas strepera , Anas acuta , Bucephala clangula , Charadrius hiaticula , Pluvialis squatarola , Vanellus vanellus , Calidris canutus , Calidris alpina alpina , Limosa limosa islandica , Numenius arquata , Tringa totanus , Arenaria interpres

4.3 Threats, pressures and activities with impacts on the site

The most important impacts and activities with high effect on the site

Negative Impacts	Positive Impacts

Rank	Threats and pressures [code]	Pollution (optional) [code]	inside/outside [i|o|b]
H	M02		B
H	E06		B
H	F02		I
H	G01		I
H	M01		B

Rank	Activities, management [code]	Pollution (optional) [code]	inside/outside [i|o|b]
H	A02		I
H	A04		I
H	B02		I
H	D05		I
H	G03		I

Rank: H = high, M = medium, L = low
Pollution: N = Nitrogen input, P = Phosphor/Phosphate input, A = Acid input/acidification,
T = toxic inorganic chemicals, O = toxic organic chemicals, X = Mixed pollutions
i = inside, o = outside, b = both

4.5 Documentation

Conservation Objectives - the Natural England links below provide access to the Conservation Objectives (and other site-related information) for its terrestrial and inshore Natura 2000 sites, including conservation advice packages and supporting documents for European Marine Sites within English waters and for cross-border sites. See also the 'UK Approach' document for more information (link via the JNCC website).

Link(s): http://publications.naturalengland.org.uk/category/6490068894089216

http://publications.naturalengland.org.uk/category/3212324
http://jncc.defra.gov.uk/pdf/Natura2000_StandardDataForm_UKApproach_Dec2015.pdf

5. SITE PROTECTION STATUS (optional)

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5.1 Designation types at national and regional level:

Code	Cover [%]	Code	Cover [%]	Code	Cover [%]
UK04	90.4				

6. SITE MANAGEMENT

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6.1 Body(ies) responsible for the site management:

Organisation:	Natural England
Address:	
Email:	

6.2 Management Plan(s):

An actual management plan does exist:

- [ ] Yes
- [ ] No, but in preparation
- [X] No

6.3 Conservation measures (optional)

For available information, including on Conservation Objectives, see Section 4.5.

EXPLANATION OF CODES USED IN THE SPECIAL AREA OF CONSERVATION (SAC) AND SPECIAL PROTECTION AREA (SPA) STANDARD DATA FORMS

The codes in the table below generally follow those explained in the official European Union guidelines for the Standard Data Form (also referencing the relevant page number).

1.1 Site type

CODE	DESCRIPTION	PAGE NO
A	SPA (classified Special Protection Area)	53
B	cSAC, SCI or SAC (candidate Special Area of Conservation, Site of Community Importance, designated Special Area of Conservation)	53
C	SPA area/boundary is the same as the cSAC/SCI/SAC i.e. a co-classified/designated site (Note: this situation only occurs in Gibraltar)	53

3.1 Habitat code

CODE	DESCRIPTION	PAGE NO
1110	Sandbanks which are slightly covered by sea water all the time	57
1130	Estuaries	57
1140	Mudflats and sandflats not covered by seawater at low tide	57
1150	Coastal lagoons	57
1160	Large shallow inlets and bays	57
1170	Reefs	57
1180	Submarine structures made by leaking gases	57
1210	Annual vegetation of drift lines	57
1220	Perennial vegetation of stony banks	57
1230	Vegetated sea cliffs of the Atlantic and Baltic Coasts	57
1310	Salicornia and other annuals colonizing mud and sand	57
1320	Spartina swards (Spartinion maritimae)	57
1330	Atlantic salt meadows (Glauco-Puccinellietalia maritimae)	57
1340	Inland salt meadows	57
1420	Mediterranean and thermo-Atlantic halophilous scrubs (Sarcocornetea fruticosi)	57
2110	Embryonic shifting dunes	57
2120	Shifting dunes along the shoreline with Ammophila arenaria ("white dunes")	57
2130	Fixed coastal dunes with herbaceous vegetation ("grey dunes")	57
2140	Decalcified fixed dunes with Empetrum nigrum	57
2150	Atlantic decalcified fixed dunes (Calluno-Ulicetea)	57
2160	Dunes with Hippopha• rhamnoides	57
2170	Dunes with Salix repens ssp. argentea (Salicion arenariae)	57
2190	Humid dune slacks	57
21A0	Machairs (* in Ireland)	57
2250	Coastal dunes with Juniperus spp.	57
2330	Inland dunes with open Corynephorus and Agrostis grasslands	57
3110	Oligotrophic waters containing very few minerals of sandy plains (Littorelletalia uniflorae)	57
3130	Oligotrophic to mesotrophic standing waters with vegetation of the Littorelletea uniflorae and/or of the Isoëto-Nanojuncetea	57
3140	Hard oligo-mesotrophic waters with benthic vegetation of Chara spp.	57
3150	Natural eutrophic lakes with Magnopotamion or Hydrocharition - type vegetation	57

CODE	DESCRIPTION	PAGE NO
3160	Natural dystrophic lakes and ponds	57
3170	Mediterranean temporary ponds	57
3180	Turloughs	57
3260	Water courses of plain to montane levels with the Ranunculion fluitantis and Callitricho-Batrachion vegetation	57
4010	Northern Atlantic wet heaths with Erica tetralix	57
4020	Temperate Atlantic wet heaths with Erica ciliaris and Erica tetralix	57
4030	European dry heaths	57
4040	Dry Atlantic coastal heaths with Erica vagans	57
4060	Alpine and Boreal heaths	57
4080	Sub-Arctic Salix spp. scrub	57
5110	Stable xerothermophilous formations with Buxus sempervirens on rock slopes (Berberidion p.p.)	57
5130	Juniperus communis formations on heaths or calcareous grasslands	57
6130	Calaminarian grasslands of the Violetalia calaminariae	57
6150	Siliceous alpine and boreal grasslands	57
6170	Alpine and subalpine calcareous grasslands	57
6210	Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia) (* important orchid sites)	57
6230	Species-rich Nardus grasslands, on silicious substrates in mountain areas (and submountain areas in Continental Europe)	57
6410	Molinia meadows on calcareous, peaty or clayey-silt-laden soils (Molinion caeruleae)	57
6430	Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels	57
6510	Lowland hay meadows (Alopecurus pratensis, Sanguisorba officinalis)	57
6520	Mountain hay meadows	57
7110	Active raised bogs	57
7120	Degraded raised bogs still capable of natural regeneration	57
7130	Blanket bogs (* if active bog)	57
7140	Transition mires and quaking bogs	57
7150	Depressions on peat substrates of the Rhynchosporion	57
7210	Calcareous fens with Cladium mariscus and species of the Caricion davallianae	57
7220	Petrifying springs with tufa formation (Cratoneurion)	57
7230	Alkaline fens	57
7240	Alpine pioneer formations of the Caricion bicoloris-atrofuscae	57
8110	Siliceous scree of the montane to snow levels (Androsacetalia alpinae and Galeopsietalia ladani)	57
8120	Calcareous and calcshist screes of the montane to alpine levels (Thlaspietea rotundifolii)	57
8210	Calcareous rocky slopes with chasmophytic vegetation	57
8220	Siliceous rocky slopes with chasmophytic vegetation	57
8240	Limestone pavements	57
8310	Caves not open to the public	57
8330	Submerged or partially submerged sea caves	57
9120	Atlantic acidophilous beech forests with Ilex and sometimes also Taxus in the shrublayer (Quercion robori-petraeae or Ilici-Fagenion)	57
9130	Asperulo-Fagetum beech forests	57
9160	Sub-Atlantic and medio-European oak or oak-hornbeam forests of the Carpinion betuli	57
9180	Tilio-Acerion forests of slopes, screes and ravines	57
9190	Old acidophilous oak woods with Quercus robur on sandy plains	57
91A0	Old sessile oak woods with Ilex and Blechnum in the British Isles	57
91C0	Caledonian forest	57
91D0	Bog woodland	57
91E0	Alluvial forests with Alnus glutinosa and Fraxinus excelsior (Alno-Padion, Alnion incanae, Salicion albae)	57
91J0	Taxus baccata woods of the British Isles	57

3.1 Habitat representativity (abbreviated to 'Representativity' in data form)

CODE	DESCRIPTION	PAGE NO
A	Excellent representatively	57
B	Good representatively	57
C	Significant representatively	57
D	Non-significant presence representatively	57

3.1 Relative surface

CODE	DESCRIPTION	PAGE NO
A	> 15%-100%	58
B	> 2%-15%	58
C	≤ 2%	58

3.1 Degree of conservation (abbreviated to 'Conservation' in data form)

CODE	DESCRIPTION	PAGE NO
A	Excellent conservation	59
B	Good conservation	59
C	Average or reduced conservation	59

3.1 Global assessment (abbreviated to 'Global' in data form)

CODE	DESCRIPTION	PAGE NO
A	Excellent value	59
B	Good value	59
C	Significant value	59

3.2 Population (abbreviated to 'Pop.' in data form)

CODE	DESCRIPTION	PAGE NO
A	> 15%-100%	62
B	> 2%-15%	62
C	≤ 2%	62
D	Non-significant population	62

3.2 Degree of conservation (abbreviated to 'Con.' in data form)

CODE	DESCRIPTION	PAGE NO
A	Excellent conservation	63
B	Good conservation	63
C	Average or reduced conservation	63

3.2 Isolation (abbreviated to 'Iso.' in data form)

CODE	DESCRIPTION	PAGE NO
A	Population (almost) Isolated	63
B	Population not-isolated, but on margins of area of distribution	63
C	Population not-isolated within extended distribution range	63

3.2 Global Grade (abbreviated to 'Glo.' or 'G.' in data form)

CODE	DESCRIPTION	PAGE NO
A	Excellent value	63
B	Good value	63
C	Significant value	63

3.3 Other species – essentially covers bird assemblage types

CODE	DESCRIPTION	PAGE NO
WATR	Non-breeding waterbird assemblage	UK specific code
SBA	Breeding seabird assemblage	UK specific code

BBA	Breeding bird assemblage (applies only to sites classified pre 2000)	UK specific code

4.1 Habitat class code

CODE	DESCRIPTION	PAGE NO
N01	Marine areas, Sea inlets	65
N02	Tidal rivers, Estuaries, Mud flats, Sand flats, Lagoons (including saltwork basins)	65
N03	Salt marshes, Salt pastures, Salt steppes	65
N04	Coastal sand dunes, Sand beaches, Machair	65
N05	Shingle, Sea cliffs, Islets	65
N06	Inland water bodies (Standing water, Running water)	65
N07	Bogs, Marshes, Water fringed vegetation, Fens	65
N08	Heath, Scrub, Maquis and Garrigue, Phygrana	65
N09	Dry grassland, Steppes	65
N10	Humid grassland, Mesophile grassland	65
N11	Alpine and sub-Alpine grassland	65
N14	Improved grassland	65
N15	Other arable land	65
N16	Broad-leaved deciduous woodland	65
N17	Coniferous woodland	65
N19	Mixed woodland	65
N21	Non-forest areas cultivated with woody plants (including Orchards, groves, Vineyards, Dehesas)	65
N22	Inland rocks, Screes, Sands, Permanent Snow and ice	65
N23	Other land (including Towns, Villages, Roads, Waste places, Mines, Industrial sites)	65
N25	Grassland and scrub habitats (general)	65
N26	Woodland habitats (general)	65

4.3 Threats code

CODE	DESCRIPTION	PAGE NO
A01	Cultivation	65
A02	Modification of cultivation practices	65
A03	Mowing / cutting of grassland	65
A04	Grazing	65
A05	Livestock farming and animal breeding (without grazing)	65
A06	Annual and perennial non-timber crops	65
A07	Use of biocides, hormones and chemicals	65
A08	Fertilisation	65
A10	Restructuring agricultural land holding	65
A11	Agriculture activities not referred to above	65
B01	Forest planting on open ground	65
B02	Forest and Plantation management & use	65
B03	Forest exploitation without replanting or natural regrowth	65
B04	Use of biocides, hormones and chemicals (forestry)	65
B06	Grazing in forests/ woodland	65
B07	Forestry activities not referred to above	65
C01	Mining and quarrying	65
C02	Exploration and extraction of oil or gas	65
C03	Renewable abiotic energy use	65
D01	Roads, paths and railroads	65
D02	Utility and service lines	65
D03	Shipping lanes, ports, marine constructions	65
D04	Airports, flightpaths	65
D05	Improved access to site	65
E01	Urbanised areas, human habitation	65
E02	Industrial or commercial areas	65

CODE	DESCRIPTION	PAGE NO
E03	Discharges	65
E04	Structures, buildings in the landscape	65
E06	Other urbanisation, industrial and similar activities	65
F01	Marine and Freshwater Aquaculture	65
F02	Fishing and harvesting aquatic ressources	65
F03	Hunting and collection of wild animals (terrestrial), including damage caused by game (excessive density), and taking/removal of terrestrial animals (including collection of insects, reptiles, amphibians, birds of prey, etc., trapping, poisoning, poaching, predator control, accidental capture (e.g. due to fishing gear), etc.)	65
F04	Taking / Removal of terrestrial plants, general	65
F05	Illegal taking/ removal of marine fauna	65
F06	Hunting, fishing or collecting activities not referred to above	65
G01	Outdoor sports and leisure activities, recreational activities	65
G02	Sport and leisure structures	65
G03	Interpretative centres	65
G04	Military use and civil unrest	65
G05	Other human intrusions and disturbances	65
H01	Pollution to surface waters (limnic & terrestrial, marine & brackish)	65
H02	Pollution to groundwater (point sources and diffuse sources)	65
H03	Marine water pollution	65
H04	Air pollution, air-borne pollutants	65
H05	Soil pollution and solid waste (excluding discharges)	65
H06	Excess energy	65
H07	Other forms of pollution	65
I01	Invasive non-native species	65
I02	Problematic native species	65
I03	Introduced genetic material, GMO	65
J01	Fire and fire suppression	65
J02	Human induced changes in hydraulic conditions	65
J03	Other ecosystem modifications	65
K01	Abiotic (slow) natural processes	65
K02	Biocenotic evolution, succession	65
K03	Interspecific faunal relations	65
K04	Interspecific floral relations	65
K05	Reduced fecundity/ genetic depression	65
L05	Collapse of terrain, landslide	65
L07	Storm, cyclone	65
L08	Inundation (natural processes)	65
L10	Other natural catastrophes	65
M01	Changes in abiotic conditions	65
M02	Changes in biotic conditions	65
U	Unknown threat or pressure	65
XO	Threats and pressures from outside the Member State	65

5.1 Designation type codes

CODE	DESCRIPTION	PAGE NO
UK00	No Protection Status	67
UK01	National Nature Reserve	67
UK04	Site of Special Scientific Interest (GB)	67
UK05	Marine Conservation Zone	67
UK06	Nature Conservation Marine Protected Area	67
UK86	Special Area (Channel Islands)	67
UK98	Area of Special Scientific Interest (NI)	67
IN00	Ramsar Convention site	67
IN08	Special Protection Area	67
IN09	Special Area of Conservation	67

European Site Conservation Objectives for Stour and Orwell Estuaries Special Protection Area Site Code: UK9009121

With regard to the SPA and the individual species and/or assemblage of species for which the site has been classified (the 'Qualifying Features' listed below), and subject to natural change;

Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the aims of the Wild Birds Directive, by maintaining or restoring;

- **The extent and distribution of the habitats of the qualifying features**
- **The structure and function of the habitats of the qualifying features**
- **The supporting processes on which the habitats of the qualifying features rely**
- **The population of each of the qualifying features, and,**
- **The distribution of the qualifying features within the site.**

This document should be read in conjunction with the accompanying *Supplementary Advice* document, which provides more detailed advice and information to enable the application and achievement of the Objectives set out above.

Qualifying Features:

A046a *Branta bernicla bernicla*; Dark-bellied brent goose (Non-breeding)
A054 *Anas acuta*; Northern pintail (Non-breeding)
A132 *Recurvirostra avosetta*; Pied avocet (Breeding)
A141 *Pluvialis squatarola*; Grey plover (Non-breeding)
A143 *Calidris canutus*; Red knot (Non-breeding)
A149 *Calidris alpina alpina*; Dunlin (Non-breeding)
A156 *Limosa limosa islandica*; Black-tailed godwit (Non-breeding)
A162 *Tringa totanus*; Common redshank (Non-breeding)
Waterbird assemblage

www.naturalengland.org.uk

This is a European Marine Site

This SPA is a part of the Stour and Orwell Estuaries European Marine Site (EMS). These Conservation Objectives should be used in conjunction with the Conservation Advice document for the EMS. Natural England's formal Conservation Advice for European Marine Sites can be found via GOV.UK.

Explanatory Notes: European Site Conservation Objectives

These Conservation Objectives are those referred to in the Conservation of Habitats and Species Regulations 2017 (as amended) ('the Habitats Regulations'). They must be considered when a competent authority is required to make a 'Habitats Regulations Assessment' including an Appropriate Assessment, under the relevant parts of this legislation.

These Conservation Objectives, and the accompanying Supplementary Advice (where this is available), will also provide a framework to inform the management of the European Site and the prevention of deterioration of habitats and significant disturbance of its qualifying features

These Conservation Objectives are set for each bird feature for a Special Protection Area (SPA).

Where these objectives are being met, the site will be considered to exhibit a high degree of integrity and to be contributing to achieving the aims of the Wild Birds Directive.

Publication date: 21 February 2019 (version 3). This document updates and replaces an earlier version dated 30 June 2014 to reflect the consolidation of the Habitats Regulations in 2017.

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