The Great Grid Upgrade

North Humber to High Marnham

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Executive Summary

National Grid Electricity Transmission plc (National Grid) is developing the North Humber to High Marnham Project (the Project), a proposed new 400 kV electricity transmission connection between East Riding of Yorkshire and Nottinghamshire. The Project would reinforce the national electricity transmission network, enabling the connection of new low carbon energy generation and supporting the delivery of the UK Government's clean power and net zero ambitions. The Project is a Nationally Significant Infrastructure Project (NSIP) for which development consent is being sought through a Development Consent Order (DCO) under the Planning Act 2008 (HM Government, 2008). It is recognised as a critical reinforcement to provide the network capacity required to meet future electricity demand and support the transition to a low-carbon energy system.

This report has been produced for the purpose of informing a Habitats Regulations Assessment (HRA) in accordance with applicable legislation and Planning Inspectorate advice on HRA. This HRA report discusses the impacts of the Project on habitats designated as European sites under Regulation 8 of The Conservation of Habitats and Species Regulations 2017 (HM Government, 2017) known as the 'Habitats Regulations', Ramsar sites as defined in Regulation 3 of The Conservation of Habitats and Species Regulations 2017 (HM Government, 2017), and sites that Government policy advises should be treated as though they were European sites.

As the Project is not directly connected with or necessary for the conservation management of a European site, and it is not possible to rule out the risk of it having a significant effect on a European site on its own or in combination with other proposals, the first step of the HRA process was considered; the test of Likely Significant Effects (LSEs) (HRA Stage 1: Screening) which assesses whether the Project, without any detailed appraisal, is likely to result in a significant effect upon the conservation objectives of a European site.

The HRA Screening considered the following European sites:

- Humber Estuary Special Area of Conservation (SAC) (UK0030170);
- Humber Estuary Special Protection Area (SPA) (UK9006111);
- Humber Estuary Ramsar site (UK11031);
- Thorne and Hatfield Moors SPA (UK9005171);
- Thorne Moor SAC (UK0012915); and
- Hatfield Moor SAC (UK0030166).

The assessment considered a range of impact pathways associated with both the construction and operational phases of the Project, including loss of functionally linked land (FLL), disturbance, air quality, hydrological changes, barriers to movement, injury and mortality, and the spread of invasive non-native species. The HRA screening assessment adopted a strong precautionary principle; if a potential effect pathway is identified between the Project and a European site, then that site would be taken through to Appropriate Assessment (AA). This ensured all effects are captured, including *de minimis* effects.

The Stage 1 Screening assessment concluded that no LSEs would arise in relation to water quality, hydrological change, invasive non-native species and operational traffic emissions for any European sites, or any of the qualifying features of Thorne and Hatfield Moors SPA, Thorne Moor SAC and Hatfield Moor SAC.

LSEs could not be ruled out for certain qualifying features of the Humber Estuary SPA and Ramsar site through the loss of FLL, construction disturbance, operational barriers to movement and injury/mortality associated with overhead lines. Potential effects from construction dust deposition on qualifying habitats and supporting habitats of the Humber Estuary SAC, SPA and Ramsar site were also screened in for further assessment. As a result, these pathways were progressed to Stage 2: Appropriate Assessment.

The Stage 2 assessment considered the worst-case construction and operational scenarios, alongside embedded design measures and additional mitigation secured through the DCO. Key mitigation included sensitive route alignment, close paralleling with existing overhead lines, provision of approximately 46 hectares of replacement and enhanced foraging habitat for SPA/Ramsar qualifying features, controls on construction disturbance, and the installation of bird diverters on identified higher-risk spans of overhead line. The assessment also considered extensive ornithological survey data collected between 2022 and 2026, flight activity analysis, noise and air quality assessments and consultation with Natural England and various non-statutory conservation organisations.

Taking account of these measures, this HRA report concluded that the Project, (either alone or in combination with other plans and projects), would not result in an adverse effect on the integrity of the Humber Estuary SAC, Humber Estuary SPA, Humber Estuary Ramsar site, Thorne and Hatfield Moors SPA, Thorne Moor SAC or Hatfield Moor SAC. The conservation objectives of all relevant European and Ramsar sites would be maintained, and the Project would therefore be compliant with the requirements of the Habitats Regulations.

1. Introduction

1.1 Overview

1.1.1 National Grid Electricity Transmission plc (National Grid) owns and maintains the national high voltage electricity transmission network throughout England and Wales.

1.1.2 The transmission network connects the power from where it is generated to the regional distribution network operators who then supply businesses and homes.

1.1.3 National Grid holds the Transmission Licence for England and Wales, and its statutory duty is to develop and maintain an efficient, coordinated and economical system of electricity transmission and to facilitate competition in the generation and supply of electricity, as set out in the Electricity Act 1989 (HM Government, 1989).

1.1.4 National Grid has developed plans for the North Humber to High Marnham Project (the Project). The Project would support the UK government's net zero target through the connection of new, low carbon energy generation and by reinforcing the transmission network.

1.1.5 The Project would establish a new 400 kilovolt (kV) transmission connection approximately 90 kilometres (km) in length between a new substation to be built in the vicinity of Birkhill Wood, located to the north of Hull near Creyke Beck in the East Riding of Yorkshire, and a new substation at High Marnham in Nottinghamshire.

1.1.6 The reinforcement is needed because the existing transmission network, even with current upgrading, will not have sufficient capacity for the new renewable energy (a substantial proportion of which would be generated by offshore wind) that is expected to connect to the network over the next 10 years and beyond. Completion of the Project, together with other new reinforcements across the country, will meet this future energy transmission demand across the UK.

1.1.7 The Project is a Nationally Significant Infrastructure Project (NSIP), and National Grid is seeking development consent under the Planning Act 2008 (HM Government, 2008). NSIPs require a type of planning permission known as a Development Consent Order (DCO). Instead of applying to the local authority for planning permission, the developer must apply to the Secretary of State via the Planning Inspectorate for a DCO.

1.1.8 National Grid has submitted an application for development consent to the Planning Inspectorate for the Project. The Examining Authority (consisting of one or more examining inspectors), after a period of public examination, will make its recommendation to the Secretary of State for Energy Security and Net Zero, who in turn will decide on whether development consent should be granted.

1.1.9 The Project has been identified as being critical to delivering a network which supports the clean power pathways for 2030 delivery.

1.2 Purpose and Structure of the Document

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

1.2.2 As part of the HRA process for a development, it is necessary to consider whether the development is likely to have a 'significant' effect on areas that have been internationally designated for nature conservation purpose, i.e., 'European sites', comprising Special Areas of Conservation (SACs) and Special Protection Areas (SPAs), and Ramsar sites potentially affected by the Project. European sites and Ramsar sites are protected under The Conservation of Habitats and Species Regulations 2017 (HM Government, 2017), known as the 'Habitats Regulations'. The most recent amendments to the Habitats Regulations took place in 2019 (HM Government, 2019). following the UK leaving the European Union (EU). The Overarching National Policy Statement for Energy (EN-1) (Department for Energy Security and Net Zero, 2025) requires proposed SACs and SPAs to be treated as European sites.

1.2.3 The HRA process can have up to three stages; however, all stages may not need to be completed depending on the outcome of each step. Progression to and the need for each subsequent stage are dependent on the outcome of the preceding stage. The HRA process can be summarised as follows:

- Stage 1: Screening – to determine whether the proposal is likely to have a significant effect on the conservation objectives of a European site, alone or in combination with other plans and projects. If this can be excluded, it is not necessary to go through the Appropriate Assessment stage.
- Stage 2: Appropriate Assessment (AA) – to assess any potential for an adverse effect on the integrity of a European site, taking into account the manner in which it is proposed to be carried out or to any measures to avoid or minimise any such effects.
- Stage 3: Derogation – where an AA fails to rule out adverse effects on the integrity of a European site, permission for the proposal cannot be granted unless it can pass three legal tests and be granted an exception, known as a derogation. The three legal tests are:
  - Test 1: No Alternative Solutions – It must be proven that no feasible alternatives exist that would be less damaging or avoid damage to the site. This involves assessing alternative locations, methods, scales, or designs.
  - Test 2: Imperative Reasons of Overriding Public Interest (IROPI) – The proposal must be required for crucial public interest, typically relating to social or economic reasons, human health, public safety, or beneficial environmental consequences. The interest must be 'overriding', meaning it outweighs the damage to the site.
  - Test 3: Compensatory Measures Secured – Mandatory measures must be secured to ensure the overall coherence of the network of protected sites is maintained. These measures are designed to offset the harm caused by the Project.

1.2.4 The scope and extent of this HRA Report have been determined by ongoing engagement with consultees, including Natural England (NE) as the Statutory Nature Conservation Body (SNCB), the Royal Society for the Protection of Birds (RSPB) and professional judgement. Regard has also been given to the Planning Inspectorate's guidance on Nationally Significant Infrastructure Projects: Advice on Habitats Regulations Assessments (Planning Inspectorate, 2026).

1.2.5 This HRA Report is structured as follows:

- Section 1 Introduction;
- Section 2 Legislative Framework;
- Section 3 Assessment Methodology;
- Section 4 Data Gathering;
- Section 5 Establishing the Zones of Influence;
- Section 6 Relevant European Sites;
- Section 7 Potential Impact Pathways Scoping;
- Section 8 HRA Stage 1: Screening for Likely Significant Effects;
- Section 8.5 In-combination Assessment;
- Section 9 HRA Stage 2: Assessment to Inform Appropriate Assessment; and
- Section 9.4 Conclusion.

1.2.6 This HRA Report is supported by the following appendices:

- Appendix A – Location of Relevant European Sites in Relation to the Project;
- Appendix B – Table of European Sites and Impact Pathways;
- Appendix C – Citations/Natura 2000 Data Sheets for Relevant European Sites; and
- Appendix D – Conservation Objectives for European Sites Taken to Stage 2: Appropriate Assessment.
- Appendix E – LSE and AEoI Summaries

1.3 The Need Case

1.3.1 With growing renewables integration into the National Electricity Transmission System, such as offshore wind and interconnectors,[1] an anticipated tripling of wind generation connected across the Scottish networks by 2030 and the government's increased ambition to connect 50 GW of offshore wind by 2030, north–south power flows are set to increase.

1.3.2 The existing electricity transmission network in the Yorkshire and Humber region was initially developed in the 1960s and has historically been able to meet demand. It was designed to connect the inland large coal-fired power stations in the region, with changes occurring in the later parts of the century in order to connect gas fired power stations and offshore wind.

[1] Interconnectors are high voltage cables that are often used to connect the electricity systems of neighbouring countries.

1.3.3 However, due to the changes noted above in terms of delivering net zero emissions, the existing network in this area does not have the capability to reliably and securely transport all the energy that will be connected by 2030, whilst operating to the standards it is required to.

1.3.4 The existing transmission infrastructure in this area requires reinforcement for the following main reasons:

- The existing transmission network was not designed to transport electricity from where it is increasingly being generated (largely offshore).
- The growth in offshore wind, interconnectors and onshore generation, such as battery and solar, means that more electricity will be generated in the years ahead than the current network is able to securely and reliably transport.
- In the UK, electricity demand is forecasted to at least double by 2050, increasing the amount of energy we need to transport to homes and businesses.
- Upgrading the existing network as it is today (such as through replacing cables to carry more power) will not be enough to carry the amount of future power whilst operating to required standards.
- The need to increase boundary transfer capability in order to reduce wider network generator constraint costs.

1.3.5 The Project would support the UK's net zero target by reinforcing the electricity transmission network between the North of England and the Midlands, and facilitate the connection of planned renewable energy projects, such as offshore wind generation and interconnectors and increase boundary transfer capability. The Project would help meet future energy requirements.

1.3.6 For further information, please refer to the 'Needs Case' section contained within **Application Document 7.17 Strategic Options Report Including Needs Case**.

1.4 Project Description

1.4.1 The Project is a new 400 kilovolt (kV) electricity transmission connection of approximately 90 kilometres (km) in overall length between two proposed new substations: the 400 kV Birkhill Wood Substation and 400 kV High Marnham Substation.

1.4.2 The proposed new substations are subject to separate planning applications. For more information, see **Application Document 5.4 Consents and Licences Required Under Other Legislation**.

1.4.3 The Project comprises:

- Approximately 90 km of new overhead line (Route Code 4AF) between the proposed new 400 kV Birkhill Wood Substation and 400 kV High Marnham Substations;
- Replacement and realignment of a section of the existing 400 kV overhead line (Route Code 4ZQ) between Brantingham and east of Broomfleet;
- Replacement and realignment of a section of the existing 400 kV overhead line (Route Code ZDA) between Ealand and west of Keadby;
- Line entry connections to a proposed new 400 kV Birkhill Wood Substation;

- Line entry connections to a proposed new 400 kV High Marnham Substation; and
- The Project would include other required works, for example, temporary diversions for works on existing overhead line routes, temporary access roads, highway works, temporary works compounds, work sites and ancillary works. The Project would also include utility diversions and drainage works. There would also be land required for environmental mitigation, offsetting, compensation and Biodiversity Net Gain (BNG).

1.4.4 A full description of the Project is provided in **Application Document 6.4 Environmental Statement Chapter 4 Description of the Project**.

2. Legislative Framework

2.1 Introduction

2.1.1 The legal framework for the protection of European sites in England is set out in the Habitats Regulations (HM Government, 2017). Overarching National Policy Statement for Energy (EN-1) (Department for Energy Security and Net Zero, 2025) sets out advice on the HRA process for critical national priority infrastructure, such as the Project.

2.1.2 The term 'European site' is defined in the Habitats Regulations (HM Government, 2017) at Regulation 8 and refers to a Special Area of Conservation (SAC), a candidate Special Area of Conservation (cSAC), and a Special Protection Area (SPA). National Policy Statement EN-1 (Department for Energy Security and Net Zero, 2025) calls any site included within the Regulation 8 definition a 'European site', and this definition is also used within the National Planning Policy Framework (NPPF) (Ministry of Housing, Communities and Local Government, 2025).

2.1.3 As a matter of Government policy (Department for Energy Security & Net Zero, 2025), the following sites should be treated as if they are designated European sites:

- Potential Special Protection Areas (pSPAs) and possible Special Areas of Conservation (pSACs); and
- Areas identified or required to compensate for damage to a European site.

2.1.4 On 21 May 2026, the Habitats Regulations were amended by the Planning and Infrastructure Act 2025 (HM Government, 2025) to extend the legal protection afforded to European sites to Ramsar sites, which are sites designated under the Convention on Wetlands of International Importance especially as Waterfowl Habitat (the Ramsar Convention) (The Convention on Wetlands, 1975).

2.1.5 Where the term European site is used within this HRA Report, it includes Regulation 8 sites, Ramsar sites and those that Government policy advises should be treated as though they were Regulation 8 sites.

2.1.6 All plans and projects should identify any possible effects early in the plan/project process, and then either alter the plan/project to avoid them or introduce mitigation measures to the point where no adverse effects remain. In the context of the Habitats Regulations (HM Government, 2017), the Project constitutes a 'project'; therefore, no further reference to plans is made.

2.1.7 In coming to its conclusion, the Competent Authority must consult with the Statutory Nature Conservation Body (in this case, Natural England) and have regard to their comments. They may also consult the general public if considered appropriate.

2.2 Relevant Case Law

2.2.1 Although the UK is no longer part of the EU, a series of rulings of the Court of Justice of the European Union (CJEU) are still relevant to UK court decision making, as they form a body of useful jurisprudence. Relevant CJEU and UK High Court rulings and their implications for this HRA include those summarised in Table 2.1, and this HRA Report is cognisant of these rulings.

Table 2.1 – Case law relevant to the HRA of the Project

Case	Ruling	Relevance to HRA
People Over Wind and Sweetman v Coillte Teoranta (C-323/17) (European Union, 2018)	The ruling of the CJEU in this case requires that any conclusion of 'no likely significant effect' on a European site at the screening stage must be made prior to any consideration of measures to avoid or reduce harm to the European site. The determination of likely significant effects at the screening stage should not, in the opinion of the CJEU, constitute an attempt at detailed technical analyses. This should be conducted as part of the AA.	This ruling clarified that 'mitigation' (i.e., measures that are specifically introduced to avoid or reduce a harmful effect on a European site that would otherwise arise) should not be taken into account when forming a view on likely significant effects at the screening stage. Mitigation should instead only be considered at the AA stage. This HRA has been cognisant of that ruling.
Langton, R (on the Application of) v Secretary of State for Environment, Food and Rural Affairs & Anor. (CO/2062/2020) (European Union, 2018)	The High Court ruled that conditions on badger cull licences preventing badger culling near a SPA or at certain times of year should not be classed as mitigation measures, as described in the People over Wind ruling. The judge ruled that these licence conditions were properly characterised as "*integral features of the project*" and could therefore be relied on for the purposes of habitats screening. His reasoning was that it would be "*contrary to common sense for Natural England to assume that culling would take place at times and places where the applicants did not propose to do so*".	Restrictions on the timing of works which are part of the proponent's proposal can be taken into account in HRA Stage 1: Screening for Likely Significant Effects.
Waddenzee (C-127/02) (European Union, 2004)	The ruling of the CJEU in this case clarified that AA must be conducted using best scientific knowledge, and that the Competent Authority must be satisfied that there is no reasonable doubt as to the absence of adverse effects on the integrity of a European site.	Adopting the precautionary principle, a 'likely' significant effect in this HRA is interpreted as one which is 'possible' and cannot be objectively ruled out. The test of significance of effects has been conducted with reference to the conservation objectives of relevant European sites.

Case	Ruling	Relevance to HRA
	The Waddenzee ruling also provided clarity on the definition of 'significant effect', specifically that any effect from a plan or project which may undermine the conservation objectives must be treated as potentially significant.	
Holohan and Others v An Bord Pleanála (C-461/17) (European Union, 2018)	The conclusions of the CJEU in this case were that consideration must be given during the AA to: • Effects on qualifying habitats and/or species of a SAC or SPA, even when occurring outside of the boundary of a European site, if these are relevant to the site meeting its conservation objectives; and • Effects on non-qualifying habitats and/or species i.e., those that are not a reason for the European site designation on which the qualifying habitats and/or species depend, and which could result in adverse effects on the integrity of the European site.	This relates to the concept of 'functionally linked habitat[2] ' (i.e., areas outside of the boundary of a European site which support its qualifying feature(s)). In addition, consideration must be given to non-qualifying features upon which qualifying habitats and/or species rely. This HRA has taken the use of 'functionally linked habitat' into account in relation to birds and fish.
T.C Briels and Others v Minister van Infrastructuur en Milieu (C-521/12) (European Union, 2014)	The ruling of the CJEU in this case determined that compensatory measures cannot be used to support a conclusion of no adverse effect on site integrity.	Compensation can only be considered at the IROPI stage of HRA, if appropriate, and not during the AA. Compensation must be delivered when the AA concludes that there will be adverse effects on site integrity.
Sweetman and Others v An Bord Pleanála (C-258/11) (European Union, 2013)	The ruling of CJEU in this case determined that removal of whole or part of a certain priority habitat site amounting to its permanent destruction constituted an "adverse effect".	This case provided clarification on the construction of the phrase 'adverse effect on the integrity (AEOI)' of a European site, as designated under EU law.

[2] 'Habitat' here relates to both terrestrial and aquatic habitats. Terrestrial habitats relevant to this HRA use 'land'.

Case	Ruling	Relevance to HRA
C.G. Fry & Son Limited v Secretary of State for Levelling Up, Housing and Communities & Somerset Council (UKSC/2024/0108) (UK Supreme Court, 2024)	The Supreme Court found that in a multi-stage planning process, Regulation 63 can apply at the reserved matters or discharge of condition stage where the decision-maker has for any reason failed to carry out an AA at the stage of assessing whether to grant outline planning permission.	The protective purpose of the Habitats Regulations and the precautionary principle are promoted and respected in this HRA report, which considers all likely significant effects on European sites and Ramsar sites that could arise at any stage of the Project and demonstrates that there would be no adverse effects on the integrity of any such sites. It is not considered that any subsequent HRA would be required in connection with the discharge of requirements.

3. Assessment Methodology

3.1 Introduction

3.1.1 This HRA Report has been undertaken with reference to the general guidance on AA and the use of HRA published by the UK Government in July 2019 (Ministry of Housing, Communities and Local Government, 2019), the Planning Inspectorate's Nationally Significant Infrastructure Projects: Advice on Habitats Regulations Assessments (Planning Inspectorate, 2024, updated 2026), and the Overarching National Policy Statement for Energy (EN-1) (Department for Energy Security and Net Zero, 2025).

3.1.2 Whilst the HRA decision on the Project must be taken by the Competent Authority, the information needed to support this decision-making must be provided by National Grid. The information needed for the Competent Authority to establish whether there are any Likely Significant Effects (LSEs) or adverse effects on the integrity of European sites from the Project is therefore provided in this HRA Report.

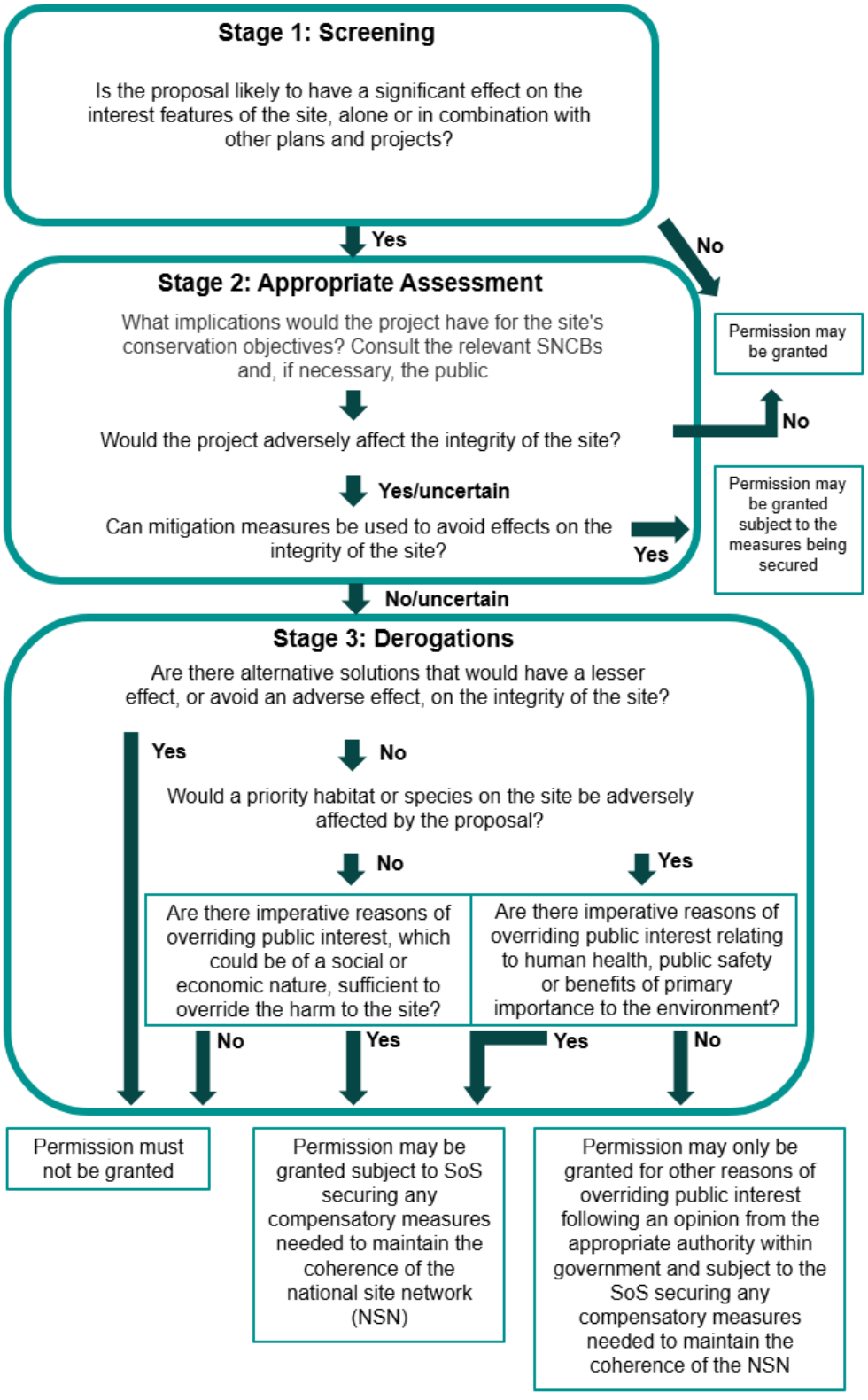
3.1.3 The Planning Inspectorate's advice on HRA (Planning Inspectorate, 2024, updated 2026) requires an evaluation of the potential for the Project to require other consents which may also require HRA by different competent authorities, and a statement to identify whether significant effects are considered likely regarding European sites in devolved administrations or European Economic Area (EEA) States. It is confirmed that the Order Limits do not overlap with areas of devolved administrations or with those of other EEA States. It is also the case that no parallel consents are required for the Project which would require additional HRA to be carried out, for example, a Marine Management Organisation (MMO) licence or Environment Agency (EA) Industrial Emissions Directive (IED) permit. The entirety of the Project is within England and there are no pathways arising from the Project that could result in LSE to European sites in devolved administrations or other EEA States.

3.1.4 All plans and projects should identify any possible effects early in the plan/project making process, and then either alter the plan/project to avoid them or introduce mitigation measures to the point where no adverse effects remain.

3.1.5 This HRA follows the established three-stage approach. Image 3.1 illustrates these stages, which guide the Competent Authority's decision-making on LSEs and potential impacts on site integrity.

3.1.6 Image 3.1 uses the term 'National Site Network' (NSN), which is the network of internationally important nature conservation sites that replaced the UK's membership of the Natura 2000 network following the UK's exit from the European Union. The NSN includes SACs and SPAs. The Habitats Regulations have been amended to extend legal protection to Ramsar sites, so the three-stage approach set out in Image 3.1 now applies to Ramsar sites.

Image 3.1 – Three stage approach to the HRA of proposed developments (Planning Inspectorate, 2026)



Terminology

3.1.7 In HRA, the term ‘qualifying feature’ is used. A qualifying feature is any habitat, species, or ecological interest for which a European site (SPA, SAC, or Ramsar site) has been designated.

3.2 HRA Stage 1: Screening for Likely Significant Effects

3.2.1 The purpose of the LSE test is to identify those aspects of a plan or project and impact pathways which can, on the basis of objective information and without the need for AA, be excluded as unlikely to give rise to likely significant effects on a European site. This is typically where there is no credible mechanism (i.e. no pathway) by which the plan or project could affect the site. Such aspects can therefore be screened out. The remaining aspects are taken forward to Stage 2: Appropriate Assessment. The HRA must also consider the potential for likely significant effects to arise in combination with other plans and projects.

3.2.2 Stage 1: Screening must be undertaken without consideration of mitigation measures that have been included for the purpose of minimising or avoiding likely significant adverse effects on a European site. Measures that form part of the Project design or that are not included for the purpose of avoiding or minimising risk to a European site can be considered at this stage.

3.2.3 This HRA Report has been prepared in accordance with all principles set out in relevant case law in Table 2.1, and guidance relating to HRA as listed in paragraph 3.1.1.

3.2.4 The Environmental Damage (Prevention and Remediation) (England) Regulations 2015 (HM Government, 2015) and The Environmental Permitting (England and Wales) Regulations 2016 (HM Government, 2016) make it an offence to pollute watercourses, irrespective of whether they are designated as European sites or not. Embedded construction and operation (and maintenance) phase management measures in relation to the water environment are contained within **Application Document 7.3 Register of Environmental Actions and Commitments**. Due to this legislation, these measures are integral features of the Project and can be considered at HRA Stage 1: Screening.

3.2.5 This HRA Report has taken the following staged approach to inform Stage 1: Screening:

- Establishing the Zone of Influence (ZoI) for the Project based on likely impact sources and likely impact pathways (see section 5);
- Identification of European sites within the ZoI (see section 6);
- Identification of potential impact pathways with the European sites within the ZoI (see section 7); and
- Stage 1: Screening for LSE for those European sites where a pathway exists (see section 8).

3.2.6 Those European sites where LSE cannot be ruled out are taken through to the Stage 2: Appropriate Assessment.

3.3 HRA Stage 2: Appropriate Assessment

3.3.1 If, at HRA Stage 1: Screening, the possibility of LSE on the qualifying features of any European site cannot be ruled out, then the second stage in the HRA process, AA, is required.

3.3.2 Appropriate Assessment considers in more detail the possibility that the impacts of a proposed development identified at HRA Stage 1: Screening could result in adverse effects on the integrity of the European sites, in view of the conservation objectives of those sites. Mitigation measures designed to avoid or reduce adverse effects on European sites can be taken into account in undertaking the AA.

3.3.3 The Stage 2: Appropriate Assessment is presented in section 9 of this HRA Report.

3.4 In-Combination Scope

3.4.1 It is a requirement of the Habitats Regulations (HM Government, 2017) that the impacts and effects of any proposed development being assessed are not only considered in isolation but also in combination with other plans and proposed developments that may also have effects on the European site(s) in question.

3.4.2 When undertaking this part of the assessment, it is essential to consider the principal intention behind the legislation, i.e., to ensure that those proposed developments or plans (which in themselves may have minor impacts) are not simply dismissed on that basis but are evaluated for any cumulative contribution they may make to an overall significant effect. In practice, in-combination assessment is therefore of greatest relevance when a proposed development would otherwise be screened out because its individual contribution is inconsequential.

3.4.3 This screening assessment adopts a strong precautionary principle; if a potential effect pathway is identified between the Project and a European site, then that site is taken through to AA. This ensures all effects are captured, including *de minimis* effects.

3.4.4 If significant effects cannot be ruled out on the basis of objective information, the proposal proceeds to Stage 2 - Appropriate Assessment. Where AA is required, the in-combination assessment examines whether the proposal, together with other plans and projects, would adversely affect the integrity of the European site in regard to any of its conservation objectives (HM Government, 2019).

3.4.5 The in-combination assessment is discussed further in section 10 of this report.

3.5 The Rochdale Envelope

3.5.1 Major infrastructure developments, such as linear infrastructure projects for overhead lines, typically require a degree of flexibility to be retained during detailed design and construction, in the event conditions are encountered which would otherwise prevent or delay construction. Examples can include discovering previously unknown archaeological assets or poor ground conditions at pylon locations. The Rochdale Envelope can also be used where parts of a proposed development are not confirmed at application stage and would be determined post-consent, including construction methods and timing.

3.5.2 To accommodate such issues, a flexible approach to design parameters can be adopted within the assessment process. This is referred to as the 'Rochdale Envelope'[3] approach, which allows a realistic worst-case assessment to be undertaken.

[3] The Rochdale Envelope arises from two cases: R. v Rochdale MBC ex parte Milne (No.1) and R. v Rochdale MBC ex parte Tew [1999], which are cases that dealt with outline planning applications for a proposed business park in Rochdale, UK.

3.5.3 The publication, Nationally Significant Infrastructure Projects: Pre-Application Advice on Environmental Impact Assessment (Planning Inspectorate, 2026), outlines how the Rochdale Envelope assessment approach may be applied in the context of the Planning Act 2008 (HM Government, 2008) process and suggests ways to address uncertainty whilst allowing sufficient flexibility in the DCO to enable delivery of a proposed development.

3.5.4 Notwithstanding the flexibility sought, all likely significant effects of a proposed development must be properly identified and assessed.

3.5.5 The Rochdale Envelope approach is underpinned by the following considerations:

- The assessment should use a cautious worst-case scenario approach and the mitigation measures proposed should adequately address the worst case;
- Information should be sufficient to enable the main, or the likely significant effects on the environment to be assessed and the mitigation measures should be described; and
- The need for flexibility should not be abused and does not give applicants an excuse to provide inadequate project descriptions.

3.5.6 This HRA Report has taken account of the flexibility proposed within the application for development consent (see **Application Document 6.5 Environmental Statement Chapter 5 EIA Approach and Methodology**) and worst-case construction and operational scenarios have been assessed in relation to each identified impact pathway and the potential for effects on relevant European sites.

4. Data Gathering

4.1 Sources of Data

4.1.1 In this HRA Report, the following sources of data have been used:

- Citations for European sites (Natural England, 2025) (Joint Nature Conservation Committee, 2025);
- Conservation Objectives, Site Improvement Plans, and Supplementary Advice on the Conservation Objectives for European sites (Natural England, 2025) (Joint Nature Conservation Committee, 2025);
- Guidance documents for specific impact pathways (referenced in the report where used);
- Ordnance Survey (OS) 1:25,000 maps;
- The Multi-Agency Geographic Information System (MAGIC) website (Department for Environment, Food and Rural Affairs, 2026); and
- Field survey data.

Surveys and Modelling

4.1.2 The HRA Report draws upon the following evidence obtained through field surveys undertaken for the Project. These are set out in Table 4.1 and Table 4.2, which show the additional assessments and modelling used to inform the HRA Report.

Table 4.1 – Summary of ecological field surveys relevant to this HRA

Ecological survey	Survey area/scope	Date
Vantage Point (VP) watches	Order Limits plus up to 2 km (location-specific).	November 2022 to January 2026
Diurnal field counts (River Ouse)	Field counts targeting qualifying features of the Humber Estuary SPA and Priority Species within broad areas either side of the River Ouse to accommodate early Project design.	January 2023 to January 2024
Diurnal field counts of FLL	Minimum 500 m either side of Order Limits across Humberhead Levels between Ellerker and Keadby; and Yorkshire Wolds between Brantingham and Skidby.	October 2023 to April 2024 October 2024 to April 2025
Nocturnal field counts of FLL	Minimum 500 m either side of Order Limits across Humberhead Levels between Ellerker and Luddington.	October 2024 to April 2025

Ecological survey	Survey area/scope	Date
Through the Tide Counts, continuing as High and Low tide counts from April 2023	River Ouse crossing point and minimum 500 m either side of the crossing point.	June 2022 to March 2023
High and Low Tide Counts (River Ouse)	River Ouse and adjacent terrestrial habitats up to a minimum of 500 m either side of the crossing point.	April 2023 to July 2025
High Tide Counts (Broomfleet Tileworks)	Broomfleet Tileworks.	October 2024 to January 2026; April to August 2026
Foraging nightjar (*Caprimulgus europaeus*) surveys	Suitable habitat that overlaps Order Limits within foraging range of this species.	June to July 2022 Repeated June to July 2024

Table 4.2 – Summary of assessments/modelling relevant to this HRA

Assessment/Modelling	Survey area/scope
Transport assessment	Primary Access Routes (PARs) and associated highway links that connect the Site and construction access points to the Strategic Road Network (SRN) and Main Road Network (MRN).
Air quality – vehicle emissions	Within 200 m of the construction traffic routes.
Construction dust assessment	250 m from the Order Limits for human and ecological receptors; and 50 m from the route(s) used by construction vehicles on the public highway, and up to 250 m from the proposed bellmouths for human and ecological receptors.
Noise and vibration	Construction noise effects – noise and vibration sensitive receptors (NSR) within 300 m from the construction works.
	Construction vibration effects – 100 m from the closest construction activity with the potential to generate vibration impacts at NSR.
	Construction traffic noise – noise generated by construction traffic on the existing road network has been assessed for each applicable road.
	Operational noise – includes NSR within 1 km of the line (and associated Limits of Deviation).

4.1.3 Further information on the ornithological surveys is provided in Table 3.2 of **Application Document 6.9.A2 Environmental Statement Appendix 9.2 Ornithology Baseline Report**.

4.1.4 Further information on the Phase 1 habitat survey is provided in **Application Document 6.8.A3 Environmental Statement Appendix 8.3 Habitat Survey Report**.

4.1.5 Further information on the traffic assessment is provided in **Application Document 7.15 Transport Assessment**.

4.1.6 Further information regarding air quality is provided in **Application Document 6.15 Environmental Statement Chapter 15 Air Quality** and **Application Document 6.15.A2 Environmental Statement Appendix 15.2 Construction Dust Methodology and Assessment**.

4.1.7 Further information regarding noise and vibration is provided in the following documents:

- **Application Document 6.16 Environmental Statement Chapter 16 Noise and Vibration**;
- **Application Document 6.16.A2 Environmental Statement Appendix 16.2 Baseline Noise Survey Data**;
- **Application Document 6.16.A3 Environmental Statement Appendix 16.3 Construction Noise and Vibration Data**;
- **Application Document 6.16.A4 Environmental Statement Appendix 16.4 Construction Traffic Noise and Vibration Assessment**; and
- **Application Document 6.16.A5 Environmental Statement Appendix 16.5 Operational Overhead Line Noise Assessment**.

4.2 Consultation with Natural England

4.2.1 As required by Planning Inspectorate's guidance document Nationally Significant Infrastructure Projects: Advice on Habitats Regulations Assessments (Planning Inspectorate, 2024, updated 2026) and good practice, the HRA and its emerging findings have been shared with Natural England on a regular basis during the development of the Project. This has been through a combination of meetings and document sharing. Comments received and how they have been addressed are set out in **Application Document 5.1 Consultation Report** and **Application Document 6.9 Environmental Statement Chapter 9 Ornithology**.

5. Establishing the Zones of Influence

5.1 Approach

5.1.1 There is no defined guidance on the spatial scope of a HRA. When seeking to identify relevant European sites and therefore the relevant ZoI, consideration was primarily given to potential impact pathways and the source-pathway-receptor approach, rather than adopting a purely 'zones'-based approach.

5.1.2 The source-pathway-receptor model is a standard tool in environmental assessment and applied to the receptors assessed. In order for an impact to occur, all three elements of this mechanism must be in place. The absence or removal of one of the elements of the mechanism means there is no possibility for an effect to occur. Furthermore, even where an impact is predicted to occur, it may not result in significant effects. It is also important to distinguish between an 'impact' and an 'effect': an impact is defined as an action resulting in changes to an ecological feature, while an effect is the outcome to an ecological feature arising from an impact (Chartered Institute of Ecology and Environmental Management, 2024). For example, an impact may be the disturbance of a roost of wintering waders as a result of construction activities; the effect would be how the population or conservation status of the species disturbed by the works changes as a consequence.

5.1.3 The likely zone of impact (also referred to as the likely ZoI) of a proposed development is the geographic extent over which ecological impacts are likely to occur. The ZoI of a proposed development will vary depending on the specifics of a particular proposed development and must be determined on a case-by-case basis, with reference to a variety of criteria, including:

- The nature, size/scale and location of the proposed development;
- The connectivity between the proposed development and European sites, for example through hydrological connections or because of the natural movement of qualifying features;
- The sensitivity of ecological features under consideration; and
- The potential for in-combination effects.

5.1.4 There is no geographical limit beyond which European sites need not be considered by the HRA of a proposed development.

5.1.5 In establishing the ZoI for the Project, the following stepped approach has been used:

- Identification of the potential sources of impact from the construction, operation and maintenance of the Project;
- Identification of potential impact pathways between the source of potential impact and qualifying features of European sites; and
- Combination of the potential sources of impact and potential impact pathways to define the ZoI.

Potential Sources of Impact

5.1.6 A number of potential impacts could arise from the construction, maintenance and operation of the Project; these are listed in Table 5.1 .

Potential Impact Pathways

5.1.7 Impact pathways are routes by which the implementation of a proposed development can lead to an effect on a European site. In order for an impact to have an effect on a qualifying feature of a European site, a pathway between the impact source and that feature must exist. An example of this would be visual and noise/vibration disturbance arising from the construction work or operational phase associated with a proposed development. If there are sensitive ecological receptors within a nearby European site (e.g., non-breeding overwintering birds), this could alter their foraging and roosting behaviour and potentially affect the site's integrity. For some impact pathways (notably air pollution) there is guidance that sets out the proposed ZoI required for assessment. These are discussed below where relevant.

Zones of Influence

5.1.8 The adopted ZoIs are set out in Table 5.1. The ZoI at which an effect could occur has been determined based on the pathway(s) by which such impact(s) could reach a European site or its qualifying feature(s). The ZoIs are based on published guidance or best available research, wherever possible. Where published guidance or research is not available, a professional judgment has been made based on the best available evidence.

Table 5.1 – Adopted Zones of Influences

Potential sources of impact	Potential impact pathway	Adopted ZoI
Direct loss of/damage to qualifying habitat	The direct loss of habitat from within the boundary of a European site. This may include the loss of a habitat type, which is itself a qualifying feature of a site, or the loss of habitat that is used by qualifying features for commuting, foraging, and/or sheltering, which would pose implications for the site conservation objectives.	Within European site boundary.
Loss of functionally linked land (FLL)	The loss of habitat which is outside of the boundary of a European site, but which is critical to its functioning. For example, the loss of habitat outside of an SPA which is used for foraging purposes by qualifying bird species which nest within the SPA.	Dependent on the species in question. In the absence of direct, published guidance from NE, NatureScot's (formerly Scottish Natural Heritage [SNH]) guidance on 'Assessing Connectivity with Special Protection Areas (SPAs)' (Scottish Natural Heritage, 2016) suggests that certain species of geese may forage up to 15–20 km from the boundary of SPAs, for which they are qualifying features. This is likely to be the largest distance at which functionally linked habitat may be located from a European site. In some cases, they can forage further than this; however, more generally, functionally linked habitat is likely to be within a maximum of 10 km distance from a European site boundary for most species (though often it is considerably less than this). While acknowledging this likely core range, there can be site-specific exceptions. Knowing that the pink-footed geese range widely across the Humber Estuary and its hinterland, as a precautionary measure, a ZoI of 20 km has been used to incorporate SPAs supporting species with large foraging ranges (e.g., pink-footed goose (*Anser brachyrhynchus*)) than for other sites.

Potential sources of impact	Potential impact pathway	Adopted ZoI
Water quality	The introduction of, for example, suspended sediment or runoff of water containing other pollutants, such as hydrocarbons or chemicals into waterbodies within, or that are hydrologically linked to, European sites.	No set ZoI has been used – this relies on there being a hydrological connection to a European site, according to the source-pathway-receptor model.
Airborne pollution	The introduction of both dust (i.e., particles of sufficiently large size to coat vegetation and interfere with photosynthesis) and atmospheric pollutants that can be toxic to vegetation or contribute to nitrogen deposition and thus eutrophication to European sites, or habitats that support qualifying features of European sites. The latter mainly constitutes oxides of nitrogen (NO_x) associated with combustion (such as vehicle exhausts), and ammonia (NH_3) associated particularly with industrial processes and agriculture but also with vehicle exhaust emissions.	The ZoI for dust is based on the Institute of Air Quality Management (IAQM) Construction Dust guidance (Institute of Air Quality Management, 2024). Following Natural England's feedback raised at statutory consultation about the ZoI being smaller for ecological receptors than for human receptors, the ZoI for ecological areas has been amended so that it is the same as for human receptors and is as follows: • 250 m from the Order Limits for human and ecological receptors; and • 50 m from the route(s) used by construction vehicles on the public highway up to 250 m from the proposed bellmouths for human and ecological receptors. The ZoI for the assessment of construction vehicle emissions is an area within 200 m of the construction traffic routes, which exceeds the Institute of IAQM and European Protection UK (EPUK) Development Control screening criteria (Institute of Air Quality Management (IAQM) & Environmental Protection UK, 2017).
Hydrological changes	Impacts which alter the hydrological conditions either within a European site or in an area used by the qualifying features of a European site. For example, reduced flows in a watercourse due to impoundment,	No set ZoI has been used – this relies on there being a hydrological connection to a European site, according to the source-pathway-receptor model.

Potential sources of impact	Potential impact pathway	Adopted ZoI
	or changes to groundwater flows or volumes due to abstraction. These changes can have multiple effects on habitats and species.	
Disturbance of qualifying features	The introduction of physical disturbance, for example, due to the movement of vehicles in proximity to a European site or qualifying features using land functionally linked to a European site, or due to noise and/or vibration. The latter may occur at greater distances.	Based on the published guidance referenced below, the following ZoIs have been used when considering how far sources of disturbance could propagate, and which may disturb qualifying features: • Non-breeding waterbirds – the Waterbird Disturbance Mitigation Toolkit (Cutts, N., Hemingway, K & Spencer, J., 2013) provides species-specific information on the sensitivity of several bird species which are qualifying features of SPAs. However, it suggests that, in general, disturbance of non-breeding waterbirds can occur up to distances of up to 500 m from construction works, although this may extend up to 800 m for certain species (Goodship, N.M. & Furness, R.W. (MacArthur Green), 2022). • Breeding birds – 1 km, this being the maximum distance at which Goodship and Furness (2022) (Goodship, N.M. & Furness, R.W. (MacArthur Green), 2022) consider that disturbance could occur on the most sensitive species for which SPAs are designated. • Marine mammals, including grey seal (*Halichoerus grypus*), harbour seal (*Phoca vitulina*) and harbour porpoise (*Phocoena phocoena*) can range over very large distances. For example, a search distance of 135 km from SACs designated for grey seal was used in the HRA of National Planning Framework 4 (NPF4) (AECOM, 2022), and a distance of 50 km for harbour porpoise and harbour seal and have been adopted for this HRA. • Bats – a 30 km ZoI has been applied in accordance with the Design Manual for Roads and Bridges LA 115 Habitats Regulations Assessment guidance (Highways England, 2020).
Barriers to movement	Barriers to the movement of qualifying features of European	No set ZoI has been used.

Potential sources of impact	Potential impact pathway	Adopted ZoI
	sites, which can either be physical (for example, a dam in a river) or physiological (for example, the attraction of migratory fish towards the outflow of a hydro-electric scheme).	There is the potential for the Project to prevent the regular movements (including migration) of qualifying features including fish. The ZoI for this impact was based on any SAC designated for fish species for which a direct hydrological connection to the Project exists. The ZoI for SPAs has been based on connectivity between SPAs and their respective areas of FLL.
Injury or mortality	The direct injury or mortality of a qualifying features of a European site. For example, birds may suffer injury or mortality should they collide with the proposed overhead lines.	Injury or mortality of qualifying features could occur where works are proposed within a European site boundary, and also as a result of qualifying features moving between roosts or breeding locations and, as they do so, interacting with the Project. Therefore, the same ZoI for 'direct loss of habitat' and 'loss of functionally linked land' has been applied.
Spread of invasive non-native species (INNS)	Invasive non-native species can have detrimental impacts on native species and habitats. Their spread can occur during construction and operation of a development, and via multiple pathways (for example, via watercourses or on the treads of construction machinery).	A ZoI of 50 m has been applied, except where hydrological connectivity could result in spread further afield.

6. Relevant European sites

6.1 Introduction

6.1.1 To identify which European sites should be scoped into the HRA Stage 1: Screening, the ZoIs set out in Table 5.1 and professional judgment have been used to determine whether there is any potential pathway connecting the Project to any European sites. All European sites within the following ZoIs have been identified:

- A 10 km ZoI has been used for SACs and pSACs (other than where they are designated for bats, cetaceans and grey seal).
- A 20 km ZoI has been used for SPAs, pSPAs and Ramsar sites designated for species with large core foraging ranges.
- A 30 km ZoI was used to identify any European sites for which bats are a qualifying feature. It can be confirmed that there are no European sites designated for bats within 30 km of the Project.
- A 50 km ZoI was also used to identify any European sites designated for cetaceans and harbour seal. It can be confirmed that there are no SACs designated for harbour porpoise and harbour seal within 50 km of the Project.
- A 135 km ZoI was used for any European sites designated for grey seal.

6.1.2 All relevant European sites were identified using Geographic Information System data from datasets downloaded from the Joint Nature Conservation Committee (JNCC) (Joint Nature Conservation Committee, 2025) and the MAGIC website (Department for Environment, Food and Rural Affairs, 2026).

6.1.3 The European sites within the ZoIs and that are considered relevant to the Project are set out below, and are shown in Figure A.1, located in Appendix A of this report.

6.1.4 The conservation objectives have been obtained for each of the European sites taken through to Stage 2: Appropriate Assessment. This information is available at Conservation Objectives for European Sites Taken to Stage 2: Appropriate AssessmentConservation Objectives for European Sites Taken to the Stage 2: Appropriate Assessment. Information has also been sought to understand the potential vulnerability of the qualifying features to any effects that might arise from the Project. This information is available in Appendix C Citations/Natura 2000 Data Sheets for Relevant European sites.

Humber Estuary SAC (UK0030170) – Within the Order Limits

6.1.5 The site is designated as a SAC for the following reasons (JNCC, 2007):

- Annex I habitats listed under article 4(4) of the Habitats Directive 1992 (Council of the European Communities, 1992) that are a primary reason for selection of this site:
  - Estuaries; and
  - Mudflats and sandflats not covered by seawater at low tide.

- Annex I habitats present as a qualifying feature, but not a primary reason for selection of this site (Annex I priority habitats are denoted by an asterisk (*)):
  - Sandbanks which are slightly covered by sea water all the time;
  - Coastal lagoons*;
  - *Salicornia* and other annuals colonising mud and sand;
  - Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*);
  - Embryonic shifting dunes;
  - Shifting dunes along the shoreline with *Ammophila arenaria* (‘white dunes’);
  - Fixed coastal dunes with herbaceous vegetation (‘grey dunes’)*; and
  - Dunes with *Hippophae rhamnoides*.
- Annex II species listed under article 4(4) of the Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora Directive 1992 (Council of the European Communities, 1992), hereafter referred to as the ‘Habitats Directive', present as a qualifying feature, but not a primary reason for site selection:
  - Sea lamprey (*Petromyzon marinus*);
  - River lamprey (*Lampetra fluviatilis*); and
  - Grey seal (*Halichoerus grypus*).

Humber Estuary SPA (UK9006111) – Within the Order Limits

6.1.6 The site qualifies as an SPA (Natural England, 2007) under article 4.1 of the Directive 2009/147/EC of the European Parliament and of the Council of 30 November 2009 on the conservation of wild birds (Codified version) (The European Parliament & the Council of the European Union, 2009), hereafter referred to as the ‘Birds Directive’, as it is used regularly by one percent or more of the Great Britain populations of the following species (listed in Annex I) in any season:

- Avocet (*Recurvirostra avosetta*) – wintering and breeding;
- Bittern (*Botaurus stellaris*) – wintering and breeding;
- Hen harrier (*Circus cyaneus*) – wintering;
- Golden plover (*Pluvialis apricaria*) – wintering;
- Bar-tailed godwit (*Limosa lapponica*) – wintering;
- Ruff (*Philomachus pugnax*[4]) – passage;
- Marsh harrier (*Circus aeruginosus*) – breeding; and
- Little tern (*Sterna albifrons*[5]) – breeding.

[4] This has subsequently been updated to *Calidris pugnax*.

[5] This has subsequently been updated to *Sternula albifrons*.

6.1.7 The site qualifies as an SPA (Natural England, 2007) under article 4.2 of the Birds Directive (The European Parliament & the Council of the European Union, 2009), as it is used regularly by one percent or more of the biogeographical populations of the following regularly occurring migratory species (other than those listed in Annex I) in any season:

- Shelduck (*Tadorna tadorna*) – wintering;
- Knot (*Calidris canutus*) – wintering and passage;
- Dunlin (*Calidris alpina*) – wintering and passage;
- Black-tailed godwit (*Limosa limosa*) – wintering and passage; and
- Redshank (*Tringa totanus*) – wintering and passage.

6.1.8 The site qualifies as an SPA under article 4.2 of the Birds Directive (The European Parliament & the Council of the European Union, 2009) as it is used regularly by over 20,000 waterbirds (waterbirds as defined by the Ramsar Convention) in any season:

- Assemblage qualification:
  - In the non-breeding season, the area regularly supports 153,934 individual waterbirds, including dark-bellied brent goose (*Branta bernicla bernicla*), shelduck, wigeon (*Anas penelope*), teal (*Anas crecca*), mallard (*Anas platyrhynchos*), pochard (*Aythya ferina*), scaup (*Aythya marila*), goldeneye (*Bucephala clangula*), bittern, oystercatcher (*Haematopus ostralegus*), avocet, ringed plover (*Charadrius hiaticula*), golden plover (*Pluvialis apricaria*), grey plover (*P. squatarola*), lapwing (*Vanellus vanellus*), knot, sanderling (*Calidris alba*), dunlin, ruff, black-tailed godwit, bar-tailed godwit (*Limosa lapponica*), whimbrel (*Numenius phaeopus*), curlew (*N. arquata*), redshank, greenshank (*Tringa nebularia*) and turnstone (*Arenaria interpres*).

6.1.9 During pre-application consultations, Natural England recommended that the Applicant should focus on what are referred to as the 'main component species' of the assemblage (Natural England, 2024). The assemblage qualification is therefore subject to change as species' populations change. It should be noted that species listed on the citation under the assemblage features, whose populations have fallen to less than one percent of the national population, retain their status as a main component species, and should be considered when assessing the impacts of a proposed development or plan on the Humber Estuary SPA.

6.1.10 Natural England advises that the main component species of the Humber Estuary SPA non-breeding waterbird assemblage include:

- Species listed individually under the assemblage feature on the SPA citation (Natural England, 2007):
  - Avocet (non-breeding);
  - Bar-tailed godwit (non-breeding);
  - Bittern (non-breeding);

- **Black-tailed godwit**[6] (non-breeding);
- **Brent goose** (non-breeding);
- **Curlew** (non-breeding);
- **Dunlin** (non-breeding);
- **Golden plover** (non-breeding);
- Goldeneye (non-breeding);
- Greenshank (non-breeding);
- Grey plover (non-breeding);
- Knot (non-breeding);
- **Lapwing** (non-breeding);
- **Mallard** (non-breeding);
- Oystercatcher (non-breeding);
- Pochard (non-breeding);
- **Redshank** (non-breeding);
- Ringed plover (non-breeding);
- **Ruff** (non-breeding);
- Sanderling (non-breeding);
- Scaup (non-breeding);
- **Shelduck** (non-breeding);
- **Teal** (non-breeding);
- Turnstone (non-breeding);
- **Whimbrel** (non-breeding); and
- Wigeon (non-breeding).

- Species which are not listed on the SPA citation (Natural England, 2007) but occur at site levels of more than one percent of the national population, according to the most recent Humber Estuary Wetland Bird Survey (WeBS) 5-year average count:
  - Green sandpiper (*Tringa ochropus*) – non-breeding;
  - **Greylag goose** (*Anser anser*) – non-breeding;
  - **Little egret** (*Egretta garzetta*) – non-breeding;
  - **Pink-footed goose** (*Anser brachyrhynchus*) – non-breeding;
  - Shoveler (*Anas clypeata*) – non-breeding; and
  - **Crane** (*Grus grus*) – non-breeding.

[6] The species marked **in bold text** are known to use off-site supporting habitat/FLL (e.g., arable farmland, grassland/pasture, and/or non-estuarine waterbodies) in the non-breeding season and may therefore be the most relevant for assessing potential impacts of a proposed development on birds using FLL associated with the Humber Estuary SPA.

6.1.11 Some species, such as **snipe** (*Gallinago gallinago*), **Jack snipe** (*Lymnocryptes minimus*) and water rail (*Rallus aquaticus*) have known undercounts in the WeBS data. Therefore, high counts of these species should also be considered.

6.1.12 Natural England also specifies the need to consider potential impacts on species which are not considered to be non-breeding waterbirds but are listed on the citation qualifying under article 4.1 and 4.2 of the Birds Directive (The European Parliament & the Council of the European Union, 2009). These include:

- **Hen harrier** – non-breeding;
- **Marsh harrier** – breeding; and
- Little tern – breeding.

6.1.13 In Annex B: Humber Estuary Special Protection Area: non-breeding waterbird assemblage (Version 2), Natural England (Natural England, 2024) also state:

'[…] *this list should be used as a guide only; usage may depend on factors such as the habitats available on the site and distance to the Humber Estuary etc. Therefore, assessments of potential impacts on birds using functionally linked land should consider all relevant species and clear justification should be provided if any species are excluded from the assessment'.*

Humber Estuary Ramsar site (UK11031) – Within the Order Limits

6.1.14 The site qualifies as a Ramsar site for the following reasons (JNCC, 2007):

- Ramsar criterion 1 – The site is a representative example of a near-natural estuary with the following component habitats: dune systems and humid dune slacks; estuarine waters; intertidal mud and sand flats; saltmarshes; and coastal brackish/saline lagoons.
- Ramsar criterion 3 – The Humber Estuary Ramsar site supports a breeding colony of grey seals at Donna Nook. It is the second largest grey seal colony in England, and the furthest south regular breeding site on the east coast. The dune slacks at Saltfleetby-Theddlethorpe on the southern extremity of the Ramsar site are the most north-easterly breeding site in Great Britain of the natterjack toad (*Bufo calamita*[7]).
- Ramsar criterion 5 – Assemblages of international importance: 153,934 waterfowl, non-breeding season.
- Ramsar criterion 6 – Species/populations occurring at levels of international importance:
  - Golden plover – passage and wintering;
  - Knot – passage and wintering;
  - Dunlin – passage and wintering;
  - Black-tailed godwit – passage and wintering;
  - Redshank – passage and wintering;
  - Shelduck – wintering; and

[7] This has subsequently been updated to *Epidalea calamita*.

- Bar-tailed godwit – wintering.

- Ramsar criterion 8 – The Humber Estuary acts as an important migration route for both river lamprey and sea lamprey between coastal waters and their spawning areas.

Thorne and Hatfield Moors SPA (UK9005171) – 2.70 km West of the Order Limits

6.1.15 The site qualifies as an SPA (Natural England, 2011) under article 4.1 of the Birds Directive (The European Parliament & the Council of the European Union, 2009), as it is used regularly by one percent or more of the Great Britain population of a species listed in Annex 1 in any season: Nightjar – breeding.

Thorne Moor SAC (UK0012915) – 2.70 km West of the Order Limits

6.1.16 The site is designated as a SAC for the following reasons (JNCC, 2015) – Annex I habitats that are a primary reason for selection of this site: Degraded raised bogs still capable of natural regeneration.

Hatfield Moor SAC (UK0030166) – 5.73 km West of the Order Limits

6.1.17 The site is designated as a SAC for the following reasons (JNCC, 2015) – Annex I habitats that are a primary reason for selection of this site: Degraded raised bogs still capable of natural regeneration.

Sites Considered and Scoped Out within the ZoI

6.1.18 The Lower Derwent Valley SPA/Ramsar site is primarily designated for Bewick's swan (*Cygnus columbianus*), golden plover, ruff, wigeon and teal. The site lies 13.59 km from the Project, which is outside the foraging ranges of the qualifying mobile species (Scottish Natural Heritage, 2016). As such, this European site has been scoped out from further assessment.

6.1.19 Hornsea Mere SPA is located 17 km from the Project and designated for a nationally important post breeding and moulting population of mute swan (*Cygnus olor*) (Natural England, 2014). However, as the core foraging range for wintering swans is less than 5 km (Scottish Natural Heritage, 2016), this European site has been scoped out from further assessment.

6.1.20 The Greater Wash SPA lies 22 km from the Project. The SPA is designated for non-breeding red-throated diver (*Gavia stellata*), which winters in coastal waters; little gull (*Hydrocoloeus minutus*), which also favour marine and intertidal habitats; and breeding sandwich tern (*Sterna sandvicensis*), common tern (*Sterna hirundo*) and little tern (*Sterna albifrons*) (Natural England, 2018), all of which are primarily offshore feeders. This European site has therefore been scoped out from further assessment.

7. Potential Impact Pathways Scoping

7.1 Introduction

7.1.1 This section sets out the potential impact pathways with the European sites listed in section 6. Table B.1 at Appendix B of this HRA Report presents the impact pathways assessment for each European site, as required by the Planning Inspectorate's Nationally Significant Infrastructure Projects: Advice on Habitats Regulations Assessments (Planning Inspectorate, 2024, updated 2026).

7.2 Direct Loss of/Damage to Qualifying Habitat

7.2.1 The purpose of the Habitats Regulations (HM Government, 2017) is to protect England's European sites, including some of the country's most important habitats and species.

7.2.2 Generally, the temporary (or permanent) loss of designated habitat must be avoided or mitigated, provided that the habitat in question is itself a designated feature or critical for the European site to meet its conservation objectives. However, temporary habitat loss within designated site boundaries is permissible where this solely encompasses habitat that is part of the 'site fabric' (Department for Environment, Food and Rural Affairs, 2012).

7.2.3 Any permanent, irreversible, habitat loss from a European site that involves the loss of qualifying features will be adverse, although to affect the integrity of the SAC (the coherence of its structure and function), the loss must be sufficient to materially impair the achievement of the European site's conservation objectives.

7.2.4 Various developments can result in the loss of habitat in European sites, either temporarily or permanently. Temporary habitat loss (e.g., such as that potentially resulting from usage of temporary access tracks and vegetation clearance for visibility splays) is typically reversible. Furthermore, there is the potential for deploying mitigation measures to avoid adverse effects on site integrity. In contrast, the permanent loss of designated habitat will result in a reduction of coverage of a potentially very rare ecosystem, with potential knock-on impacts on dependent qualifying features.

European sites scoped in for this impact pathway

7.2.5 No European sites have been scoped in for this impact pathway.

European sites scoped out for this impact pathway

7.2.6 This impact pathway is scoped out for all European sites for the following reasons:

- This impact pathway is scoped out for Humber Estuary SAC/SPA/Ramsar site. Temporary working areas are adjacent to these European sites (2 m away at the closest point), and pilot bonds and conductors will be pulled off the ground whilst oversailing the Humber Estuary SAC/SPA/Ramsar site. There are no physical works within the European sites boundary on any qualifying habitat. Further

construction methodology information is available in **Application Document 6.4 Environmental Statement Chapter 4 Description of Project**.

- This impact pathway is scoped out for Thorne Moor SAC, Hatfield Moor SAC and Thorne and Hatfield Moors SPA on the basis of the distances of these European sites from the Project, and/or being designated for mobile features.

7.3 Loss of Functionally Linked Land

7.3.1 While most European sites have been geographically defined to encompass the key features that are necessary for coherence of their structure and function, and the support of their qualifying features, this is not always the case. In many cases qualifying features – which can include birds, fish, mammals and amphibians - can move between habitats within and outside the designated site boundary. The assessments presented herein take into account the potential use of habitats by any qualifying features outside the boundaries of the European sites, which in this case only relate to mobile bird qualifying features.

7.3.2 Due to the highly mobile nature of some qualifying features, for example, geese, it is inevitable that areas of habitat of crucial importance to the maintenance of their populations are outside the physical limits of the European site for which they are an interest feature. These areas (FLL) are still essential for maintenance of the structure and function of the interest feature for which the European site was designated, and land use plans that may affect this land should still therefore be subject to further assessment (The Court of Justice of the European Union (CJEU), Second Chamber, 2018).

7.3.3 With regard to birds, areas of FLL typically provide habitat for foraging or other ecological functions essential for the maintenance of the designated population (e.g., high tide roosts for coastal populations).

7.3.4 Natural England has published guidance on Sites of Special Scientific Interest (SSSI) Impact Risk Zones (IRZs) (Knight, M., 2019) associated with different types of development on various functional groups of birds[8]. Sites of Special Scientific Interest provide legal protection to SPAs through their designation as SSSIs under Wildlife and Countryside Act 1981 ((HM Government, 1981).

7.3.5 These IRZs provide a high-level screening tool for assessing the risk of planning applications affecting important habitats outside European site boundaries. The guidance identifies that functionally linked habitats may extend up to the maximum foraging distances from roost locations, although it also notes that the proportion of designated foraging birds will decrease with distance from the European site. Importantly, the IRZ guidance note (Knight, M., 2019) does not define the required abundance threshold needed to meet the criterion of functional habitat linkage.

7.3.6 NatureScot has also published guidance on the distances up to which qualifying features may use FLL outside of European sites (Scottish Natural Heritage, 2016). Accordingly, SPAs up to 20 km were searched for, as this is given as the largest foraging range for qualifying features non-breeding pink-footed goose and greylag goose).

[8] A functional group of birds is a collection of different bird species that share a similar ecological role, diet, or behaviour in nature, rather than being closely related by family or evolutionary history

7.3.7 The information presented in Table 7.1 combines information presented in the IRZ SSSI guidance (Knight, M., 2019), NatureScot guidance (Scottish Natural Heritage, 2016) and species-specific reports.

Table 7.1 – Impact Risk Zones for functional groups of birds

Assemblage	Impact Risk Zone (foraging distance)
Wintering birds (except wintering waders and grazing wildfowl; and wigeon and geese)	Up to 500 m.
Dabbling ducks such as teal, mallard and gadwall (*Mareca strepera)* (formerly *Anas strepera*)	Home ranges could extend beyond site boundaries at coastal sites but less likely to do so at inland water bodies.
Wintering waders (except golden plover and lapwing), brent goose and wigeon	Generally, the maximum foraging distance is 500 m, although curlew can forage up to 3.5 km (British Trust for Ornithology, 2022).
Breeding heathland species, including nightjar and stone curlew (*Burhinus oedicnemus*)	Radiotracking studies have shown that nightjar can forage up to 5 km from breeding grounds (Natural England, 2014).
Wintering lapwing and golden plover	Typical wintering foraging range of 1-5 km from roost sites. (British Trust for Ornithology, 1999). Developments affecting FLL more than 10 km from the site are unlikely to impact notably on designated populations.
Wintering white-fronted goose (*Anser albifrons),* greylag goose, Bewick's swan, whooper swan (*Cygnus cygnus*), pink-footed goose and wintering bean goose (*Anser fabalis*)	Maximum foraging distance is 10 km, although studies have shown that pink-footed and greylag geese will fly 15-20 km from their roosting site to feed.

7.3.8 The identification of an area as functionally linked habitat is not always a straightforward process. The importance of non-designated land parcels may not be apparent and thus might require the analysis of existing data sources (e.g., Bird Atlases or data from record centres) to be firmly established. In many instances, data may not be available at all, requiring further survey work.

European sites scoped in for this impact pathway

7.3.9 From the data searches and field surveys undertaken for the Project, the analysis suggests that there is a potential impact pathway with the following European sites within the ZoI for the loss of FLL:

- Humber Estuary SPA;
- Humber Estuary Ramsar site; and
- Thorne and Hatfield Moors SPA.

European sites scoped out for this impact pathway

7.3.10 This impact pathway is scoped out for Thorne Moor SAC and Hatfield Moor SAC, as they are designated for non-mobile features. This impact pathway is also scoped out for the Humber Estuary SAC, as the qualifying mobile features are marine and there will be no loss of marine habitats in relation to the Project.

7.4 Water Quality

7.4.1 The quality of the water that feeds a European site is an important determinant of the condition of the habitats and species it supports. Poor water quality can have a range of environmental impacts:

- At high levels, toxic chemicals and metals can result in the immediate death of aquatic life and can have detrimental effects even at lower levels, including increased vulnerability to disease and changes in wildlife behaviour.
- Construction activities that involve ground excavations and the stripping of topsoil are associated with a high risk of sediment release in surface runoff. Excessive sedimentation can smother aquatic habitats and plants, increase turbidity and accelerate eutrophication.
- Eutrophication, the enrichment of water with nutrients, increases plant growth and consequently results in oxygen depletion. Algal blooms, which commonly result from eutrophication, increase turbidity and decrease light penetration. The decomposition of organic wastes that often accompanies eutrophication deoxygenates water further, augmenting the oxygen depleting effects of eutrophication. In freshwater ecosystems, plant growth is primarily determined by phosphorus (P) concentrations, which are determined by a wide range of sources, including treated sewage effluent from Wastewater Treatment Works and urban surfaces such as roads.
- Some pesticides, industrial chemicals, and components of sewage effluent are suspected to interfere with the functioning of the endocrine system, possibly having negative effects on the reproduction and development of aquatic life.

7.4.2 Under The Water Environment (Water Framework Directive) (England and Wales) Regulations 2017 (HM Government, 2017), the Secretary of State and the Environment Agency is legally required to maintain and/or improve the ecological and chemical status of the water environment, which includes rivers, lakes, wetlands, groundwater, estuaries and coastal waters (The Welsh Ministers and Natural Resources Wales, for Wales). There should be no deterioration or prevention of future improvement in the status of waterbodies. Water Framework Directive (WFD) assessments are directly linked to HRA in that consideration must also be given when undertaking a WFD assessment to the conservation objectives of designated sites, including SACs, SPAs and Ramsar sites.

7.4.3 The magnitude of water quality impacts primarily depends on the appropriate treatment of process water and/or surface runoff.

European sites scoped in for this impact pathway

7.4.4 Overall, the available baseline information suggests that there is a potential impact pathway with the following European sites within the ZoI for waterborne pollution:

- Humber Estuary SAC;

- Humber Estuary Ramsar site; and
- Humber Estuary SPA.

European sites scoped out for this impact pathway

7.4.5 This impact pathway is scoped out for Thorne Moor SAC and Hatfield Moor SAC. These sites are designated for raised bog habitat, which gets all of its water from rainfall, snow and mist (NatureScot, 2025). As these two SACs make up Thorne and Hatfield Moors SPA, this European site can also be scoped out from this impact pathway.

7.5 Airborne Pollution

Emissions from Road Traffic

7.5.1 Construction of the Project has the potential to affect air quality. This is primarily expected due to emissions associated with exhaust emissions from construction vehicles and equipment.

7.5.2 The main pollutants of concern for European sites are nitrogen oxides (NOx), ammonia (NH_3) and sulphur dioxide (SO_2) (see Table 7.2). Ammonia can have a directly toxic effect upon vegetation, particularly at close distances to the source, such as near road verges. Nitrogen oxides can also be toxic to vegetation at very high concentrations (far above the annual average Critical Level (CL)). Furthermore, high levels of NOx and NH_3 are likely to increase the total nitrogen (N) deposition, potentially leading to deleterious knock-on effects in recipient ecosystems. An increase in N deposition from the atmosphere is widely known to enhance soil fertility and to lead to eutrophication. This often has adverse effects on plant community composition and the overall quality of semi-natural, nitrogen-limited terrestrial and aquatic habitats (World Health Organization. Regional Office for Europe, 2000) and (Wolseley, P. A., James, P. W., Theobald, M. R. & Sutton, M. A., 2006).

Table 7.2 – Main sources and effects of air pollution on habitats and species (UK Centre for Ecology and Hydrology, 2025)

Pollutant	Source	Effects on habitats and species
Sulphur dioxide (SO_2)	The main sources of SO_2 are fuel-fired electricity generation, and industrial and domestic fuel combustion; however, total SO_2 emissions in the UK have decreased substantially since the 1980s. Another origin of SO_2 is the shipping industry, and high atmospheric concentrations of SO_2 have been documented in busy ports. In future years shipping is likely to become one	Wet and dry deposition of SO_2 acidifies soils and freshwater and may alter the composition of plant and animal communities. The magnitude of impacts depends on levels of deposition, the buffering capacity of soils and the sensitivity of impacted species. However, SO_2 background levels have fallen considerably since the 1970s and are now not regarded as a threat to plant communities. For example, decreases in SO_2 concentrations have been linked to

Pollutant	Source	Effects on habitats and species
	of the most important contributors to SO_2 emissions in the UK.	returning lichen species and improved tree health in London.
Acid deposition	Leads to acidification of soils and freshwater via atmospheric deposition of SO_2, NO_x, NH_3 and hydrochloric acid (HCl). Acid deposition from rain has declined by 85% in the last 20 years, with most of this contributed by lower sulphate levels. Although future trends in SO_2 emissions and subsequent deposition to terrestrial and aquatic ecosystems will continue to decline, increased N emissions may cancel out any gains produced by reduced SO_2 levels.	Gaseous precursors (e.g., SO_2) can cause direct damage to sensitive vegetation, such as lichen, upon deposition. Acid deposition can affect habitats and species through both wet (acid rain) and dry deposition. The effects of acidification include lowering of soil pH, leaf chlorosis, reduced decomposition rates, and compromised reproduction in birds/plants. Not all sites are equally susceptible to acidification. This varies depending on soil type, bed rock geology, weathering rate and buffering capacity. For example, sites with an underlying geology of granite, gneiss and quartz-rich rocks tend to be more susceptible.
Ammonia (NH_3)	Ammonia is a reactive, soluble alkaline gas that is released following decomposition and volatilisation of animal wastes, and from some chemical processes and vehicle exhausts. It is a naturally occurring trace gas, but ammonia concentrations are directly related to the distribution of livestock. Ammonia reacts with acid pollutants, such as the products of SO_2 and NOx emissions, to produce fine ammonium (NH_4^+) – containing aerosol. Due to its significantly longer lifetime, NH_4^+ may be transferred much longer distances (and can therefore be a significant transboundary issue). While ammonia deposition may be estimated from its atmospheric concentration, the deposition rates are strongly influenced by meteorology and ecosystem type.	The negative effect of NH_4^+ may occur via direct toxicity when uptake exceeds detoxification capacity and via N accumulation. Its main adverse effect is eutrophication, leading to species assemblages that are dominated by fast-growing and tall species. For example, a shift in dominance from heath species (lichens, mosses) to grasses is often seen. As emissions mostly occur at ground level in the rural environment and NH_3 is rapidly deposited, some of the most acute problems of NH_3 deposition are for small relict nature reserves, located in intensive agricultural landscapes.
Nitrogen oxides (NO_x)	Nitrogen oxides are mostly produced in combustion processes. Half of NO_x emissions	Direct toxicity effects of gaseous nitrates are likely to be important in areas close to the source (e.g., roadside verges). A

Pollutant	Source	Effects on habitats and species
	in the UK derive from motor vehicles, one quarter from power stations, and the rest from other industrial and domestic combustion processes.	critical level of NO_x for all vegetation types has been set to 30 µg/m^3 (micrograms per cubic metre). Deposition of nitrogen compounds (nitrates (NO_3), NO_2 and nitric acid (HNO_3)) contributes to the total N deposition and may lead to both soil and freshwater acidification. In addition, NO_x contributes to the eutrophication of soils and water, altering the species composition of plant communities at the expense of sensitive species.
Total nitrogen (N) deposition	The pollutants that contribute to the total nitrogen deposition derive mainly from oxidized (e.g., NO_X) or reduced (e.g., NH_3) N emissions (described separately above). While oxidized nitrogen mainly originates from major conurbations or highways, reduced nitrogen mostly derives from farming practices. The N pollutants together are a large contributor to acidification (see above).	All plants require nitrogen compounds to grow, but too much overall N is regarded as the major driver of biodiversity change globally. Species-rich plant communities with high proportions of slow-growing perennial species and bryophytes are most at risk from N eutrophication. This is because many semi-natural plants cannot assimilate the surplus N, as well as many graminoid (grass) species. N deposition can also increase the risk of damage from abiotic factors e.g., drought and frost.
Ozone (O_3)	A secondary pollutant generated by photochemical reactions involving NO_x, volatile organic compounds (VOCs) and sunlight. These precursors are mainly released by the combustion of fossil fuels (as discussed above). Increasing anthropogenic emissions of ozone precursors in the UK have led to an increased number of days when ozone levels rise above 40 parts per billion (ppb) ('episodes' or 'smog'). Reducing ozone pollution is believed to require action at the international level in order to reduce levels of the precursors that form ozone.	Concentrations of O_3 above 40 ppb can be toxic to both humans and wildlife and can affect buildings. High O_3 concentrations are widely documented to cause damage to vegetation, including visible leaf damage, reduction in floral biomass, reduction in crop yield (e.g., cereal grains, tomato, potato), reduction in the number of flowers, decrease in forest production and altered species composition in semi-natural plant communities.

7.5.3 Sulphur dioxide (SO_2) emissions overwhelmingly derive from power stations and industrial processes that require the combustion of coal and oil, as well as shipping (particularly on a local scale). There will be no material release of SO_2 in the construction or operation/maintenance phases of the Project. Therefore, this atmospheric pollutant is not considered further in this HRA.

7.5.4 Nitrogen oxides emissions are dominated by the output of vehicle exhausts (more than half of all emissions) and some vehicles also emit NH_3. The main air quality impact of the Project is likely to occur in the construction phase, when construction traffic will lead to the temporary emission of NOx, NH_3 and, likely, an overall increase in total N deposition. According to the World Health Organisation (WHO), the Critical Level for NOx for the protection of vegetation is 30 micrograms per cubic metre (μgm^{-3}) and the Critical Level for NH_3 when lower plants are present is 1 μgm^{-3} (UK Centre for Ecology and Hydrology, 2025). In addition, ecological studies have determined Critical Loads for atmospheric nitrogen deposition (NOx combined with NH_3).

7.5.5 The Department for Transport's Transport Analysis Guidance (Department for Transport, 2025) states that beyond 200 m, the contribution of vehicle emissions from the roadside to local pollution levels is insignificant. This is the distance that is used in this HRA Report to screen for potential atmospheric pollution impacts associated with the Project.

European sites scoped in for this impact pathway

7.5.6 Overall, the available baseline information suggests that there is a potential impact pathway with the following European sites within the ZoI for airborne pollution related to traffic emissions:

- Humber Estuary SAC;
- Humber Estuary SPA; and
- Humber Estuary Ramsar site.

European sites scoped out for this impact pathway

7.5.7 This impact pathway is scoped out for Thorne and Hatfield Moors SPA and Thorne Moor SAC and Hatfield Moor SAC, as these European sites are all located beyond 200 m from a road proposed to be used by construction traffic.

Dust Deposition

7.5.8 Construction activities can generate dust emissions from operating machinery that can cause localised smothering of vegetation or potential health issues in fauna. The effects of dust will depend on the prevailing wind direction, and the transport distance is related to particle size. Dust particle size and chemical composition is important, as smaller particles can enter or block stomata and thus interfere with gas exchange, while sufficient coverage may prevent light penetration to the chloroplasts.

7.5.9 Fauna are exposed to air pollutants via three pathways:

- Inhalation of gases or small particles;
- Ingestion of particles suspended in food or water; or

- Absorption of gases through the skin. It is likely that birds are even more susceptible to gaseous pollutant injury than mammals due to their higher respiratory rates.

7.5.10 For the purposes of screening, according to guidance from the Institute of Air Quality Management (IAQM) (Institute of Air Quality Management, 2024), with respect to possible effects due to dust:

'An assessment will normally be required where there is…an 'ecological receptor' within: 50 m of the boundary of the site; or 50 m of the route(s) used by construction vehicles on the public highway, up to 250 m from the site entrance(s)'.

7.5.11 However, in agreement with Natural England (NE), as a precautionary approach noting the potential for dust, the same ZoI has been applied to both ecological and human receptors; therefore, impacts have been considered up to 250 m from dust-generating activities, and 50 m from the route(s) used by construction vehicles on the public highway up to 250 m from the proposed bell mouths.

European sites scoped in for this impact pathway

7.5.12 Overall, the available baseline information suggests that there is a potential impact pathway with the following European sites within the ZoI for airborne pollution rated to dust:

- Humber Estuary SAC;
- Humber Estuary SPA; and
- Humber Estuary Ramsar site.

European sites scoped out for this impact pathway

7.5.13 This impact pathway is scoped out for Thorne and Hatfield Moors SPA, Thorne Moor SAC and Hatfield Moor SAC, as these European sites are all beyond 250 m from the Project.

7.6 Hydrological Changes

7.6.1 The water level, its flow rates and the mixing conditions are important determinants of the conditions present within European sites, and the state of their qualifying features. Hydrological processes are critical in influencing habitat characteristics in coastal waters, including parameters such as current velocity, water depth, dissolved oxygen (DO) concentrations, salinity and water temperature. In turn, these parameters determine the short- and long-term viability of plant and animal species, as well as overall ecosystem composition. Changes to the water flow rate within an estuary can be associated with a multitude of knock-on impacts, including substratum loss, smothering and changes in wave exposure.

7.6.2 The unique nature of wetlands combines shallow water and conditions that are ideal for the growth of organisms at the basal level of food webs, which feed many species of birds, mammals, fish and amphibians. Overwintering, migrating and breeding wetland bird species are particularly reliant on these food sources, as they need to build up enough nutritional reserves to sustain their long migration routes or feed their hatched chicks.

7.6.3 The proliferation of impermeable surfaces increases the volume and speed of surface water runoff. Traditional drainage systems often cannot cope with the volume of runoff, particularly during intense rainfall events, resulting in downstream flooding of ecological receptor sites.

European sites scoped in for this impact pathway

7.6.4 Overall, the available baseline information suggests that the there is a potential impact pathway with the following European sites for hydrological change:

- Humber Estuary SAC;
- Humber Estuary SPA; and
- Humber Estuary Ramsar site.

European sites scoped out for this impact pathway

7.6.5 This impact pathway is scoped out for Thorne Moor SAC and Hatfield Moor SAC as there is no hydrological connectivity to the Project. These sites are designated for raised bog habitat, which gets its water from rainfall, snow and mist (NatureScot, 2025). As these two SACs make up Thorne and Hatfield Moors SPA, this European site can also be scoped out from this impact pathway.

7.7 Disturbance of Qualifying Features

7.7.1 Development can result in noise/vibration[9], or visual disturbance to qualifying features, both within European sites themselves and within areas of FLL, during the construction and operational (including maintenance) phases. For example, noise/vibration and visual disturbance arising from construction may result in temporary behavioural changes in some species (e.g., interruption or cessation of foraging, minor and major flight responses). During the operational phase, noise emitted from developments may permanently affect site usage of breeding, foraging and roosting birds. Disturbance from site usage by operational site staff, road traffic and operational lighting might also arise. Three of the most important factors determining the magnitude of disturbance from proposed developments on ecological receptors are considered to be individual species sensitivity, proximity of the disturbance source and timing/duration of the disturbance.

7.7.2 Both noise and visual stimuli may elicit disturbance responses, potentially affecting the fitness and survival of qualifying features. Noise is a complex disturbance parameter requiring the consideration of multiple factors, including its non-linear scale, non-additive effect and source-receptor distance. Professional judgement suggests that a high level of noise disturbance constitutes a sudden noise event of over 60 decibels (dB) or prolonged noise of over 72 dB (Cutts, Phelps, & Burdon, 2009). Bird responses to high noise levels include major flight or the cessation of feeding, both of which might affect the survival of birds, particularly if other stressors are also present (e.g., cold weather, food scarcity).

7.7.3 Generally, research has shown that above noise levels of 84 dB, waterfowl show a flight response, while at levels below 55 dB, there is no effect on their behaviour (Cutts, N., Hemingway, K & Spencer, J., 2013). Therefore, these two thresholds are

[9] Underwater noise is simply vibration that has travelled through water as a pressure wave.

considered useful as defining two extremes. Generally, noise is attenuated by 6 dB with every doubling of distance from the source. Impact piling, the noisiest construction activity (approximately 110 dB at 0.67 m from source), will thus reduce to 67–68 dB by 100 m away from the source. This implies that the loudest construction noise should have fallen to below disturbing levels by 100 m (and certainly by 200 m) away from the source, even without mitigation. Noise levels from less noisy construction activities, such as Horizontal Direct Drilling (HDD) (approximately 85 dB at source), are expected to dissipate over considerably shorter distances. Note that this is a rule of thumb and does not obviate the need for application-level noise modelling.

7.7.4 The following parameters for the assessment of noise disturbance impacts have been identified in discussions with Natural England on other proposed developments:[10]

- Changes of 3 dB in noise level compared to the pre-construction baseline are perceptible at the receptor (although not necessarily disturbing) and should be screened in for AA.
- Noise levels below 55 dB are unlikely to be disturbing, regardless of the difference to the baseline.
- Noise levels between 55 dB and 70 dB may be disturbing depending on the degree of change (for example, a change in noise level of 10 dB represents a doubling in loudness and, therefore, likely to be disturbing), nature of the sound (i.e., maximum A-weighted sound level (LA_{max}) or A-weighted equivalent continuous sound level (LA_{eq})), duration of exposure and extent of habitat impacted.
- Noise levels above 70 dB are likely to be disturbing, unless qualifying birds are already subject to similarly high noise levels as part of their baseline soundscape.

7.7.5 Since it is possible to be confident that no disturbance will occur at 55 dB, this is the threshold that is used in this assessment to screen for potential noise disturbance impacts associated with the Project. This threshold was agreed in a meeting with Natural England on 28 May 2025 as noted in **Application Document 6.9 Environmental Statement Chapter 9 Ornithology**.

7.7.6 Generally, visual stimuli are considered to have a higher disturbance potential than noise stimuli as, in most instances, visual stimuli will elicit a disturbance response at much greater distances than noise (Cutts, Phelps, & Burdon, 2009). For example, a flight response is triggered in most species when they are approached to within 150 m across a mudflat. Visual disturbance can be exacerbated by workers moving across open habitats undertaking sudden movements and using large machinery. Several species are particularly sensitive to visual disturbance, including curlew, taking flight at 275 m; redshank at 250 m; shelduck at 199 m; and bar-tailed godwit at 163 m (Cutts, N., Hemingway, K & Spencer, J., 2013).

7.7.7 Overall, specific regard will be given to assemblage composition when identifying threshold levels for both visual and noise disturbance. It is likely that different avian species are differently affected by developments, depending on the types of habitat present, spatial requirements of ecological receptor species (e.g., flocking species

[10] Discussions over noise disturbance to SPA/Ramsar sites took place over several projects, including the Sea Link and Viking CCS Pipeline developments.

such as pink-footed goose require large areas of supporting habitat), species-specific foraging behaviour and individual species sensitivity.

7.7.8 Fish can be impacted by underwater sound/vibration, which can either be impulsive or continuous in nature, and can cause a variety of impacts to fish, ranging from severe physical injury (e.g., rupture of the swim bladder), physical damage to the auditory system (e.g., temporary shifts in hearing thresholds), to behavioural changes, such as disruption of migratory behaviours.

7.7.9 Fish that rely on acoustic communication may be the most obvious to be affected by anthropogenic noise (Van der Sluijs, I., Gray, S.M., Amorim, M.C.P., Barber, I., Candolin, U., Hendry, A.P., Krahe, R., Maan, M.E., Utne-Palm, A.C., Wagner, H-J & Wong, B.B.M., 2011), (Radford, A.N., Kerridge, E. & Simpson, S.D., 2014). However, all fish have the capability to hear low-frequency sounds (< 500 Hertz (Hz)) and, consequently, can be disturbed by noisy human activities (Popper, A.N., Fay, R.R., Platt, C., et al, 2003), and (Popper, A.N., Hawkins, A.D., Fay, R.R., et al, 2014).

7.7.10 General effects of noise/vibration on aquatic life have been reviewed extensively (De Jong, K., Forland, T.N., Amorim, M.C.P. et al, 2020). These reviews highlight a critical need for data on population level effects, including reproduction, as successful reproduction is essential for population viability. For many fish species, the spawning period may be highly sensitive to impacts from noise/vibration if individuals gather in dense, localised spawning aggregations (Colin, Sadovy, & Domeier, 2003). A disturbance during spawning may thus hamper a much larger fraction of the population, compared to other periods of the year. Additionally, during this critical period, fish may also be most vulnerable to external stressors (Pörtner, H.O. & Farrel, A.P., 2008) because fish are often in their poorest body condition during the spawning period (Holst, J.C., 2004), (Rose, G.A., Bradbury, I.R. & de Young, B., 2008).

7.7.11 Underwater noise/vibration has the potential to affect marine mammals through injury, by causing physiological damage to the individuals' auditory or other internal organs, and temporary or continuous disturbance, which includes disruption to behavioural patterns such as migration, nursing, breeding, foraging, socialising and/or sheltering (JNCC, Natural England and the Countryside Council for Wales, 2010). Airborne sound and visual disturbance are only considered relevant for pinnipeds (seals).

European sites scoped in for this impact pathway

7.7.12 Overall, the available baseline information suggests that there is a potential impact pathway with the following European sites within the ZoI for disturbance of qualifying features:

- Humber Estuary SAC;
- Humber Estuary SPA;
- Humber Estuary Ramsar site; and
- Thorne and Hatfield Moors SPA.

European sites scoped out for this impact pathway

7.7.13 This impact pathway is scoped out for Thorne Moor SAC and Hatfield Moor SAC, as both sites are beyond the 1 km ZoI, and are also designated for non-mobile features, i.e., habitats; therefore, there is no pathway between these sites and this potential impact pathway.

7.8 Barriers to Movement

7.8.1 Development, including transmission lines, can lead to habitat fragmentation and impede the movement of wildlife. Many species rely on the ability to move throughout the landscape to fulfil their needs for survival or complete their life cycles. New structures can therefore potentially affect the ability of species to move across terrestrial landscapes by adding obstacles, impacting FLL, and increasing habitat fragmentation. This can have a detrimental impact to many species.

European sites scoped in for this impact pathway

7.8.2 Overall, the available baseline information suggests that there is a potential impact pathway with the following European sites and associated FLL within the ZoI for barriers to the movement of qualifying features:

- Humber Estuary SPA;
- Humber Estuary Ramsar site; and
- Thorne and Hatfield Moors SPA.

European sites scoped out for this impact pathway

7.8.3 This impact pathway is scoped out for Thorne Moor SAC and Hatfield Moor SAC on the basis that they are designated for non-mobile features and/or non-aerial species. It is also scoped out for the Humber Estuary SAC, as no main river channels will be obstructed.

7.9 Injury or Mortality

7.9.1 Guidance produced by NatureScot (NatureScot, 2025) identifies the main sources of potential risk to birds from the presence of transmission overhead lines to be:

- Mortality or injury through collision with transmission lines (including conductors and earth wires) or supporting structures. On power lines, bird collisions are often concentrated along relatively short sections, where several factors interact to create a collision problem or ‘hotspot’.
- Mortality through electrocution on transmission lines is unlikely, due to the large air gaps between live and earthed components. Birds that perch or nest on steel lattice pylons are therefore unlikely to be electrocuted by causing a short circuit, either by touching two live wires, or a live and an earthed component as, due to the air gap touching two of these components at the same time is highly unlikely.

7.9.2 The principal factors affecting the risk of bird mortality through collision and electrocution are:

- Species-specific morphology and biology. Birds with larger body sizes and high wing loadings, birds flying in flocks and/or in low light, birds with limited visual capacity, birds distracted while engaged in hunting/breeding behaviours, younger and more inexperienced birds, and migrants not familiar with the landscape, may all be at increased collision risk. For example, swans and other large waterfowl are of particular concern for collisions in the UK (Taylor, C., Hartley, I. & Rees, E., 2015).
- Landscape and topography, for example, siting of overhead lines near important habitats or flyways may increase collision risk.
- Weather affecting flight capability or visibility (strong winds/fog/heavy rain), which may force birds to lower their normal flight heights, affect flight control and reduce visibility, and therefore reduce ability to avoid collisions.
- Technical aspects of the transmission line, including the spacing of conductors and the creation of perches.
- The presence of existing barrier features that already result in changes to bird flight behaviours, e.g., an embankment, woodland block, building or existing infrastructure corridor.

7.9.3 Earth wires are thought to be responsible for a much higher rate of collisions than the thicker, often bundled conductor wires. Earth wires are harder for birds to see, being thinner in diameter and typically positioned at the top of the wire array. Birds trying to gain height to avoid the larger, more visible conductor wires may fail to see the earth wire.

European sites scoped in for this impact pathway

7.9.4 Overall, there is a potential impact pathway with the following European sites and relevant FLL within the ZoI for injury or mortality.

- Humber Estuary SPA;
- Humber Estuary Ramsar site; and
- Thorne and Hatfield Moors SPA.

European sites scoped out for this impact pathway

7.9.5 This impact pathway is scoped out for the Humber Estuary SAC, Thorne Moor SAC and Hatfield Moor SAC, on the basis that they are designated for non-mobile features and/or non-aerial species.

7.10 Spread of Invasive Non-Native Species

7.10.1 An INNS is a species that is: 1) non-native (or alien) to the ecosystem under consideration; and 2) whose introduction causes, or is likely to cause, economic or environmental harm, or harm to human health. They can be introduced to an area by, for example, ship ballast water, accidental release, and most often, by people. invasive non-native species can lead to the extinction of native plants and animals, destroy biodiversity and permanently alter habitats. Any construction activity can

introduce INNS if inadequate biosecurity protocols are followed, particularly when working in the riverine environment.

European sites scoped in for this impact pathway

7.10.2 Overall, the available baseline information suggests that there is a potential impact pathway with the following European sites within the ZoI spread of INNS:

- Humber Estuary SAC;
- Humber Estuary SPA; and
- Humber Estuary Ramsar site.

European sites scoped out for this impact pathway

7.10.3 This impact pathway is scoped out for Thorne and Hatfield Moors SPA, Thorne Moor SAC and Hatfield Moor SAC, on the basis that they are all a significantly greater distance away from the Project than the 50 m ZoI identified in Table 5.1.

7.11 Summary

7.11.1 Based on the outcomes of the scoping and data gathering exercise, Table 7.3 presents the European sites, their proximity to the Project, and potential impact pathways that are considered relevant to this HRA Report during construction and/or operation/maintenance.

Table 7.3 – Relevant European sites and associated potential impact pathways in relation to the phase of development

European site	Approximate distance from Order Limits	Potential impact pathways	Phase of development	
			Construction	Operation and Maintenance
Humber Estuary SAC	Within	Water quality;	✓	✓
		• Airborne pollution (from both emissions from road traffic and dust deposition);	✓	✓
		• Hydrological changes;	✓	✓
		• Disturbance of qualifying features –fish[11];	✓	✓
		• Spread of INNS.	✓	-

[11] While noise and visual disturbance to qualifying fish is considered, the Project will not result in the permanent loss of freshwater and bankside habitat. Therefore, permanent habitat loss in relation to this qualifying feature is not considered.

European site	Approximate distance from Order Limits	Potential impact pathways	Phase of development	
			Construction	Operation and Maintenance
Humber Estuary SPA	Within	Loss of FLL;	✓	✓
		• Water quality	✓	✓
		• Airborne pollution (from both emissions from road traffic and dust deposition);	✓	✓
		• Hydrological changes;	✓	✓
		• Disturbance of qualifying features;	✓	✓
		• Barriers to movement	-	✓
		• Injury/mortality	-	✓
		• Spread of INNS.	✓	-
Humber Estuary Ramsar site	Within	Loss of FLL	✓	✓
		• Water quality	✓	✓
		• Airborne pollution (from both emissions from road traffic and dust deposition)	✓	✓
		• Hydrological changes	✓	✓
		• Disturbance of qualifying feature	✓	✓
		• Barriers to movement	-	✓
		• Injury/mortality;	-	✓
		• Spread of INNS	✓	-
Thorne and Hatfield Moors SPA	2.70 km west	Loss of FLL	✓	✓
		• Disturbance to qualifying features (within FLL)	✓	✓
		• Barriers to movement	-	✓

European site	Approximate distance from Order Limits	Potential impact pathways	Phase of development	
			Construction	Operation and Maintenance
		• Injury or mortality (collision risk)	-	✓
Thorne Moor SAC	2.70 km west	No pathways have been identified with this European site.	-	-
Hatfield Moor SAC	5.73 km west	No pathways have been identified with this European site.	-	-

8. HRA Stage 1: Screening for Likely Significant Effects (LSEs)

8.1 Introduction

8.1.1 This section evaluates whether it is possible to rule out the risk of the Project having LSEs on the qualifying features of those European sites where a potential impact pathway has been identified.

8.1.2 In line with case law (People Over Wind and Sweetman v Coillte Teoranta (C-323/17)), consideration cannot be given at this stage to specific mitigation measures designed to avoid significant effects on a European site. However, design features or characteristics that are integral to the Project, such as its layout, timing and location, can be taken into account.

8.1.3 Standard good practice works methods will be integral features of the Project regardless of the presence of European sites, would include the implementation of pollution prevention measures following Department for Environment, Food and Rural Affairs (Defra) and Environment Agency guidance for pollution prevention (Department for Environment, Food and Rural Affairs & Environment Agency, 2024). Therefore, it is permissible to take these measures into account in HRA Stage 1: Screening. Such measures are set out in **Application Document 7.3 Register of Environmental Actions and Commitments**.

8.1.4 Equally, under the Wildlife and Countryside Act 1981 (HM Government, 1981), it is an offence in England and Wales to cause any animal or plant to spread or grow in the wild outside of its native range. Appropriate biosecurity measures will therefore be implemented during the construction and operational phases to prevent the spread of INNS Such measures are set out in **Application Document 7.3 Register of Environmental Actions and Commitments**.

8.1.5 The test of LSE in this section is necessarily a high-level appraisal, with a precautionary approach adopted when reaching a conclusion. For those impacts for which LSE cannot be ‘screened out’, further appraisal at Stage 2: Appropriate Assessment has been carried out.

8.1.6 Each European site is presented in the following screening matrices, which set out the qualifying interest features of those European sites identified in section 6. These are presented in Appendix E.

8.1.7 The design life of the Project is at least 80 years but with regular maintenance is likely to extend further. At the time that decommissioning would take place, the regulatory framework, good industry practices and the future baseline could have altered. At the point where the Project requires decommissioning, National Grid would consider and implement an appropriate decommissioning strategy, taking account of good industry practice, its obligations to landowners under the relevant agreements, and all relevant statutory requirements. As such, decommissioning is excluded from the HRA.

8.2 Construction Phase

Loss of Functionally Linked Land

Summary of potential impact pathways

8.2.1 A potential impact pathway from loss of FLL between Tower 4AF40, near Brantingham, and Tower 4AF127, near Keadby, has been identified on the following European sites:

- Humber Estuary SPA;
- Humber Estuary Ramsar site; and
- Thorne and Hatfield Moors SPA.

European sites screened in

8.2.2 Construction of the Project would require temporary land-take for access tracks, construction compounds and working areas.

8.2.3 As set out in **Application Document 6.8 Environmental Statement Chapter 8 Ecology** and **Application Document 6.9 Environmental Statement Chapter 9 Ornithology**, much of the land within the Order Limits comprises predominantly arable land, which is suitable for use by several qualifying features of the Humber Estuary SPA/Ramsar site.

8.2.4 Since 2022, a suite of ornithological surveys has been undertaken along the length of the Order Limits to provide supporting information for this HRA. These surveys recorded qualifying features for Humber Estuary SPA/Ramsar site.

8.2.5 With qualifying features being recorded during field surveys, LSEs on the Humber Estuary SPA/Ramsar site, due to loss of FLL habitat during construction, cannot be screened out and have been taken forward to the Stage 2: Appropriate Assessment.

European sites screened out

8.2.6 Thorne and Hatfield Moors SPA is designated for breeding nightjar (Natural England, 2014). Although arable land is not a preferred habitat type, the Nightjar Tracking Project, carried out by the British Trust for Ornithology (BTO) and Natural England (British Trust for Ornithology (BTO), 2017), did find that most pairs forage 1–5 km from their heathland or forest nest sites, and favour feeding in grassland and other farmland habitats that support abundant moths.

8.2.7 The Supplementary Advice on Conservation Objectives (SACO) for the Thorne and Hatfield Moors SPA (Natural England, 2019) indicates that the location of feeding areas supporting nightjar is often poorly understood. However, monitoring at other European sites suggests that nightjar focus on particularly rich feeding sites, often avoiding superficially similar habitats closer to their breeding sites. Tagging studies of nightjar in the SPA indicate that birds typically forage within 3 km of the SPA boundary, with only few individuals travelling further off-site (up to 5 km). At its closest, the SPA lies approximately 2.7 km from the Order Limits, which is within the typical 3 km range discussed above. Foraging nightjars have not been detected during the nightjar surveys undertaken for the Project, as described in **Application Document 6.9.A2 Environmental Statement Appendix 9.2 Ornithology Baseline**

Report. As nightjar has not been detected during surveys, and the Project is located close to the edge of the typical foraging range for this species and contains suboptimal foraging habitat, LSE can therefore be screened out for Thorne and Hatfield Moors SPA in relation to this impact pathway during construction.

Water Quality

Summary of potential impact pathways

8.2.8 A potential impact pathway from waterborne pollution has been identified on the following European sites:

- Humber Estuary SAC;
- Humber Estuary SPA; and
- Humber Estuary Ramsar site.

European sites screened in

8.2.9 None of the European sites with a potential water impact pathway with the Project have been screened in.

European sites screened out

8.2.10 Two of the most important factors influencing the likelihood of potential water quality impacts of developments are the presence of a hydrological connection with, and flow-path distance to, European sites. The Project crosses the River Ouse at the point at which it is designated as the Humber Estuary SAC, SPA and Ramsar site and, therefore, there is a hydrological connection pathway for potential waterborne pollution impacts. Furthermore, the Order Limits are permeated by a large number of agricultural ditches and drains, which may carry significant volumes of water at times. As a precautionary measure, and in line with Pre-Application Advice on Environmental Impact Assessment (Planning Inspectorate, 2026) it is assumed that these drains and ditches have hydrological connectivity with the Humber Estuary SAC/SPA/Ramsar site.

8.2.11 The Environmental Damage (Prevention and Remediation) (England) Regulations 2015 and The Environmental Permitting (England and Wales) Regulations 2016 make it an offence to pollute watercourses, irrespective of whether they are European Sites or connect to European Sites. The construction phase on every project must have a duty of care to the water environment and produce and implement plans and procedures to prevent discharge from works entering surface, groundwater, wetlands, or coastal waters. As such in line with Nationally Significant Infrastructure Projects: Advice on Habitats Regulations Assessments (Planning Inspectorate, 2026), these elements which are fundamental to a project's design (e.g., location, timing) and measures that are integral or incorporated within the DCO application and not intended specifically to avoid or reduce effects on any European site can be considered during Stage 1: Screening. It is legitimate to take these into consideration at the screening stage of HRA since they are not being introduced specifically to protect European Sites.

8.2.12 These measures include:

- Utilising existing watercourse crossing points as far as practicable;

- Large or sensitive watercourses, for example, those designated as main river, and those with WFD status, will be crossed by the temporary haul road using temporary clear span bridges; and
- Application of appropriate stand-off distances[12] to watercourses to avoid direct effects where practicable.

8.2.13 **Application Document 7.3 Register of Environmental Actions and Commitments** includes the following relevant to the control and management of impacts that could affect the water environment, will be implemented during construction of the Project to limit effects through adherence to good site practices and achieving legal compliance. Measures that form part of the Project design or that are not included for the purpose of avoiding or minimising risk to a European site can be considered at this stage of the HRA process.

- DE1: The Project will be run in compliance with all relevant legislation, consents and permits including the limitations and requirements set out in the DCO.
- GG01: The final versions of the outline environmental management plans will be submitted for approval in accordance with the requirements, as secured by **Application Document 3.1 Draft Development Consent Order** prior to commencement of development and will reflect the final construction methodologies produced by the Main Works Contractor(s). The following will be produced prior to construction:
  - Code of Construction Practice (CoCP);
  - Construction Traffic Management Plan (CTMP);
  - Soil Management Plan (SMP);
  - Public Rights of Way Management Plan;
  - Cultural Heritage Management Plan.
  - Framework Construction Surface Water Management Plan (CSWMP)
  - Noise and Vibration Management Plan;
  - Landscape and Ecology Management Plan (LEMP)
  - Archaeological Written Scheme of Investigation (WSI).
  - All construction works will be undertaken in general accordance with these plans and all referenced subordinate plans.
- GG02: The Main Works Contractor(s) will undertake site inspections to check conformance to the measures set out within each of the management plans and their subordinate plans as set out within GG01.
- GG15: Fuels, oils and chemicals will be stored responsibly, away from sensitive water receptors. Where practicable, they will be stored more than 15 m from watercourses, ponds and groundwater dependent terrestrial ecosystems. Where it is not practicable to maintain a >15 m distance, additional measures will be

[12] 'Stand-off distances' refers to a buffer between the proposed infrastructure and associated construction works, and a receptor, such as a watercourse.

identified by the Main Works Contractor(s) These measures may include double bunded bowsers.

- GG16: All refuelling, soiling and greasing of construction plant and equipment will take place above drip trays and also away from drains as far as is reasonably practicable. Vehicles and plant will not be left unattended during refuelling. Appropriate spill kits will be made easily accessible for these activities.
- GG19: Runoff across the site will be controlled through a variety of methods including header drains, buffer zones around watercourses, on-site ditches, silt traps and bunding. There will be no intentional discharge of site runoff to ditches, watercourses, drains (including highway drainage systems), or sewers without appropriate treatment and agreement of the appropriate authority. All practicable steps will be put in place to prevent pollution of watercourses. In the case of an emergency, protocols will be followed as per an Emergency Response Plan to be produced by the Main Works Contractor(s) in accordance with GG25 below.
- GG25: An Emergency Response Plan will be developed by the Main Works Contractor(s) for the construction phase which will outline procedures to be implemented and to be followed in case of unplanned events, including but not limited to site flooding and pollution incidents.

8.2.14 It is considered that the Project will be constructed in a way to prevent pollution to the water environment to ensure no adverse effects from water pollution on any European site. LSEs arising from changes in water quality can therefore be screened out for all European sites.

Airborne Pollution

Summary of potential impact pathways

8.2.15 A potential impact pathway from airborne pollution has been identified on the following European sites:

- Humber Estuary SAC;
- Humber Estuary SPA; and
- Humber Estuary Ramsar site.

European sites screened in for dust deposition

8.2.16 Operating machinery and techniques employed during the construction of the Project have the potential to increase local dust levels with knock-on effects on ecological receptors. Dust deposition is of particular concern for plants, due to its direct interference with gaseous exchange by blocking stomata. In addition, any dust suspended in the water column of aquatic habitats may also affect the turbidity, temperature and other water quality parameters. This can trigger changes in aquatic community composition and also affect the ability of bird species to feed, many of which are visual foragers.

8.2.17 The dust emissions magnitude has been determined as large for earthworks, medium for construction, and large for trackout (deposition of dust and dirt from construction sites onto public roads by construction vehicles). Combining the dust emissions magnitude and area sensitivities, the overall risk of impacts with no applied mitigation for each construction activity has been determined. The potential

risk of dust soiling is high for earthworks, construction, and trackout. The potential risk of dust soiling and ecological impacts is high for earthworks and trackout and medium for construction. The construction dust risk determined that the overall worst-case risk of dust effects would be high for ecological receptors within 250 m of the Order Limits (**Application Document 6.15 Environmental Statement Chapter 15 Air Quality**). The Humber Estuary SAC/SPA/Ramsar site lies within 250 m and as such, LSEs due to dust cannot be screened out.

European sites screened out for exhaust emissions

8.2.18 Traffic exhaust emissions contribute oxides of nitrogen and (from petrol exhausts) ammonia. These are pollutants but also contribute to nitrogen deposition (and thus acid deposition). Nitrogen deposition is a form of fertilisation that can change vegetation structure and species composition. Guidance from the IAQM (Institute of Air Quality Management, 2019) and Natural England (Natural England, 2018) identify that traffic exhaust emissions can affect ecological sites within 200 m of the source.

8.2.19 The IAQM guidance (Institute of Air Quality Management (IAQM) & Environmental Protection UK, 2017) sets out criteria to establish the need for an air quality assessment for the construction or decommissioning phase of a development, as being a change of Heavy Goods Vehicles (HGV) flows of more than 100 Annual Average Daily Traffic (AADT) outside an Air Quality Management Area (AQMA). In the case of the Project, HDVs are equivalent to Heavy Goods Vehicles (HGVs).

8.2.20 The maximum AADT construction flows on any road in the peak year of 2029 is predicted to be 122 Light Goods Vehicles (LGVs) and 100 HGVs, which is below the IAQM screening criteria for further assessment. Further details of the construction traffic flows are presented in **Application Document 6.14 Environmental Statement Chapter 14 Traffic and Transport**.

8.2.21 Moreover, there are no designated European sites located within 200 m of the Affected Road Network (ARN) therefore further assessment of construction vehicle impacts on ecological sites has been screened out as potential impacts are considered to be negligible (**Application Document 6.15 Environmental Statement Chapter 15 Air Quality**). Therefore, there is no potential for the Project to result in LSEs on the Humber Estuary SAC/SPA/Ramsar site regarding traffic exhaust emissions in the construction phase.

8.2.22 Non-Road Mobile Machinery (NRMM) can also produce gaseous and particulate pollutants. Whilst NRMM could be used anywhere within the Order Limits, its use would be transient and the majority of stationary plant equipment, such as temporary generators, would be used within the construction compounds. Natural England's Standard Advice for Air Quality Impacts in National Significant Infrastructure Projects (Natural England, 2026) states a screening criteria of 500 m for general combustion processes (under 20 MW energy input), applicable for designated ecological sites. There are no European sites within 500 m of the construction compounds; therefore, in line with step 1 of Natural England's standard advice (Natural England, 2026), there is no credible risk of an adverse effect on the Humber Estuary SAC/SPA/Ramsar site regarding NRMM emissions during construction and no further detailed modelling or in combination assessment of temporary generator use is required (**Application Document 6.15 Environmental Statement Chapter 15 Air Quality**). Therefore, there is no potential for the Project to result in LSEs on the Humber Estuary SAC/SPA/Ramsar site regarding NRMM emissions during construction.

Hydrological Changes

Summary of potential impact pathways

8.2.23 A potential impact pathway from hydrological change has been identified on the following European sites:

- Humber Estuary SAC;
- Humber Estuary SPA; and
- Humber Estuary Ramsar site.

European sites screened in

8.2.24 None of the European sites with a potential impact pathway with the Project have been screened in.

European sites screened out

8.2.25 Abiotic conditions in the Humber Estuary SAC/SPA/Ramsar site depend on a complex interplay of freshwater and seawater input. For example, the volume of freshwater input influences the salinity of estuarine habitats, with knock-on implications for plant and invertebrate community composition.

8.2.26 The Project could have the following potential impacts on hydrological change:

- Meeting the potable water supply requirements for site staff and construction processes may result in the drawdown of local water levels.
- Dewatering activities undertaken for trenchless crossings associated with third-party works may affect groundwater levels, groundwater quality and groundwater flows.
- Connection of aquifer units may create potential pathways due to excavations at trenchless crossing locations.
- Construction working areas and access tracks may introduce a temporary net increase in impermeable surfaces, with the potential to increase runoff rates.

8.2.27 With regard to potable water, the Project is situated in the supply area of Yorkshire Water, Anglian Water and Severn Trent Water, all of which have a statutory obligation to deliver potable water to new developments without negatively impacting the environment (including European sites).

8.2.28 The water demand during the construction phase is temporary in nature, associated with welfare and site activities and would be concentrated during the main build period. The Project would have no discernible water demand during its operation (and maintenance). Overall, since no additional water supplies beyond existing consents and licensed volumes will be required to meet the potable water demand**,** there is no potential for the Project to result in LSEs on the Humber Estuary SAC/SPA/Ramsar site regarding water supply in the construction phase, further information is available in **Application Document 6.11.A2 Environmental Statement Appendix 11.2 Water Resources Assessment**.

8.2.29 Dewatering during construction at trenchless crossings has the potential to affect groundwater due to the reduction in groundwater levels, and also affect groundwater quality and groundwater flows, which could have a potential impact on surrounding sensitive receptors, such as groundwater abstractions, and lead to significant effects.

8.2.30 Dewatering that actively lowers the groundwater table is not anticipated (**Application Document 6.12 Environmental Statement Chapter 12 Geology and Hydrogeology**). In the event that dewatering should be required, a further groundwater risk assessment will be undertaken to assess the potential impacts and effects on groundwater and identified groundwater receptors. The groundwater risk assessment will identify where additional hydrogeological risk assessment is likely to be required once detailed design is complete, to determine any mitigation that may be required. In addition, as per commitment GH09 in **Application Document 7.3 Register of Environmental Actions and Commitments** temporary dewatering would be undertaken in accordance with Environment Agency guidance and if required the appropriate permits/licences would be obtained.

8.2.31 However, further groundwater risk assessment, and if required, localised hydrogeological risk assessment (in accordance with GH09 of **Application Document 7.3 Register of Environmental Actions and Commitments**) will be undertaken to identify any potential effects in relation to proposed construction methods and dewatering, and identify any additional mitigation required. In addition, commitment GH07 of **Application Document 7.3 Register of Environmental Actions and Commitments** secures the requirement for provision of a foundation works risk assessment which would be undertaken once the proposed foundation solutions and trenchless crossing technique is known. The foundation works risk assessment would be undertaken in accordance with Environment Agency guidance and determine any mitigation required, such that significant effects are considered unlikely.

8.2.32 There is potential for increased volumes and rates of surface runoff from temporary and/or permanent impermeable surfaces within the Project, such as compacted access tracks and watercourse crossings. While the risk of material hydrological effects from each individual surface is likely to be small, the cumulative increase in runoff from all surfaces is considered here as a precautionary measure.

8.2.33 Any works with the potential to affect the floodplain or flow regime of a main river would be subject to consent under The Environmental Permitting (England and Wales) Regulations 2016 (HM Government, 2016). Similarly, works with potential to impede land drainage or the flow regime of any ordinary watercourse would be subject to consent under the Land Drainage Act 1991 (HM Government, 1991).

8.2.34 Therefore, the construction phase for every proposed development must have a duty of care to the water environment, and to produce and implement plans and procedures to prevent discharge from works entering surface, groundwater, wetlands or coastal waters. Control and management measures, comprising management activities and techniques, will be implemented during construction of the Project to limit effects through adherence to good site practices and achieving legal compliance.

8.2.35 **Application Document 7.3 Register of Environmental Actions and Commitments** includes but is not limited to the following relevant control and management measures that could affect the water environment:

- W01: All qualifying works within and in proximity to main rivers and flood defences will be undertaken in accordance with a method approved under environmental permits issued under The Environmental Permitting (England and Wales) Regulations 2016 (HM Government, 2016).

- W05: Where new or additional surfacing is required on any construction access tracks and compound areas, these will be permeable surfaces where ground conditions allow. The Project will incorporate appropriate surface water drainage measures into the final design for any access tracks so that they do not lead to a significant increase in flood risk. Construction access tracks will be removed at the end of the construction phase, and the ground surface will be reinstated to pre-Project levels.
- W09: Severance of existing land drainage routes, including agricultural field drainage systems would be managed during construction through provision of temporary alternative drainage routes. Any affected drainage systems will be reinstated or replaced to ensure their existing function is maintained.
- DE18: Temporary infrastructure such as construction compounds, laydown areas (as well as areas where impermeable material will be installed or where heavy equipment will be used) and construction access tracks will be drained using sustainable drainage systems (SuDS) techniques that are suitable for local ground conditions and topography. These areas will be reinstated after completion of the temporary works, as agreed with the landowner.

8.2.36 As such, it is considered that new infrastructure can be constructed in a way to prevent hydrological changes to the water environment to ensure no adverse effects from hydrological changes on any European site. LSE can therefore be screened out for all European sites through this impact pathway.

Disturbance of Qualifying features

Summary of potential impact pathways

8.2.37 A potential impact pathway from disturbance to qualifying features has been identified on the following European sites:

- Humber Estuary SAC;
- Humber Estuary SPA;
- Humber Estuary Ramsar site; and
- Thorne and Hatfield Moors SPA.

European sites screened in

8.2.38 A range of construction activities will be required for the Project, which will involve the presence of site staff and usage of heavy machinery within the Order Limits. These activities have the potential to result in noise and visual disturbance to sensitive ecological receptors, both within European sites and functionally linked habitats outside European site boundaries. Similarly, construction activities like piling generate noise/vibrations that can transmit through water. Disturbance is highlighted as a key threat to the conservation objectives of the Humber Estuary SPA/Ramsar site in its Site Improvement Plan (SIP) (Natural England, 2014) and its SACO (Natural England, 2023). Most of the disturbance elements can be introduced or exacerbated by construction activities, carried out in proximity to key foraging or roosting habitats of SPA/Ramsar site qualifying features

8.2.39 The Order Limits comprises extensive tracts of agricultural land which lie within the maximum foraging ranges of some of the qualifying features in the Humber Estuary SPA/Ramsar site. There are also areas of reed-bed at the River Ouse crossing point, which may support qualifying features, such as breeding bittern.

8.2.40 Disturbance from visual intrusion, such as lighting, is also likely to be most relevant if the works are immediately adjacent to an SPA. Temporary construction lighting is likely to be an issue if the works result in the introduction of lighting within close proximity to a part of the European site which is currently unlit. The Order Limits crosses directly over the Humber Estuary SPA/Ramsar site and, therefore, there is potential for visual intrusion.

8.2.41 LSEs of the Project on the Humber Estuary SPA/Ramsar site, regarding disturbance to qualifying features during construction, cannot be screened out and have been taken forward to the Stage 2: Appropriate Assessment.

8.2.42 The Stage 2: Appropriate Assessment in section 9.4 has been informed by noise monitoring data and modelling of the average (LA_{eq}) and, where appropriate, maximum (LA_{max}) construction noise levels for the noisiest activities. This can be seen within **Application Document 6.16 Environmental Statement Chapter 16 Noise and Vibration**.

European sites screened out

8.2.43 The Humber Estuary SAC is designated for a range of aquatic and/or semi-aquatic species, including sea lamprey, river lamprey and grey seal.

8.2.44 Grey seals spend most of their time out at sea feeding on fish and are less likely than common seals (*Phoca vitulina*) to enter rivers (DJF Russell, Sea Mammal Research Unit, 2016). Although they do spend most of their time out at sea, they return to land to rest and can often be seen 'hauled out' on beaches. One of the main haul-out sites for grey seals in the east of the UK is at Donna Nook, which is part of the Humber Estuary SAC (DJF Russell, Sea Mammal Research Unit, 2016) and lies approximately 58.8 km downstream of the Order Limits. As such, grey seal is not considered further in this HRA Report.

8.2.45 Both lamprey species are anadromous and are expected to use the entire continuum of watercourses from the Humber Estuary to the upper reaches of the River Derwent. Qualifying fish from the Humber Estuary SAC can be impacted by underwater sound/vibration, which can either be impulsive or continuous in nature, and can cause a variety of impacts to fish, ranging from severe physical injury (e.g., rupture of the swim bladder), physical damage to the auditory system (e.g., temporary shifts in hearing thresholds) to behavioural changes, such as disruption of migratory behaviours. All lamprey species lack swim bladders and are considered to be low-hearing-sensitivity fish. Generally, they are less susceptible to barotrauma because they detect particle motion rather than sound pressure. No in-channel works are proposed within the Humber Estuary SAC, although a safety boat will be used to aid in the stringing of the overhead line. The River Ouse is considered a busy waterway, and the lower Ouse remains a working river (Great Ouse Rivers Trust, 2022). The short-term use of the safety boat is inconsequential, given the scale of the works and existing volume of boat traffic. Likely significant effects as a result of this impact pathway can therefore be screened out.

8.2.46 Thorne and Hatfield Moors SPA, designated for breeding nightjar, lies approximately 2.7 km from the Order Limits, which is at the edge of the typical 3 km foraging range for nightjar (British Trust for Ornithology (BTO), 2017). Foraging nightjars have not been detected during the nightjar surveys undertaken for the Project, as described in **Application Document 6.9.A2 Environmental Statement Appendix 9.2 Ornithology Baseline Report**. As nightjar has not been detected during surveys, and the Project is located close to the edge of the typical foraging range for this species and contains suboptimal foraging habitat, LSE can therefore be screened out for Thorne and Hatfield Moors SPA, in relation to this impact pathway during construction.

Spread of Invasive Non-Native Species

Summary of potential impact pathways

8.2.47 A potential impact pathway from the spread of INNS has been identified on the following European sites:

- Humber Estuary SAC;
- Humber Estuary SPA; and
- Humber Estuary Ramsar site.

European sites screened in

8.2.48 None of the European sites with a potential impact pathway with the Project have been screened in.

European sites screened out

8.2.49 **Application Document 7.3 Register of Environmental Actions and Commitments** includes the following information relevant to the control and management of the spread of INNS:

- E05: To control the spread of invasive non-native species (INNS) of plants, in accordance with the Wildlife and Countryside Act 1981 (HM Government, 1981) any plant or machinery that has been used in areas infested with INNS (both terrestrial and aquatic), such as Japanese knotweed (*Reynoutria japonica*) and Himalayan balsam (*Impatiens glandulifera*), will be thoroughly cleaned. Water used to clean vehicles will be controlled to prevent the spread of the plant (through seeds, rhizomes or fragments, for example).
- E06: Appropriate exclusion zones will be demarcated and enforced around areas of INNS (informed by an up-to-date site walkover) to avoid spread or propagation (through seeds, rhizomes, or fragments, etc.). An Invasive and Non-Native Species Management Plan will be produced pre-construction and complied with at the applicable phase, to detail required eradication methods (where necessary) for INNS present on-site and biosecurity controls to prevent spread.

8.2.50 Moreover, there are several legislative instruments relating to INNS. The purpose of this legislation is to prevent and reduce the negative economic and environmental impacts of these species. Key legislation includes the Wildlife and Countryside Act 1981 (HM Government, 1981) and The Invasive Alien Species (Enforcement and Permitting) Order 2019 (as amended) (IASO) (HM Government, 2019).

8.2.51 Taken together, the relevant legislation makes it an offence to plant or otherwise cause to grow (including allowing to spread) listed species in the wild. If transported off-site, there is a duty of care with regard to the disposal of any part of the plant that may facilitate establishment in the wild and cause environmental harm (as per the Environmental Protection Act 1990 (HM Government, 1990)).

8.2.52 Therefore, appropriate biosecurity measures will be implemented during works carried out during construction phase of the Project, to prevent the spread of INNS, irrespective of whether there are European sites in the vicinity. Overall, LSEs can be therefore screened out during construction from this impact pathway.

8.3 Operational and Maintenance Phase

Loss of Functionally Linked Land

Summary of potential impact pathways

8.3.1 A potential impact pathway from loss of FLL has been identified on the following European sites:

- Humber Estuary SPA;
- Humber Estuary Ramsar site; and
- Thorne and Hatfield Moors SPA.

European sites screened in

8.3.2 As set out in **Application Documents 6.8 Environmental Statement Chapter 8 Ecology** and **6.9 Environmental Statement Chapter 9 Ornithology**, much of the land within the Order Limits is predominantly arable, which is suitable for use by several qualifying SPA species of the Humber Estuary SPA/Ramsar site, a number of which have been recorded from ornithological surveys.

8.3.3 With qualifying features being recorded during field surveys, LSEs on the Humber Estuary SPA/Ramsar site, due to loss of FLL habitat during operation, cannot be screened out and have been taken forward to the Stage 2: Appropriate Assessment.

European sites screened out

8.3.4 Thorne and Hatfield Moors SPA is designated for breeding nightjar (Natural England, 2014). The Supplementary Advice on Conservation Objectives (SACO) for the Thorne and Hatfield Moors SPA (Natural England, 2019) indicates that the location of feeding areas supporting nightjar is often poorly understood. However, monitoring at other European sites suggests that nightjar focus on particularly rich feeding sites, often avoiding superficially similar habitats closer to their breeding sites. Radio tracking studies of nightjar in the SPA indicate that birds typically forage within 3 km of the SPA boundary, with only few individuals travelling further off-site (up to 5 km). Baseline surveys monitored potentially suitable habitat for foraging nightjar that intersects the Order Limits and their environs within 5 km of the SPA between June to July 2022 and June to July 2024 (see **Application Document 6.9 Environmental Statement Chapter 9 Ornithology**).

8.3.5 At its closest, Thorne and Hatfield Moors SPA lies approximately 2.7 km from the Order Limits, which is just within the typical 3 km range discussed above; however, no foraging nightjars have been detected during the nightjar surveys. As nightjar has not been detected during surveys and the Project is: 1) located close to the edge of the typical foraging range for this species; 2) contains sub-optimal foraging habitat; and 3) the minimal loss of any such habitat is limited to pylon footprints, LSE can therefore be screened out for Thorne and Hatfield Moors SPA in relation to this impact pathway during operation.

Water Quality

Summary of potential impact pathways

8.3.6 A potential impact pathway from waterborne pollution has been identified on the following European sites:

- Humber Estuary SAC;
- Humber Estuary SPA; and
- Humber Estuary Ramsar site.

European sites screened in

8.3.7 None of the European sites with a potential impact pathway with the Project have been screened in.

European sites screened out

8.3.8 The Environmental Damage (Prevention and Remediation) (England) Regulations 2015 (HM Government, 2015) and The Environmental Permitting (England and Wales) Regulations 2016 (HM Government, 2016) make it an offence to pollute watercourses, irrespective of whether they are European sites or connect to European sites.

8.3.9 Therefore, during operation and maintenance, National Grid has a duty of care to the water environment and to produce and implement plans and procedures to prevent discharge from works entering surface, groundwater, wetlands or coastal waters. This is usually undertaken in the form of an Environmental Management Plan (EMP), which includes measures for the protection of ground and surface waters, pollution prevention measures and an emergency response plan for pollution events.

8.3.10 As such, it is considered that maintenance of the new infrastructure (where required) can be undertaken in a way to prevent pollution to the water environment to ensure no adverse effects from water pollution on any European site. LSE can therefore be screened out for all European sites through this impact pathway.

Airborne Pollution

Summary of potential impact pathways

8.3.11 A potential impact pathway from airborne pollution has been identified on the following European sites:

- Humber Estuary SAC;

- Humber Estuary SPA; and
- Humber Estuary Ramsar site.

European sites screened in

8.3.12 None of the European sites with a potential impact pathway with the Project have been screened in.

European sites screened out

8.3.13 The only source of traffic exhaust emissions anticipated during the operational phase will be those associated with vehicles used for routine maintenance, which will be notably less than those used during construction.

8.3.14 The Project is not anticipated to generate material operational or maintenance traffic once construction is complete. Vehicle movements associated with routine inspection and maintenance are expected to be infrequent, limited in number and negligible in traffic terms (**Application Document 6.14 Environmental Statement Traffic and Transport**).

8.3.15 It is possible to screen out the need to assess traffic emissions using recognised screening criteria, as stated in the Land-Use Planning & Development Control: Planning for Air Quality guidance (Institute of Air Quality Management, 2017). Table 6.2 of this guidance includes a list of 'indicative criteria to proceed to an air quality assessment, two of which are a change of light duty vehicle (LDV) of more than 500 Annual Average Daily Traffic (AADT) and a change of heavy-duty vehicle (HDV) of more than 100 AADT.

8.3.16 On the basis that the volume of operational and maintenance traffic will be notably lower than the volume of construction traffic, and will be below the criteria mentioned above, LSE can be screened out for all European sites through this impact pathway.

Hydrological Changes

Summary of potential impact pathways

8.3.17 A potential impact pathway from hydrological change has been identified on the following European sites:

- Humber Estuary SAC;
- Humber Estuary SPA; and
- Humber Estuary Ramsar site.

European sites screened in

8.3.18 None of the European sites with a potential impact pathway with the Project have been screened in.

European sites screened out

8.3.19 The sensitivity of the Humber Estuary SAC/SPA/Ramsar site to hydrological changes is described in paragraphs 8.2.24 to 8.2.25 and applies equally to the operational phase.

8.3.20 Hydrological risks associated with the operational and maintenance phases of the Project, are considered to be the same as for the construction phase (albeit to a lesser degree), and the relevant legislation still applies.

8.3.21 Therefore, during operation and maintenance, National Grid has a duty of care to the water environment, and to produce and implement plans and procedures to prevent discharge from works entering surface, groundwater, wetlands or coastal waters. This is usually undertaken in the form of an EMP, which includes measures for the protection of ground and surface waters, pollution prevention measures and an emergency response plan for pollution events.

8.3.22 As such, it is concluded that the operation and maintenance of the Project will not result in LSEs arising from hydrological changes on the Humber Estuary SAC/SPA/Ramsar site.

8.3.23 During the operational phase, there will be no residential requirement for potable water. Since no additional water supplies beyond existing consents will be required to meet the water demand in the operational phase, there is no potential for the Project to reduce water supply to the Humber Estuary SAC/SPA/Ramsar site in the operational phase and, therefore, the LSE is screened out.

Disturbance of Qualifying features

Summary of potential impact pathways

8.3.24 A potential impact pathway from disturbance to qualifying features has been identified on the following European sites:

- Humber Estuary SAC;
- Humber Estuary SPA;
- Humber Estuary Ramsar site; and
- Thorne and Hatfield Moors SPA.

European sites screened in

8.3.25 None of the European sites with a potential impact pathway with the Project have been screened in.

European sites screened out

8.3.26 Once the Project is operational, there will be no requirement for day-to-day presence of people, and the infrastructure does not produce sounds that would result in the disturbance of birds. The only potential for disturbance would therefore be during maintenance. It is impossible to forecast exactly when maintenance crews may need to visit parts of the site, or how often. However, maintenance visits are likely to be infrequent and for short periods and will be much smaller in scale than construction. Given the area is an active agricultural landscape with tractors, agricultural workers and other mobile plant present as a matter of course, it is considered that maintenance crews and activities would not constitute a material change to this background level of activity. LSEs as a result of operation or maintenance on the European sites above are therefore screened out from this impact pathway.

Barriers to Movement

Summary of potential impact pathways

8.3.27 A potential impact pathway in the form of barriers to the movement of qualifying features between their European sites and FLL, has been identified on the following European sites:

- Humber Estuary SPA;
- Humber Estuary Ramsar site; and
- Thorne and Hatfield Moors SPA.

European sites screened in

8.3.28 As discussed in section 7, new structures can potentially affect the ability of species to move across terrestrial landscapes by adding obstacles, impacting connectivity with FLL and increasing habitat fragmentation.

8.3.29 Since 2022, a suite of ornithological surveys has been undertaken along the length of the Order Limits to provide supporting information for this HRA Report.

8.3.30 Ornithological field surveys have recorded qualifying features of the Humber Estuary SPA/Ramsar site within the Order Limits, indicating the presence of FLL. Therefore, LSEs on the Humber Estuary SPA/Ramsar site, due to barriers to movement, cannot be screened out and have been taken forward to the Stage 2: Appropriate Assessment.

European sites screened out

8.3.31 Thorne and Hatfield Moors SPA is designated for supporting a breeding population of nightjar and lies 2.70 km from the draft Order Limits. Baseline surveys monitored potentially suitable habitat for foraging nightjar that intersects the Order Limits and their environs within 5 km of the SPA between June to July 2022 and June to July 2024 (see **Application Document 6.9 Environmental Statement Chapter 9 Ornithology**).

8.3.32 The ability of the species to safely and successfully move between feeding and nesting areas using flight-lines and movement routes is critical to their breeding success, and to adult fitness and survival. Radio tracking studies of nightjar in the SPA indicate that birds typically forage within 3 km of the SPA boundary, with only few individuals travelling further off-site (up to 5 km). At its closest, the SPA lies approximately 2.7 km from the Order Limits, which is just within the typical 3 km range.

8.3.33 The Project is located close to the edge of the typical foraging range for this species; however it contains suboptimal foraging habitat, and no nightjar were observed during surveys. Therefore, LSEs on Thorne and Hatfield Moors SPA have been screened out for this impact pathway.

Injury/Mortality

Summary of potential impact pathways

8.3.34 A potential impact pathway from injury/mortality has been identified on the following European sites:

- Humber Estuary SPA;
- Humber Estuary Ramsar site; and
- Thorne and Hatfield Moors SPA.

European sites screened in

8.3.35 The Order Limits and proposed overhead line cross FLL the Humber Estuary SPA and Ramsar site and FLL. Qualifying features of these sites were recorded within the Order Limits.

8.3.36 Earth wires are thought to be responsible for a much higher rate of collisions than the thicker, often bundled conductor wires. Earth wires are harder for birds to see, being thinner in diameter and typically positioned at the top of the wire array. Birds trying to gain height to avoid the larger more visible conductor wires may fail to see earth wire.

8.3.37 Since 2022, a suite of ornithological surveys has been undertaken along the length of the Order Limits. Cumulative survey effort, at all vantage points, of 2,380.25 hours recorded 103,910 flights with no observations of bird collisions with the existing overhead lines although a near miss of the earth wire by a single Bewick's swan was observed.

8.3.38 Ornithological filed surveys have recorded qualifying features of the Humber Estuary SPA/Ramsar site within the Order Limits indicating the presence of FLL and potential for birds to transit through the Order Limits between European sites and FLL. Therefore, LSEs on the Humber Estuary SPA/Ramsar site due to injury/mortality cannot be screened out and have been taken forward to the Stage 2: Appropriate Assessment.

European sites screened out

8.3.39 Thorne and Hatfield Moors SPA is designated for supporting a breeding population of nightjar and lies 2.70 km from the Order Limits. Baseline surveys monitored potentially suitable habitat for foraging nightjar that intersects the Order Limits and their environs within 5 km of the SPA between June to July 2022 and June to July 2024 (see **Application Document 6.9 Environmental Statement Chapter 9 Ornithology**).

8.3.40 Radio tracking studies of nightjar in the SPA indicate that birds typically forage within 3 km of the SPA boundary, with only few individuals travelling further off-site (up to 5 km). At its closest, the SPA lies approximately 2.7 km from the Order Limits which is just within the typical 3 km range.

8.3.41 The Project is located close to the edge of the typical foraging range for this species, contains suboptimal foraging habitat and no nightjar were observed during surveys. The collision risk of nightjar is likely to be negligible as this species is of a small size, is highly manoeuvrable and has enhanced low light vision. Therefore, LSEs on Thorne and Hatfield Moors SPA have been screened out for this impact pathway.

8.4 Stage 1 Screening Outcome

8.4.1 For birds, Ramsar site criteria features and SPA Qualifying features and winter assemblage features (including considered assemblage component species) with low levels of distribution and abundance (as detailed within **Application Document 9.6.A2 Environmental Statement Appendix 9.2 Ornithology Baseline Report)** are ruled out from LSE associated with all pathways.

8.4.2 Table 8.1 provides a summary of those European sites which have been screened in and therefore taken through to the Stage 2: Appropriate Assessment, the impact pathway it relates to, and during which Project phase.

Table 8.1 – Summary of Stage 1: Screening

Impact pathway	Project phase	Relevant European sites	Screening outcome
Loss of FLL	Construction and operation	Humber Estuary SPA/Ramsar Site	**Screened in** – LSE cannot be ruled out for the following qualifying features (including considered assemblage component species): • Non-breeding pink-footed goose; • Non-breeding greylag goose; • Non-breeding golden plover; • Non-breeding lapwing; • Non-breeding curlew; • Non-breeding mallard; • Non-breeding teal; • Non-breeding wigeon; • Non-breeding bittern; • Non-breeding little egret; • Non-breeding shelduck; • Non-breeding snipe; and • Breeding marsh harrier. Stage 2: Appropriate Assessment required.
Airborne pollution – dust deposition	Construction	Humber Estuary SAC/SPA/Ramsar Site	**Screened in** – LSE resulting from dust deposition cannot be ruled out for any supporting habitats and associated qualifying features. Stage 2: Appropriate Assessment required.

Impact pathway	Project phase	Relevant European sites	Screening outcome
Disturbance of qualifying features	Construction	Humber Estuary SPA/Ramsar Site	**Screened in** – LSE cannot be ruled out for the following qualifying features (including considered assemblage component species): • Non-breeding pink-footed goose; • Non-breeding greylag goose; • Non-breeding golden plover; • Non-breeding lapwing; • Non-breeding curlew; • Non-breeding mallard; • Non-breeding teal; • Non-breeding wigeon; • Non-breeding bittern; • Non-breeding little egret; • Non-breeding shelduck; • Non-breeding snipe; • Non-breeding green sandpiper; and • Breeding marsh harrier. Stage 2: Appropriate Assessment required.
Barriers to movement	Operation	Humber Estuary SPA/Ramsar Site	**Screened in** – LSE cannot be ruled out for the following qualifying features (including considered assemblage component species): • Non-breeding pink-footed goose; • Non-breeding golden plover; • Non-breeding lapwing; • Non-breeding curlew; • Non-breeding greylag goose; • Non-breeding mallard; • Non-breeding shelduck; and • Breeding marsh harrier. Stage 2: Appropriate Assessment required.

Impact pathway	Project phase	Relevant European sites	Screening outcome
Injury/mortality	Operation	Humber Estuary SPA/Ramsar Site	**Screened in** – LSE cannot be ruled out for the following qualifying features (including considered assemblage component species): • Non-breeding pink-footed goose; • Non-breeding golden plover; • Non-breeding lapwing; • Non-breeding curlew; • Non-breeding greylag goose; • Non-breeding mallard; • Non-breeding shelduck; and • Breeding marsh harrier. Stage 2: Appropriate Assessment required.

8.5 In-Combination Assessment

8.5.1 This HRA screening assessment adopts a strong precautionary principle; if a potential effect pathway is identified between the Project and a European site, then that site is taken through to AA. This ensures all effects are captured, including *de minimis* effects.

9. HRA Stage 2: Assessment to Inform Appropriate Assessment

9.1 Introduction

9.1.1 This section provides information to inform the Stage 2: Appropriate Assessment for impact pathways that were not ruled out during Stage 1: Screening and were accordingly deemed to require further assessment.

9.1.2 The following sections consider designated European sites that could not be screened out for LSEs. Best available scientific evidence has been reviewed to determine whether Project activities will have an Adverse Effect on Site Integrity (AEoI) on a European site, in view of the site's conservation objective(s). The assessment takes into account any proposed mitigation which is to be secured in reaching a conclusion on whether an AEoI from the impact pathway (either alone or in combination with other plans or projects) can be ruled out.

9.1.3 Those potential impacts carried through to Stage 2: Appropriate Assessment are described below.

Construction phase

- Loss of FLL;
- Airborne pollution (specifically dust deposition); and
- Disturbance of qualifying features.

Operational phase

- Loss of FLL;
- Barriers to movement of qualifying features; and
- Injury/mortality of qualifying features.

9.1.4 These impact pathways and the European sites and qualifying features subject to AA are shown in Table B.1, located in Appendix B, and are assessed below.

9.2 Construction

Loss of Functionally Linked Land

Humber Estuary SPA/Ramsar site

9.2.1 During construction of the Project temporary habitat losses affecting FLL across the Humberhead Levels will arise:

- Within the Order Limits due to clearance of habitats to make way for haul roads and other construction traffic access routes, working areas, storage areas and site

compounds, potentially affecting habitats used by Humber Estuary SPA qualifying features; and

- Up to 500 m either side of the Order Limits due to disturbance of qualifying features that occur within the surrounding arable landscape.

9.2.2 The effects of direct temporary loss of FLL and indirect loss via disturbance are of a similar nature in terms of loss of functional use for foraging qualifying features, however all aspects associated with visual/noise disturbance are assessed within the subsequent Disturbance of Qualifying Features section.

9.2.3 The numbers of Humber Estuary SPA qualifying features potentially affected by loss of FLL have been determined from the peak and cumulative counts of birds occurring within FLL up to 500 m from the Order Limits that equal or exceed one percent of the Humber Estuary SPA population. These are summarised below for each species affected. Detailed narrative is provided in **Application Document 9.6.A2 Environmental Statement Appendix 9.2 Ornithology Baseline Report** and the supporting figures **A.9.2.25- A.9.2.49** that show the distribution and numbers of each species.

9.2.4 All other qualifying features and winter assemblage features are ruled out from effects associated with this pathway due to their low levels of distribution and abundance as detailed within **Application Document 9.6.A2 Environmental Statement Appendix 9.2 Ornithology Baseline Report**.

Non-breeding pink-footed goose

9.2.5 Widespread foraging was recorded either side of the River Ouse, principally between Broomfleet Tileworks and Luddington. Exceedance of one percent (273 birds) of the Humber Estuary SPA population occurred at locations close to Broomfleet Tileworks (peak count 2,000 birds), Adlingfleet (peak count 3,000 birds) and Luddington (peak count 1,000 birds) between October and February, with repeated occurrences over multiple years adjacent to Broomfleet Tileworks and near Adlingfleet. Flight activity was widespread, peaking between Ellerker and Luddington at all heights with some flight at high altitude over Yorkshire Wolds.

Non-breeding greylag goose

9.2.6 Greylag geese occurred almost exclusively between Broomfleet and Garthorpe, exceeding one percent (22 birds) of the Humber Estuary SPA population at Broomfleet Tileworks (peak count 234 birds), farmland west of the tileworks (peak count 600 birds), Ousefleet and Blacktoft Sands (peak count 400 birds). Peak flight activity occurred between Broomfleet Tileworks and the River Ouse with low levels of flight activity elsewhere.

Non-breeding golden plover

9.2.7 Golden plover occurred sparsely between Ellerker and Keadby, peak counts from surveys did not reach one percent threshold (307 birds) of the Humber SPA population, although RSPB reported numbers up to 520 birds foraging near Luddington.

9.2.8 More widely either side of the Rivers Ouse and Humber up to 10,000 birds were present near Brough and 450 birds recorded near Island Farm, although these were more than 500 m from the Order Limits.

Non-breeding lapwing

9.2.9 Lapwing was recorded extensively between Ellerker and Luddington, peak counts exceeding one percent (227 birds) of the Humber SPA population only at Luddington, where a peak of 450 birds was recorded during surveys (RSPB reported up to 940 birds here).

9.2.10 Other occurrences numbered up to 650 birds at locations either side of the River Ouse, albeit more than 500 m from the Order Limits.

Non-breeding curlew

9.2.11 Within 500 m of the Order Limits all records of curlew occurred between Ellerker and Garthorpe. Peak counts equalled or exceeded one percent (32 birds) of the Humber SPA population only on the banks of the River Ouse (56 and 37 birds). Larger counts were recorded further from the Order Limits, but always within 500 m of the River Ouse.

Non-breeding mallard

9.2.12 Mallard was widespread between Ellerker and Garthorpe. There were peak counts equalling or exceeding one percent (23 birds) of the Humber Estuary SPA population during daytime surveys of up to 24 birds at Broomfleet Tileworks, 47 birds on the River Ouse and up to 28 birds on a pond near Ellerker. Elsewhere this species was recorded feeding in small numbers close to drains and ditches across farmland

Non-breeding teal

9.2.13 Teal occurred exclusively at watercourses or pools, with peak counts equalling or exceeding one percent (23 birds) of the Humber Estuary SPA population at Broomfleet Tileworks (64 birds), Oxmardyke Washlands (29 birds) and 159 birds at the River Ouse, where the species occurred throughout the survey period.

Non-breeding wigeon

9.2.14 Wigeon showed a very similar distribution to teal, with peak counts at Broomfleet Tileworks (127 birds) and the River Ouse (123 birds) being the only locations where one percent of the Humber SPA population (50 birds) was exceeded.

Non-breeding bittern

9.2.15 Bittern was not recorded during the non-breeding surveys. Observations by RSPB staff indicate presence of an occasional foraging bird at Broomfleet Tileworks, this bird having commuted to the tileworks from within Blacktoft Sands RSPB Reserve.

Non-breeding little egret

9.2.16 Little egret occurred predominantly at Broomfleet Tileworks (peak count five birds) and the River Ouse (peak count one bird), with foraging singles and small groups up to four birds recorded near Ellerker, Blacktoft, Ousefleet and Garthorpe. One percent of the Humber Estuary SPA population is two birds, this threshold being exceeded at these locations, except within the Humber Estuary SPA site boundary.

Non-breeding shelduck

9.2.17 Shelduck occurred in small numbers at Broomfleet Tileworks (peak three birds), the River Ouse (peak nine birds) and occasionally on farmland either side of the River Ouse but did not exceed one percent of the Humber Estuary SPA population (44 birds) at any location.

Non-breeding snipe

9.2.18 Peak counts of one bird were recorded at Broomfleet Tileworks and three birds at the River Ouse. Several foraging and loafing records were recorded northwest of Garthorpe and at several locations north of the River Ouse including Broomfleet beck and other small watercourses. A resting group of seven birds was recorded close to Ellerker on one occasion. All counts of one or more equal or exceed one percent of the Humber Estuary SPA population.

Breeding marsh harrier

9.2.19 Marsh harriers were recorded engaging in widespread foraging activity over farmland either side of the Rivers Ouse and Humber; however, there were no breeding locations within the Humber Estuary SPA that are within 500 m of the Order Limits. Therefore, only foraging activity by birds nesting within the designated site could be affected during the construction phase of the Project.

9.2.20 Foraging activity was observed by individual birds during the breeding season near Brantingham Dale, Ellerker and Garthorpe. All such records represent more than one percent of the Humber Estuary SPA population, however Brantingham Dale is sufficiently distant from the designated site for these birds to have originated from nesting sites north of the Humber Estuary.

Mitigation

9.2.21 Environmental appraisal has been an integral part of the Project design from the outset, which has meant that the Project has been able to avoid environmentally sensitive features as far as reasonably practicable. National Grid has also embedded measures into the design of the Project to avoid or reduce significant effects that may otherwise be experienced during construction and operation of the Project.

9.2.22 Embedded measures are those that are intrinsic to and built into the design of the Project; these are presented in **Application Document 7.3 Register of Environmental Actions and Commitments**. Embedded measures of relevance to the AA are:

- EDM01: Sensitive routeing and siting was undertaken to develop the proposed overhead line alignment and draft Order Limits. The routeing and siting avoids and reduces, as far as practicable, impacts on identified receptors, in line with the Overarching National Policy Statement for Energy (EN-1) (Department for Energy Security and Net Zero, 2025) and National Policy Statement for Electricity Networks Infrastructure (EN-5) (Department for Energy Security and Net Zero, 2025) as well as the Holford Rules (National Grid, 1959).
- EDM03: Where possible, the proposed overhead line has been designed to be parallel to or close parallel with the existing overhead lines. Route Sections where close parallel and pylon synchronicity has been achieved, considering constraints present along the existing overhead lines as well as technical complexity, include:

- Sections within Route Sections A and B to reduce effects on the Yorkshire Wolds Important Landscape Area and potential effects of collision risk, habitat loss and disturbance of interest features of the Humber Estuary Special Protection Area (SPA) and Ramsar site; and
- Route Section D to reduce effects on the Isle of Axholme Area of Special Historic Landscape Interest.

- EDM05: The design includes strategically located and optimised construction access tracks along the Project alignment to reduce the impact on the local highway network. This includes the inclusion of largely continuous construction access tracks, breaking only as a result of major roads, railways, areas of environmental constraints and/or major watercourses.
- EDM06: Construction effects have been designed out/ minimised as far as practicable through, for example, minimising land-take/habitat loss and locating construction access tracks and temporary construction compounds/ material storage areas outside of ecologically sensitive sites/ habitats (such as statutory and non-statutory designated sites, priority habitats and wetlands).

9.2.23 One of the key factors in relation to the Project is that the construction works will inherently be temporary. For example, the pylon foundations, pylon construction and stringing will be undertaken between 2028 and 2031. Due to the linear nature of the Project, construction activities will be transient, moving along the length of the working area over time. Therefore, the works on specific sections of the proposed overhead line route (including specific pylons and line stringing between them) will be phased, and much shorter than the time allotted for a given task in the overall construction programme.

9.2.24 While some loss of FLL from construction activities to qualifying SPA/Ramsar site features will inevitably arise, this will occur only along relatively short subsections and for short durations at any given point in time. Given this, it is important to highlight at the outset that any loss of FLL during construction will not result in ‘sustained’ or ‘continuing’ redistribution of qualifying features, since any disturbed individuals would have the opportunity to recommence foraging along a particular section of the overhead line route once construction works have moved on.

9.2.25 The key mitigation measure to ensure negligible effects on birds using FLL is the provision of alternative arable farmland for use by pink-footed goose, golden plover, lapwing and curlew, within or adjoining the Order Limits.

9.2.26 Alternative foraging habitat within arable farmland has been provided in Route Section B as illustrated on **Application Document 6.4.F1 Environmental Statement Figure 4.1 Proposed Project Design**. This is detailed in **Application Document 7.3 Register of Environmental Actions and Commitments** commitment reference ON14:

- This land has been provided for use by pink-footed goose, golden plover, lapwing and curlew and has been secured exclusively for the creation and management of this supporting habitat, covering 46ha of farmland under an adequate, guaranteed inter-annual cropping regime. The habitat has been provided within the geographic range currently utilised by the Humber Estuary SPA/Ramsar site qualifying species to ensure that birds will use this new foraging resource. Since the Project will be constructed in phases (with different areas of potential FLL being subject to disturbance at different points in time), this supporting habitat would be made available over the entire construction phase of the Project. and,

as a maximum, for the lifetime of the Project to account for any potential loss of foraging habitat associated with displacement of birds from the immediate surrounds of the proposed overhead line during operation.

AEoI Conclusion

9.2.27 The Conservation Objectives for the Humber Estuary SPA are to 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.

9.2.28 This HRA Report concludes that with the adoption of relevant mitigation, the effects associated with loss of FLL will not adversely affect the integrity of the Humber Estuary SPA Conservation Objectives for the following qualifying features (including considered assemblage component species):

- Non-breeding pink-footed goose;
- Non-breeding greylag goose;
- Non-breeding golden plover;
- Non-breeding lapwing;
- Non-breeding curlew;
- Non-breeding mallard;
- Non-breeding teal;
- Non-breeding wigeon;
- Non-breeding bittern;
- Non-breeding little egret;
- Non-breeding shelduck;
- Non-breeding snipe; and
- Breeding marsh harrier.

9.2.29 This HRA Report also concludes that with the adoption of relevant mitigation, the effects associated with loss of FLL will not adversely affect the Humber Estuary Ramsar site features under Criterion 5 – Bird Assemblages of International Importance: Wintering waterfowl, and Criterion 6 – Bird Species/Populations Occurring at Levels of International Importance.

Airborne Pollution

Humber Estuary SAC/SPA/Ramsar site

Dust deposition

9.2.30 Habitat Regulation Assessment screening identified that while there are no construction compounds within 250 m, access tracks for construction traffic will be installed in close proximity to the SAC/SPA/Ramsar site, and two suspension and tension pylons will be constructed either side of the River Ouse, all of which fall within the 250 m dust impact zone. Several Primary Access Routes (PARs) also run within 250 m of the Humber Estuary SAC/SPA/Ramsar site. Dust released from the wheels of HGVs and inadequately stored loads could also be released onto sensitive ecological receptors. **Application Document 7.3 Register of Environmental Actions and Commitments** includes a range of mitigation measures that will reduce the potential for dust release in the construction phase of the Project, including:

- DE1: The Project will be run in compliance with all relevant legislation, consents and permits including the limitations and requirements set out in the DCO.
- GG01: The final versions of the outline environmental management plans will be submitted for approval in accordance with the requirements, as secured by **Application Document 3.1 Draft Development Consent Order** prior to commencement of development and will reflect the final construction methodologies produced by the Main Works Contractor(s). The following will be produced prior to construction:
  - Code of Construction Practice (CoCP);
  - Construction Traffic Management Plan (CTMP);
  - Soil Management Plan (SMP);
  - Public Rights of Way Management Plan;
  - Cultural Heritage Management Plan;
  - Framework Construction Surface Water Management Plan (CSWMP);
  - Noise and Vibration Management Plan;
  - Landscape and Ecology Management Plan (LEMP); and
  - Archaeological Written Scheme of Investigation (WSI).

  All construction works will be undertaken in general accordance with these plans and all referenced subordinate plans.
- GG02: The Main Works Contractor(s) will undertake site inspections to check conformance to the measures set out within each of the management plans and their subordinate plans as set out within GG01.
- GG04: Construction workers will undergo training to increase their awareness of environmental issues as applicable to their role on the Project as set out within **Application Document 7.2 Outline Code of Construction Practice**.
- GG10: As far as reasonably practicable and safe to do so, any activity carried out or equipment located within a construction compound that may produce dust,

noise, vibration and lighting emissions, will be located away from sensitive receptors such as residential properties or designated ecological sites.

- GG13: Materials and equipment will not be moved or handled unnecessarily. When loading and unloading materials from vehicles, including excavated materials, drop heights will be limited, where practicable.
- GG20: Wheel washing facilities will be provided at each compound and intermittently along construction access tracks. Road sweepers will be deployed on public roads where necessary to prevent excessive dust or mud deposits. Dry sweeping of large areas will be avoided.
- GG21: Earthworks and stockpiled soil will be protected by covering, seeding or using water suppression.
- GG30: The construction works area will be reinstated to pre-existing conditions as far as reasonably practical in line with a Soil Management Plan and the Department for Environment, Food and Rural Affairs (Defra) Code of Construction Practice for the Sustainable Use of Soils on Construction Sites (Defra, 2009). This will include a commitment to develop and comply with the measures set out within an Aftercare Management Plan (including the aftercare period) prior to the completion of construction.
- AQ04: Monitoring. Daily on-site and off-site inspection will be undertaken, where Receptors (including roads) are nearby, to monitor dust, record inspection results. The information collected from these inspections will be compiled within a log, which will be made available to the local authority on request. This will include regular dust soiling checks of surfaces such as street furniture, cars, and windowsills within 100 m of the site boundary, with cleaning to be provided if necessary. The inspection log will be made available to the local authority on request. There will be an increase in frequency of site inspections by the person accountable for air quality and dust issues on-site when activities with a high potential to produce dust are being carried out and during prolonged dry or windy conditions. Dust deposition, dust flux, or real-time PM10 continuous monitoring locations will be discussed with the local authority, if required. Where possible, baseline monitoring will commence at least three months before work commences on-site or, if it is a large site, before work on a phase commences.
- AQ05: Preparing and Maintaining the Site. Solid screens or barriers will be erected around dusty activities, where required, that are at least as high as any stockpiles on-site. Specific activities will be fully enclosed where there is a high potential for dust production, and the activity is ongoing for an extensive period. Runoff of water or mud will be avoided where possible. Site fencing, barriers and scaffolding will be kept clean using wet methods. Materials that have the potential to produce dust from site will be removed as soon as possible, unless being re-used on-site. If they are being re-used on-site, they will be covered as described below. Stockpiles will be covered, seeded or fenced to prevent wind whipping (where needed and depending on duration).
- AQ06: Operating vehicle/machinery and sustainable travel. A maximum speed limit will be imposed on construction access tracks and work areas. For longer length of construction access tracks, these speeds may be increased with suitable additional control measures provided, subject to the approval of the undertaker and with the agreement of the local authority, where appropriate. A Construction Logistics Plan will be produced and complied with to manage the sustainable delivery of goods and materials.

- AQ07: Operations. Suitable dust suppression techniques, such as water sprays or local extraction, will be fitted to or used in conjunction with, cutting, grinding or sawing equipment. There will be an adequate water supply on the site for effective dust/particulate matter suppression/mitigation, using non-potable water where possible and appropriate. Enclosed chutes and conveyors and covered skips will be used, where reasonably practicable. Drop heights from conveyors, loading shovels, hoppers and other loading or handling equipment will be minimised and fine water sprays will be used on such equipment wherever appropriate. It will be ensured that equipment will be readily available on-site to clean any dry spillages, and spillages will be cleaned up as soon as reasonably practicable after the event using wet cleaning methods.
- AQ09: Construction. Scabbling (roughening of concrete surfaces) will be avoided if possible. Sand and other aggregates will be stored in bunded areas and will not be allowed to dry out, unless this is required for a particular process, in which case appropriate additional control measures will be in place. Fine powder materials will be delivered in enclosed tankers and stored in silos with suitable emission control systems to prevent escape of material and overfilling during delivery. For smaller supplies of fine powder materials, bags will be sealed after use and stored appropriately to prevent dust.

9.2.31 Overall, **Application Document 7.3 Register of Environmental Actions and Commitments** includes proven methods that mitigate potential dust impacts to the Humber Estuary SAC/SPA/Ramsar site. These are particularly important because they will reduce dust impacts on these European sites, which are not covered by other pieces of environmental legislation.

AEoI Conclusion

9.2.32 The Conservation Objectives for the Humber Estuary SAC are to 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 features;
- The structure and function (including typical species) of qualifying natural habitats;
- The structure and function of the habitats of qualifying features;
- The supporting processes on which qualifying natural habitats and habitats of qualifying features rely;
- The populations of qualifying features; and
- The distribution of qualifying features within the site.

9.2.33 The Conservation Objectives for the Humber Estuary SPA are to 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.

9.2.34 This HRA Report concludes that with the adoption of relevant mitigation, the effects associated with dust deposition will not adversely affect the integrity of the Humber Estuary SAC/SPA Conservation Objectives Conservation Objectives for any qualifying features.

9.2.35 Dust deposition will not adversely affect the Humber Estuary Ramsar site features under Criterion 1 - natural wetland habitats that are of international importance: Near natural estuary with component habitats, specifically dune systems and humid dune slacks, estuarine waters, intertidal mud and sand flats, saltmarshes, and coastal brackish/saline lagoons, Criterion 5 – Bird Assemblages of International Importance: Wintering waterfowl, and Criterion 6 – Bird Species/Populations Occurring at Levels of International Importance.

Disturbance of Qualifying Features

Humber Estuary SPA/Ramsar site

9.2.36 Depending on its location, any disturbance of qualifying features occurring within the construction phase of the Project effectively has the potential to result in the temporary loss of usable habitat within the SPA/Ramsar site boundary. Therefore, disturbance and temporary habitat loss impacts are considered together in this section and the baseline information presented in paragraphs 9.2.1–9.2.19 is relevant to both impact pathways.

9.2.37 Natural England's Humber Estuary SACO (Natural England, 2023) specifies disturbance from human activity as an important attribute impacting upon designated bird populations and states that the frequency, duration and/or intensity of disturbance affecting key bird behaviours (e.g., foraging, roosting) is to be restricted. Ultimately, any human activity (but particularly noisy construction activities) can affect natural behaviours and, in some cases, the long-term viability of populations. The negative consequences of disturbance may include reduced feeding, increased energy expenditure, abandonment of nest sites and desertion of otherwise suitable habitat parcels. The SACO specifies disturbance as significant (alone or in-combination) if it results in changed local distributions on a continuing basis, changed local abundances on a sustained basis, or reduces the ability of a significant group of birds to reproduce.

9.2.38 One of the key factors in relation to the Project is that the construction works will inherently be temporary. For example, the pylon foundations, pylon construction and stringing will be undertaken between 2028 and 2031. However, due to the linear nature of the Project, construction activities will be transient, moving along the length of the working area over time. Therefore, the works on specific sections of overhead line route (including specific pylons and line stringing between them) will be phased, and much shorter than the time allotted for a given task in the overall construction programme.

9.2.39 Therefore, while some disturbance from construction activities to qualifying SPA/Ramsar site species will inevitably arise, this will occur only along relatively short subsections and for short durations at any given point in time. Given this, it is

important to highlight at the outset that any disturbance associated with the Project will not result in 'sustained' or 'continuing' redistribution of qualifying features, since any disturbed individuals would have the opportunity to recommence foraging along a particular section of the overhead line route once construction works have moved on.

9.2.40 When considering noise/vibration and visual disturbance in relation to SPA/Ramsar site qualifying features, it should be noted that the Project is effectively associated with the following two disturbance 'tiers', based on their location in relation to habitats used by birds:

- Construction works within 500 m of the Humber Estuary SPA/Ramsar site may result in direct noise/vibration/visual disturbance to birds within the designated site boundary. This has been defined spatially to include the most important roosting and foraging locations of birds and supports the core of the qualifying populations. Direct disturbance impacts within the designated site boundary are the primary concern and will be prioritised for mitigation.
- Construction works within the wider arable landscape north and south of the Humber Estuary and River Ouse have the potential to disturb qualifying features outside of the designated site but within 500 m of the works (provided these locations fall within the relevant IRZs for specific bird species). However, any such disturbance is only considered material where it would impact (close to) one percent of the qualifying features population level. Disturbance in FLL, while important, is considered to be of relatively lower importance compared to direct disturbance to the SPA/Ramsar site, as the key species have a large residual extent of arable farmland available into which they can temporarily relocate.

Noise disturbance

9.2.41 The construction of the overhead line will follow a standardised sequence of works to be completed in turn in each phased section of the Project. The highest time-averaged (LA_{eq}) and peak (LA_{max}) noise levels are expected to be associated with the following stages:

- Ancillary works such as temporary drainage installation where required and vegetation clearance;
- Preparation and establishment of temporary access/egress to the works areas, and construction access tracks (including bridges, where applicable), highways works and bellmouths;
- Installation of pylon foundations (pad and column, mini pile, tube pile or bespoke) and erection of pylons;
- Establishment of machine sites for conductor stringing;
- Drone/helicopter for pulling conductor pilot bonds; and
- Removal of construction equipment and reinstatement of ground and restoration of soils.

9.2.42 The assessment of potential construction noise impacts takes account of the pre-construction noise baseline (**Application Document 6.16 Environmental Statement Chapter 16 Noise and Vibration**). This provides important context of the routine LA_{eq} and LA_{max} noisescape experienced by bird receptors, which is considered to be a predictor of bird responses to the forecast noise levels. A multimodal approach to characterising existing baseline noise levels surrounding the Project was taken:

- Use of Defra strategic noise mapping data (Defra, 2024) to identify the LA_{eq} baseline, with additional sample LA_{max} noise level data for arable fields collected for other projects in the wider area;[13] and
- Bespoke noise monitoring was undertaken at locations that are not adequately covered by the Defra mapping (e.g., along the River Ouse crossing).

9.2.43 The results of the baseline surveys indicates that background and average sound levels are relatively low in the majority of the study area, typical of the rural setting in which the majority of the route sits. Higher ambient and background noise levels are experienced close to main transport routes, including roads and railways are located along the Project route.

9.2.44 The 58 dB Lmax buffer distance for percussive piling was calculated at 562 m. The buffer distances were derived using source noise levels adjusted to represent representative maximum noise levels rather than the average sound levels generally reported in BS 5228-1. As there is no fixed relationship between average and maximum sound levels, the adjustment was based on engineering judgement, taking account of the nature and operating characteristics of each activity. Corrections of 5 dB, 10 dB and 15 dB were applied for steady-state activities, intermittent non-percussive ('clanky') activities, and inherently percussive activities respectively. The assessment assumes that standard mitigation measures are implemented and that a 10 dB reduction in source noise levels can be achieved, consistent with the mitigation guidance provided in BS 5228-1. The adjusted source noise levels were then used to calculate the various buffer distances.

9.2.45 A noise disturbance buffer of 500 m was therefore used to assess potential noise effects. This buffer accounts for the calculated 58 dB Lmax buffer for the worst-case scenario using percussive pilling and the further application of specific noise reduction methods already in place in the **Application Document 7.3 Register of Environmental Actions and Commitments**, namely:

- NV01: **Application Document 7.7 Outline Noise and Vibration Management Plan** has been prepared to set out the framework for how noise and vibration will be controlled and managed. The Main Works Contractor(s) will conduct detailed construction noise and vibration assessments to determine whether any additional measures, including site-specific best practicable means (BPM) and monitoring, may be required. A Noise and Vibration Management Plan will be prepared by the Main Works Contractor(s) substantially in accordance with the **Application Document 7.7 Outline Noise and Vibration Management Plan** and submitted for approval by the relevant local planning authority prior to the commencement of construction and updated and managed during the construction phase as appropriate.
- NV02: The Contractor(s) will be required to follow good construction practices (referred to as best practicable means (BPM) as outlined in BS 5228-1 (British Standards Institution, 2009) and BS 5228-2 (British Standards Institution, 2009) to control noise and vibration respectively. BS 5228-1 and BS 5228-2 have Approved Code of Practice status (in England) under the powers conferred by Sections 71(1)(b), (2) and (3) of the Control of Pollution Act 1974 (HM

[13] These data allow comparison with construction LA_{max} noise levels. In practice, rural fields away from roads and rail infrastructure are anticipated to be quiet in general, with LA_{max} noise levels primarily determined by unpredictable events (e.g., farmers using machinery such as tractors, overflying aircraft, etc.). Therefore, there is very little additional value in undertaking additional baseline noise monitoring at these locations.

Government, 1974) as enacted under The Control of Noise (Code of Practice for Construction and Open Sites) (England) Order 2015(HM Government, 2015). Compliance with the good practice noise and vibration requirements stated therein are a statutory obligation under the Control of Pollution Act 1974 (HM Government, 1974).

- NV09: Continuous noisy plant should be housed in acoustic enclosures, where practicable and efficacious.
- NV10: Exhaust silencing and plant muffling equipment will be fitted on all construction vehicles and maintained in good working order.
- NV11: Static plant known to generate significant levels of vibration will be fitted with vibration dampening features.
- NV18: For the construction of pylon foundations, non-percussive piling methods would be used where practicable.
- NV20: If percussive piling is required for pylon foundations near the River Ouse (see also commitment NV18), appropriate control measures to reduce potential effects on the aquatic environment will be identified by the Main Works Contractor(s) and implemented in accordance with Commitments NV01 and NV02.

Visual disturbance

9.2.46 Visual disturbance can arise from staff, plant or structures associated with any of the construction activities, particularly those involving movement, sudden changes in direction or tall structures. It is well documented that visual stimuli are typically associated with disturbance impacts over larger distances than the associated construction noise. Potential visual disturbance is of particular concern in relation to the erection of pylons and stringing of conductors, as both of these construction steps will occur at height and be visible to birds over relatively long distances, and potentially initiate flight from within the SPA/Ramsar sites or FLL.

Disturbance of qualifying features within SPA/Ramsar site boundary

9.2.47 The construction works for the Project have the potential to generate noise/vibration and visual disturbance, resulting in the displacement of birds where the works are undertaken in close proximity to the Humber Estuary SPA/Ramsar site. Construction activities that could affect the SPA/Ramsar site include:

- Construction of the two pylons to the north (4AF77) and south (4AF78) of the River Ouse crossing (shown in **Application Document 6.4.F1 Environmental Statement Figure 4.1 Proposed Project Design**);
- Stringing of conductors between these pylons; and
- Stringing method chosen to cross the River Ouse.

9.2.48 A variety of wintering bird surveys were undertaken to establish the distribution of SPA/Ramsar site qualifying features within and directly adjoining the River Ouse crossing locations (shown in **Application Document 6.9.A2 Environmental Statement Appendix 9.2 Ornithology Baseline Report**). These surveys provided baseline data on the presence of qualifying features, the distribution of which may be impacted through construction activities undertaken for the Project (see Table 9.1).

9.2.49 Disturbance to these species within the boundaries of the Humber Estuary SPA and Ramsar is one of the key threats to the integrity of the European sites. Therefore, mitigation measures are required to avoid adverse effects on the integrity of the SPA/Ramsar site.

Table 9.1 – Peak counts of Humber Estuary SPA qualifying features recorded within the designated site up to 500 m from the River Ouse crossing location

Species	Peak abundance	Type of survey
Curlew	56	Vantage Point
Mallard	47	Vantage Point
Shelduck	9	Wetland bird counts
Greylag goose	120	Wetland bird counts
Teal	93	Wetland bird counts
Wigeon	123	Wetland bird counts
Snipe	1	Wetland bird counts
Green sandpiper	1	Wetland bird counts

9.2.50 The following mitigation measures will be implemented to reduce the potential for noise/vibration and visual disturbance within the SPA/Ramsar site boundary (see **Application Document 7.2 Outline Code of Construction Practice** and **Application Document 7.3 Register of Environmental Actions and Commitments**) these include the following commitment references:

- NV09: Continuous noisy plant should be housed in acoustic enclosures, where practicable and efficacious.
- NV10: Exhaust silencing and plant muffling equipment will be fitted on all construction vehicles and maintained in good working order.
- NV11: Static plant known to generate significant levels of vibration will be fitted with vibration dampening features.
- NV18: For the construction of pylon foundations, non-percussive piling methods would be used where practicable.
- NV20: If percussive piling is required for pylon foundations near the River Ouse (see also commitment NV18), appropriate control measures to reduce potential effects on the aquatic environment will be identified by the Main Works Contractor(s) and implemented in accordance with Commitments NV01 and NV02.
- ON09: To reduce the magnitude and spatial extent of noise and visual disturbance in key areas visual/noise fencing/acoustic barriers will be installed around all relevant construction activities to be determined by the ECoW, at the following locations during key sensitivity periods, prior to the onset of any construction activities at ground level (including site clearance and preparation of working areas as well as the works themselves) within 500 m of the Humber

Estuary SPA/Ramsar site boundary (pylons 4AF76 – 4AF80). The fencing will be in use for the duration of the seasonal presence of the affected qualifying species of the Humber Estuary SPA and Ramsar Site. In all cases, the fencing should be used between and including the last two weeks in September and the end of the first week of April.

- ON10: Ground conditions permitting, non-percussive piling techniques (e.g., augered piling) should be used wherever piling operations are required, as these are associated with much lower noise profiles.
- ON11 In all cases where piling or other noisy operations are required, soft startup of plant should be implemented such that noise levels build gently rather than suddenly. This will be particularly important where percussive piling cannot be avoided and would involve progressively building the piling impact force to the level required rather than starting at the maximum impact force required to complete the works. This will make some allowance for birds and other protected species that are present in the vicinity of the works to adjust to the noise generated during construction.
- ON12: If impact piling is needed for the construction of the four pylon foundations closest to the River Ouse (4AF76 – 4AF79 inclusive), dampening of the hammer or reducing the velocity with which this operates will be adopted to reduce the peak noise emissions from piling activities.
- ON13: Any construction activities occurring at height (e.g., erection of pylons, stringing of conductors and works at the River Ouse crossing) that cannot realistically be mitigated will take place where practicable outside the most sensitive periods for qualifying features. A 12-week window for this activity has been identified between the beginning of August and the End of October, which avoids the breeding period for nesting peregrine on a nearby pylon, the peak numbers of Humber Estuary qualifying species that occur within 500 m of the River Ouse crossing and the onset of inclement winter conditions when any disturbance of foraging birds would have a greater adverse effect on foraging rates and species survival.

9.2.51 **Application Document 7.2 Outline Code of Construction Practice** and **Application Document 7.3 Register of Environmental Actions and Commitments** provide further detail on control and management measures.

Within functionally linked land

9.2.52 A large portion of the Project traverses an open arable landscape, which offers extensive foraging and roosting habitats to qualifying features of the Humber Estuary SPA/Ramsar site. The likelihood of occurrence of significant assemblages of birds under or adjoining the Project depends on species-typical behaviours (e.g., some species, such as pink-footed goose are known to make significant use of arable farmland), as well as other parameters, such as distance to the designated sites and inter-annual cropping regime.

9.2.53 In order to identify the current levels of habitat usage of SPA/Ramsar site qualifying features adjoining the Project, the following combination of survey methodologies was utilised, covering the 2023/24 and 2024/25 wintering periods as detailed in **Application Document 6.9.A2 Environmental Statement Appendix 9.2 Ornithology Baseline Report**.

9.2.54 To identify records that were relevant to the HRA (and of which material disturbance may impact on the integrity of the Humber Estuary SPA/Ramsar site), the following buffers were applied to the mapped bird survey data:

- 500 m noise and visual disturbance zone surrounding the proposed overhead line route and pylon construction areas, as well as the construction compounds; and
- Species-specific IRZs around the Humber Estuary SPA/Ramsar site based on guidance provided by Natural England (Knight, M., 2019).

9.2.55 Only bird records that fell within the 500 m disturbance buffer and the relevant IRZ for a given species were considered further in the assessment in the context of disturbance displacement. Certain individual birds may, on occasion, travel further distances, but the IRZs have been delineated on the basis of encompassing the off-site movements of the core populations of qualifying features. It is the impacts on these core populations that represent a risk to the conservation objectives and integrity of European sites.

9.2.56 A range of additional, non-embedded mitigation measures will be deployed to minimise noise and visual disturbance in the construction phase of the Project on SPA/Ramsar site birds using FLL, (see **Application Document 7.2 Outline Code of Construction Practice** and **Application Document 7.3 Register of Environmental Actions and Commitments**) these include the following commitment references:

- NV09: Continuous noisy plant should be housed in acoustic enclosures, where practicable and efficacious.
- NV10: Exhaust silencing and plant muffling equipment will be fitted on all construction vehicles and maintained in good working order.
- NV11: Static plant known to generate significant levels of vibration will be fitted with vibration dampening features.
- NV18: For the construction of pylon foundations, non-percussive piling methods would be used where practicable.
- NV20: If percussive piling is required for pylon foundations near the River Ouse (see also commitment NV18), appropriate control measures to reduce potential effects on the aquatic environment will be identified by the Main Works Contractor(s) and implemented in accordance with Commitments NV01 and NV02.
- ON09: To reduce the magnitude and spatial extent of noise and visual disturbance in key areas, visual/noise fencing/acoustic barriers will be installed around all relevant construction activities to be determined by the ECoW, at the following locations during key sensitivity periods, prior to the onset of any construction activities at ground level (including site clearance and preparation of working areas as well as the works themselves) within 500 m of the Humber Estuary SPA/Ramsar site boundary (pylons 4AF76 – 4AF80); where works pass the southern edge of Broomfleet Tileworks, as far as Staddlethorpe Broad Lane (pylons 4AF62 – 4AF70); west of Garthorpe (pylons 4AF83 – 4AF86); between Garthorpe and Luddington (4AF91 – 4AF95); and any further locations to be confirmed by the ECoW as required during construction and/or through pre-construction surveys. Outside of the Humber Estuary SPA/Ramsar site boundary, the locations listed above are those where baseline surveys identified qualifying species occurring at levels of over one percent of the designated site qualifying

population. Additional locations as required in the final bullet above would be determined by the presence of qualifying species only within 500 m of locations where their numbers reach this population threshold. The fencing will be in use for the duration of the seasonal presence of the affected qualifying species of the Humber Estuary SPA and Ramsar Site. In all cases, the fencing should be used between and including the last two weeks in September and the end of the first week of April.

- ON10: Ground conditions permitting, non-percussive piling techniques (e.g., augered piling) should be used wherever piling operations are required, as these are associated with much lower noise profiles.
- ON11: In all cases where piling or other noisy operations are required, soft startup of plant should be implemented such that noise levels build gently rather than suddenly. This will be particularly important where percussive piling cannot be avoided and would involve progressively building the piling impact force to the level required rather than starting at the maximum impact force required to complete the works. This will make some allowance for birds and other protected species that are present in the vicinity of the works to adjust to the noise generated during construction.
- ON13: Any construction activities occurring at height (e.g., erection of pylons, stringing of conductors and works at the River Ouse crossing) that cannot realistically be mitigated will take place where practicable outside the most sensitive periods for qualifying features. A 12-week window for this activity has been identified between the beginning of August and the end of October, which avoids the breeding period for nesting peregrine on a nearby pylon, the peak numbers of Humber Estuary qualifying species that occur within 500 m of the River Ouse crossing and the onset of inclement winter conditions when any disturbance of foraging birds would have a greater adverse effect on foraging rates and species survival.
- ON14: Alternative foraging habitat within arable farmland has been provided in Route Section B as illustrated on **Application Document 6.4.F1 Environmental Statement Figure 4.1 Proposed Project Design**. This land has been provided for use by pink-footed goose, golden plover, lapwing and curlew and has been secured exclusively for the creation and management of this supporting habitat, covering 46ha of farmland under an adequate, guaranteed inter-annual cropping regime. The habitat has been provided within the geographic range currently utilised by the Humber Estuary SPA/Ramsar site qualifying species to ensure that birds will use this new foraging resource. Since the Project will be constructed in phases (with different areas of potential FLL being subject to disturbance at different points in time), this supporting habitat would be made available over the entire construction phase of the Project. and, as a maximum, for the lifetime of the Project to account for any potential loss of foraging habitat associated with displacement of birds from the immediate surrounds of the proposed overhead line during operation.

AEoI Conclusion

9.2.57 The Conservation Objectives for the Humber Estuary SPA are to 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.

9.2.58 This HRA Report concludes that with the adoption of relevant disturbance mitigation measures and provision of enhanced alternative foraging habitat, the effects associated with noise/vibration and visual disturbance will not adversely affect the integrity of the Humber Estuary SPA Conservation Objectives for the following qualifying features (including considered assemblage component species):

- Non-breeding pink-footed goose;
- Non-breeding greylag goose;
- Non-breeding golden plover;
- Non-breeding lapwing;
- Non-breeding curlew;
- Non-breeding mallard;
- Non-breeding teal;
- Non-breeding wigeon;
- Non-breeding bittern;
- Non-breeding little egret;
- Non-breeding shelduck;
- Non-breeding snipe;
- Non-breeding green sandpiper; and
- Breeding marsh harrier.

9.2.59 This HRA Report also concludes that with the adoption of relevant mitigation, the effects associated with noise/visual disturbance will not adversely affect the Humber Estuary Ramsar site features under Criterion 5 – Bird Assemblages of International Importance: Wintering waterfowl, and Criterion 6 – Bird Species/Populations Occurring at Levels of International Importance.

9.3 Operational Phase

Loss of Functionally Linked Land

Humber Estuary SPA/Ramsar site

9.3.1 Permanent operational-phase habitat losses within arable farmland used regularly by Humber Estuary SPA/Ramsar qualifying features outside of the designated site boundary could occur as a result of:

- Losses of arable farmland beneath the permanent footprint of each pylon; and
- Arable farmland that is not removed but is 'islanded' between the existing and proposed overhead lines, which could effectively become less suitable to those qualifying features of the Humber Estuary SPA/Ramsar that forage in such habitats and that are characterised by large body size, poor wing loading and low manoeuvrability (almost exclusively pink-footed goose and greylag goose). This makes it difficult for them to alight to or take flight from islanded habitat safely, potentially rendering it unavailable to them as a foraging resource.

9.3.2 There will be a small amount of permanent habitat loss under the footprint of each pylon. Cumulative habitat loss beneath pylons is unlikely to be significant because the proposed pylons are mostly spaced at intervals of between 300 and 400 m from each other, with each pylon occupying a small proportion of an individual field, as opposed to the cumulative habitat losses that would occur if multiple pylons were placed in a single field. The remainder of any impacted fields would continue to be available for foraging/roosting, ensuring that the functionality of the field unit is not impacted. The qualifying features occurring in the landscape either side of the Rivers Humber and Ouse forage in open spaces away from field boundaries and other physical features that reduce the open-ness of the environment (such as woodlands, hedgerows and dense scrub), therefore pylons constructed in close proximity to field edges would typically be within habitat that is suboptimal for these qualifying features of the Humber Estuary SPA/Ramsar site.

9.3.3 Habitat islanded between the existing and proposed overhead lines between Ellerker and Luddington is a part of the wider arable farmland resource across which Humber Estuary SPA/Ramsar site qualifying features forage. The baseline data demonstrate that the species potentially affected would primarily be pink-footed goose, greylag goose, lapwing and golden plover, although the latter two species are more likely to be capable of accessing islanded habitat because of their smaller size and greater manoeuvrability in flight. The baseline data include numerous records of lapwing and golden plover foraging alongside the existing overhead line and pylons, indicating that they are likely to be less affected by the presence of overhead lines.

Mitigation

9.3.4 Environmental appraisal has been an integral part of the Project design from the outset, which has meant that the Project has been able to avoid environmentally sensitive features as far as reasonably practicable. National Grid has also embedded measures into the design of the Project to avoid or reduce significant effects that may otherwise be experienced during construction and operation/maintenance of the Project.

9.3.5 Embedded measures are those that are intrinsic to and built into the design of the Project; these are presented in **Application Document 7.3 Register of Environmental Actions and Commitments**. Embedded measures of relevance to the assessment of loss of FLL are:

- EDM01: Sensitive routeing and siting was undertaken to develop the proposed overhead line alignment and draft Order Limits. The routeing and siting avoids and reduces, as far as practicable, impacts on identified receptors, in line with the Overarching National Policy Statement for Energy (EN-1) (Department for Energy Security and Net Zero, 2025) and National Policy Statement for Electricity Networks Infrastructure (EN-5) (Department for Energy Security and Net Zero, 2025) as well as the Holford Rules (National Grid, 1959).
- EDM03: Where possible, the proposed overhead line has been designed to be parallel to or close parallel with the existing overhead lines. Route Sections where close parallel and pylon synchronicity has been achieved, considering constraints present along the existing overhead lines as well as technical complexity, include:
  - Sections within Route Sections A and B to reduce effects on the Yorkshire Wolds Important Landscape Area and potential effects of collision risk, habitat loss and disturbance of interest features of the Humber Estuary Special Protection Area (SPA) and Ramsar site; and
  - Route Section D to reduce effects on the Isle of Axholme Area of Special Historic Landscape Interest.
- EDM05: The design includes strategically located and optimised construction access tracks along the Project alignment to reduce the impact on the local highway network. This includes the inclusion of largely continuous construction access tracks, breaking only as a result of major roads, railways, areas of environmental constraints and/or major watercourses.
- EDM06: Construction effects have been designed out/ minimised as far as practicable through, for example, minimising land-take/habitat loss and locating construction access tracks and temporary construction compounds/ material storage areas outside of ecologically sensitive sites/ habitats (such as statutory and non-statutory designated sites, priority habitats and wetlands).

9.3.6 To mitigate for any potential loss of FLL between the two (proposed and existing) overhead lines, alternative foraging habitat within arable farmland has been provided in Route Section B as illustrated on **Application Document 6.4.F1 Environmental Statement Figure 4.1 Proposed Project Design**. This is detailed in **Application Document 7.3 Register of Environmental Actions and Commitments** commitment reference ON14:

- This land has been provided for use by pink-footed goose, golden plover, lapwing and curlew and has been secured exclusively for the creation and management of this supporting habitat, covering 46 ha of farmland under an adequate, guaranteed inter-annual cropping regime. The habitat has been provided within the geographic range currently utilised by the Humber Estuary SPA/Ramsar site qualifying species to ensure that birds will use this new foraging resource. Since the Project will be constructed in phases (with different areas of potential FLL being subject to disturbance at different points in time), this supporting habitat would be made available over the entire construction phase of the Project. and, as a maximum, for the lifetime of the Project to account for any potential loss of foraging habitat associated with displacement of birds from the immediate surrounds of the proposed overhead line during operation.

AEoI Conclusion

9.3.7 The Conservation Objectives for the Humber Estuary SPA are to 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.

9.3.8 This HRA Report concludes that with the adoption of relevant mitigation and provision of enhanced alternative foraging habitat, the effects associated with loss of FLL will not adversely affect the integrity of the Humber Estuary SPA Conservation Objectives for the following qualifying features (including considered assemblage component species):

- Non-breeding pink-footed goose;
- Non-breeding greylag goose;
- Non-breeding golden plover;
- Non-breeding lapwing;
- Non-breeding curlew;
- Non-breeding mallard;
- Non-breeding teal;
- Non-breeding wigeon;
- Non-breeding bittern;
- Non-breeding little egret;
- Non-breeding shelduck;
- Non-breeding snipe; and
- Breeding marsh harrier.

9.3.9 This HRA Report also concludes that with the adoption of relevant mitigation, the effects associated with this loss of FLL will not adversely affect the Humber Estuary Ramsar site features under Criterion 5 – Bird Assemblages of International Importance: Wintering waterfowl, and Criterion 6 – Bird Species/Populations Occurring at Levels of International Importance.

Barriers to Movement

Humber Estuary SPA/Ramsar site

9.3.10 As discussed in section 7.8, overhead power lines can present a barrier to bird movement, but the effect is species-specific and landscape-dependent. In ecological terms, they are not usually a complete barrier, but they can function as partial or behavioural barriers in certain situations, particularly for larger or more sensitive species.

9.3.11 A barrier effect does not require birds to be physically unable to cross a feature. Instead, it occurs when birds exhibit behavioural changes that result in them:

- Avoiding crossing or passing through an area; and
- Altering their flight paths as they approach a barrier.

9.3.12 Power lines therefore act primarily as a behavioural or risk-based barrier, rather than a hard physical one (potential collision is addressed separately in next section and in **Application Document 6.9.A3 Appendix 9.3 Flight Activity Assessment**). However, the barrier effects described above are unlikely to be significant for the proposed overhead line for the following reasons:

- Baseline conditions include an existing overhead line, which has been in place since the 1960s. The dimensions of the proposed overhead line are very similar to the existing one and it would be arranged in a close parallel design with the lines typically within 100–120 m of each other. For overflying birds this would not present a scenario that is significantly different from baseline conditions.
- The distribution of all Humber Estuary SPA qualifying features across the survey area did not show any bias for one side of the existing overhead line; rather the distribution of birds was even across the areas surveyed and in line with the general availability of habitats. This suggests that the existing overhead line is not a limiting factor to the dispersal of birds across the landscape either side of the Rivers Ouse and Humber. Since survey effort was focused evenly and intensively across the Project where it crosses the Humberhead Levels between Brantingham and Keadby, this observation cannot be attributed to differences in survey effort.

9.3.13 The conclusion above is corroborated by the high proportions of birds recorded in flight crossing the existing overhead line as taken from the data presented for all species in Table 6.1 of **Application Document 6.9.A3 Appendix 6.3 Flight Activity Assessment**. The surveys carried out at (in geographical order from north to south) VPs 1, 19, 20, 2-8, 10, 12 and 17 included observations of bird interactions with existing overhead lines of similar proportions to the proposed overhead line, which at these locations would be in close parallel with the existing overhead line. There were 89,410 bird passes recorded at these VPs, of which 27,661 (30.1%) crossed the Order Limits at a height that would put them at risk of collision with a proposed (and existing) overhead line and a larger proportion still crossed the Order Limits at any height.

9.3.14 For the reasons stated above, the potential effects of a barrier to the movement/ dispersal of birds are not considered to result in an adverse effect on site integrity and achievement of the conservation objectives.

AEoI Conclusion

9.3.15 The Conservation Objectives for the Humber Estuary SPA are to 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.

9.3.16 This HRA Report concludes that the effects associated with Barriers to Movement will not adversely affect the integrity of the Humber Estuary SPA Conservation Objectives for any of the qualifying features:

9.3.17 This HRA Report also concludes that the effects associated with Barriers to Movement will not adversely affect the Humber Estuary Ramsar site features under Criterion 5 – Bird Assemblages of International Importance: Wintering waterfowl, and Criterion 6 – Bird Species/Populations Occurring at Levels of International Importance.

Injury or Mortality

Humber Estuary SPA/Ramsar site

9.3.18 It is widely accepted that overhead lines can create a risk of avian collision mortality. There are several factors that contribute to this risk:

- Species-specific morphology and biology – species with larger body sizes and high wing loadings, displaying flocking behaviour and being active at night are all associated with increased collision risk. For example, swans, geese and other large waterfowl species are of particular concern due to their large body size, high wing loading and limited manoeuvrability.
- Landscape-scale habitat use – overhead lines near protected areas, FLL, important flyways or other focal areas of significant bird activity are likely to result in increased collision rates.
- Weather – strong winds, fog and heavy rain may reduce the flight altitude, affect flight control and reduce visibility of structures and landscape features to qualifying birds.
- Technical specification of the overhead line – spacing of conductors and presence of earth wires can increase or mitigate collision risk. For example, earth wires (the thinner wires located at the top of pylons) are less visible to birds and are likely to pose a greater collision risk for individuals avoiding the thicker conductors (Avian Power Line Interaction Committee (APLIC)., 2012), (Jenkins, 2010), (Bernardino, et al., 2018). Furthermore, conductor wires are often arranged into closely-spaced bundles making them easier to detect by an approaching bird. With the exception of a short section of overhead line east of Crowle and over the Ouse crossing point, the proposed overhead line features conductors in bundles of 3. This is termed a ‘Triple Araucaria’ design.

9.3.19 **Application Document 6.9.A3 Appendix 9.3 Flight Activity Assessment** provides a detailed breakdown of flight activity for the species at risk of collision across the whole Project and explains the method used for estimating collision mortality associated with the proposed overhead line. Collision estimates and supporting narrative are provided for several qualifying features and winter assemblage features of the Humber Estuary SPA/Ramsar site, including:

- Non-breeding pink-footed goose;
- Non-breeding golden plover;
- Non-breeding lapwing;
- Non-breeding curlew;
- Non-breeding greylag goose;
- Non-breeding mallard;
- Non-breeding shelduck; and
- Breeding marsh harrier.

9.3.20 The following qualifying features and winter assemblage features were recorded within the survey area but are not considered further because they contributed negligible or zero flight activity to the baseline:

- Non-breeding pochard;
- Non-breeding shoveler;
- Non-breeding teal;
- Non-breeding wigeon;
- Non-breeding goldeneye;
- Breeding and non-breeding bittern;
- Non-breeding snipe; and
- Non-breeding little egret.

9.3.21 A key consideration for the collision risk estimates is that there is no recognised, standardised methodology or guidance for undertaking bird flight collision risk analysis for overhead lines, although extensive documentation is available for wind farms and this is often used as a proxy on overhead lines. A generally agreed quantitative starting point is estimating the number of flights through the proposed overhead line and the collision risk area, extrapolating records to represent seasonal and annual traffic rates and looking at a range of avoidance rates in the first instance. However, there is no accepted or robust proven model to account for these various quantitative approaches. Avoidance rates are theoretical and untested, mainly they exist for wind turbines and do not have any direct evidence to being relevant for overhead lines.

9.3.22 Consequently, the assessment of flight activity and risk presented in **Application Document 6.9.A3 Appendix 9.3 Flight Activity Assessment** does not provide a modelled prediction of the number of bird collisions with the proposed overhead line. Instead, the data derived from surveys are used to determine a predicted annual number of bird passes through the airspace occupied by the conductor and earth wires and within the airspace viewed from each VP to provide a comparative level of collision risk across the proposed overhead line route without bird diverters installed.

9.3.23 **Application Document 6.9.A3 Appendix 9.3 Flight Activity Assessment** summarises the collision risk estimated for each species, attributable to the whole Project. Further summary information is provided that identifies where the key focal areas of bird activity, and therefore greatest collision risk, lie within the foraging range of qualifying features of the Humber Estuary SPA.

9.3.24 To date, no published studies have been carried out to determine widely applicable collision avoidance for overhead lines as they have for onshore wind farms (NatureScot, 2025). Nevertheless, it stands to reason that avoidance of collisions must occur either through evasive action, gradual alterations to flight paths or behavioural changes (such as alteration of commuting and migratory routes).

9.3.25 Vantage Point surveys across the whole Project amounted to 2,380.25 hours of survey effort, during which 103,910 bird passes were recorded through the VP viewsheds. The surveys carried out at (in geographical order from north to south) VPs 1, 19, 20, 2–8, 10, 12 and 17 included observations of bird interactions with existing overhead lines of similar proportions to the proposed overhead line. There were 89,410 bird passes recorded at these VPs, of which 27,661 (30.1 percent) were at a height that corresponded with the overhead line conductor bundles and earth wire; a height band where there is a potential risk of collision.

9.3.26 No collisions were recorded from the recorded 89,410 bird passes, with only a single interaction between a flying bird and an earth wire. A single Bewick's swan (*Cygnus bewickii*) was recorded as a near miss, "grazing" the earth wire as it gained height to cross the existing overhead line adjacent to Broomfleet Tileworks in Route Section A. As the only occurrence of a collision event, this represents a Project specific collision rate of 0.004 percent and subsequent avoidance rate of 99.996 percent.

9.3.27 While this does not account for species-specific differences in collision avoidance rates, given the large number of flights by large birds with high wing loading (geese, swans)[14] that contribute to the overall dataset, it does indicate that avoidance of the proposed overhead line is likely to be very high by most species. This is especially likely to be true where the proposed overhead line is anticipated to be in close parallel with the existing one, as it is across most of the Yorkshire Wolds (Section A) and the Humberhead Levels as far south as Luddington (Section A and part of Section B).

9.3.28 Taking a conservative avoidance rate of 99.99 percent, the collision estimates are low to very low for all species (**see Application Document 6.9.A3 Appendix 9.3 Flight Activity Assessment**).

9.3.29 The contribution of marsh harrier flights recorded at VPs 18a and 18b to the already very low mortality estimate for this species can be disregarded because these VPs were established to monitor a focal point for this species away from the Humber Estuary and at least 900 m north of the proposed overhead line.

9.3.30 Other than pink-footed goose, only the collision estimate for lapwing shows the potential for any higher level of mortality. However, a significant proportion of the estimated risk for this species occurs at a location beyond the likely foraging range of this species from the Humber Estuary. Furthermore, lapwings are relatively small, highly manoeuvrable and therefore the avoidance of collisions with overhead lines by

[14] Large wildfowl are typically less able to avoid obstacles in flight than are smaller more manoeuvrable birds such as small waders, due to their large size and high wing loading.

this species is likely to be greater than the assumed avoidance rate presented in the collision estimates.

9.3.31 Estimated collision rates for pink-footed goose were higher than for any other species, which is a reflection of the abundance and frequency of occurrence of this species in flight across a broad area between the Market Weighton Canal and Luddington. Relative levels of collision risk for pink-footed goose were a good proxy for those observed for greylag goose, although the estimated collision rates were much lower for this species.

9.3.32 Taking the above observations into account, requirements for mitigation of potential collision mortality are driven by the collision risk for pink-footed goose, and location-specific mitigation is recommended on this basis.

9.3.33 A key point to note is that collision events are very infrequent, of a random nature and difficult to model. The assessment presented within **Application Document 6.9.A3 Appendix 9.3 Flight Activity Assessment** highlights areas of relatively high levels of flight activity that present the greatest risk of collision events should conditions occur that increase the risk of this happening (such as inclement weather at a time when mass movements of birds are likely). Location-specific mitigation, guided by this risk assessment, is presented as a precautionary provision to minimise risk during such events, to levels that are below any significance threshold in HRA terms.

9.3.34 To summarise, as bird collision is a key potential risk of the proposed overhead lines, representative surveys were undertaken to quantify flight activity in key sensitive locations. Surveys focussed on representative areas along the route of the proposed overhead line where there may be 'hotspots' of activity, e.g. potential flyways (along main river crossings as an example), areas of expected activity (wetlands for example) and where the proposed overhead line is in proximity to designated sites that support qualifying features of ornithological importance.

9.3.35 Bird Diverters are recommended as a precautionary mitigation measure to offset the rare but potentially significant implications of collision events and the resultant adverse effects on the integrity of European Sites (SPAs and Ramsar sites). As it is not possible to predict accurately when, and the magnitude of, collision events may occur, bird flight activity assessment and assessment of collision risk is used to determine the most likely spans where risk is highest. It is only these high-risk areas where bird diverters are recommended for installation. This is detailed in **Application Document 7.3 Register of Environmental Actions and Commitments** commitment reference ON08:

- Bird diverters will be installed on the following sections of the proposed overhead line to minimise the potential risk of collision mortality for qualifying species of the Humber Estuary SSSI/Ramsar/SPA and the River Idle Washlands SSSI:
  - Between pylons 4AF62 and 4AF70 adjacent to Broomfleet Tileworks;
  - Between pylons 4AF77 and 4AF96 that cross the River Ouse; and
  - Between pylons 4AF171 and 4AF180 between the River Idle and the Chesterfield Canal.

AEoI Conclusion

9.3.36 The Conservation Objectives for the Humber Estuary SPA are to 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.

9.3.37 This HRA Report concludes that with the implementation of bird diverters any effects associated with injury or mortality will not adversely affect the integrity of the Humber Estuary SPA Conservation Objectives for any of the following qualifying features (including considered assemblage component species):

- Non-breeding pink-footed goose;
- Non-breeding golden plover;
- Non-breeding lapwing;
- Non-breeding curlew;
- Non-breeding greylag goose;
- Non-breeding mallard;
- Non-breeding shelduck; and
- Breeding marsh harrier.

9.3.38 This HRA Report also concludes that the effects associated with injury or mortality will not adversely affect the Humber Estuary Ramsar site features under Criterion 5 – Bird Assemblages of International Importance: Wintering waterfowl, and Criterion 6 – Bird Species/Populations Occurring at Levels of International Importance.

9.4 Stage 2: Appropriate Assessment Outcome

9.4.1 The Stage 2 assessment considered the worst-case construction and operational scenarios, alongside embedded design measures and additional mitigation secured through the DCO. Key mitigation included sensitive route alignment, close paralleling with existing overhead lines, provision of approximately 46 hectares of replacement and enhanced foraging habitat for SPA/Ramsar qualifying features, controls on construction disturbance, and the installation of bird diverters on identified higher-risk spans of the proposed overhead line. The assessment also considered extensive ornithological survey data collected between 2022 and 2026, flight activity analysis, noise and air quality assessments and consultation with Natural England and various non-statutory conservation organisations.

9.4.2 Taking account of these measures, this HRA report concludes that the Project, alone, would not result in an adverse effect on the integrity of the Humber Estuary SAC, Humber Estuary SPA, Humber Estuary Ramsar site, Thorne and Hatfield Moors SPA, Thorne Moor SAC or Hatfield Moor SAC. The conservation objectives of all relevant European and Ramsar sites would be maintained, and the Project would therefore be compliant with the requirements of the Habitats Regulations

10. In-Combination Assessment

10.1 Introduction

10.1.1 Whilst there is no statutory definition of what constitutes a 'plan' or 'project' for the purposes of the Habitats Regulations (HM Government, 2017), Planning Inspectorate Advice on Habitats Regulations Assessment (Planning Inspectorate, 2024, updated 2026) states that the following (but not limited to) should be considered for the HRA in-combination assessment:

- Projects that are under construction;
- Permitted application or applications not yet developed;
- Submitted application or applications not yet decided;
- Refused plans or projects subject to an appeal but not yet decided;
- Projects on the Planning Inspectorate's national infrastructure programme of projects; and
- Projects identified in the relevant development plan (and emerging development plans – with appropriate weight being given as they move closer to adoption).

10.1.2 A 'short list' of developments with the potential for in-combination effects has been compiled within **Document Number 6.21 Chapter 21 Inter-project Cumulative effects.** This short list then underwent the Stage 4 assessment on a topic-by-topic basis including ecology and ornithology receptors.

10.1.3 Table 10.1 summarises the Stage 4 assessment in relation to European sites and their qualifying features

10.1.4 The in-combination assessment concludes that the Project in-combination with other relevant plans and projects, would not result in an adverse effect on the integrity of the Humber Estuary SAC, Humber Estuary SPA, Humber Estuary Ramsar site, Thorne and Hatfield Moors SPA, Thorne Moor SAC or Hatfield Moor SAC. The conservation objectives of all relevant European and Ramsar sites would be maintained.

10.2 In-combination Assessment Table

Table 10.1 – HRA In-combination summary table

Tier	Application Reference	Other development	Effect on shared receptors from the Project	Effect on shared receptors from the 'other development'	In-combination effects with the Project?	Additional mitigation needed	Residual in-combination effect
2	EN010143	**East Yorkshire Solar Farm**	The construction phases do not overlap therefore only operational-phase effects are considered. Residual effects on relevant shared receptors during the operational phase: Humber Estuary SPA and Ramsar site qualifying features (lapwing, golden plover and pink-footed goose) – **Minor adverse (not significant)** – collision only;	No residual effects are reported for the proposed development in East Yorkshire Solar farm Volume 1, Chapter 8: Ecology (Document Reference EN010143/APP/6.1) during the operational phase.	Since no residual effects are reported for the other development, there can be no in-combination effects from both developments.	None	No residual significant in-combination effects
1	EN010114	**Keadby 3 Carbon Capture Power Station**	Residual effects during construction of the Project on shared receptors include:	All effects on shared receptors during construction are **negligible (not significant)**.	The ES for the other development identifies all effects on ornithology	None	No residual significant in-combination effects

Tier	Application Reference	Other development	Effect on shared receptors from the Project	Effect on shared receptors from the 'other development'	In-combination effects with the Project?	Additional mitigation needed	Residual in-combination effect
			disturbance of qualifying features of the Humber Estuary SPA/Ramsar site, which are **negligible (not significant)**. Since the other project will have no effects on birds during the operational phase, there are no shared receptors to consider during operation of the Project.		receptors as negligible. Furthermore, where potential effects on the qualifying features of the Humber Estuary SPA/SAC/Ramsar site are identified, these would affect only very small numbers of qualifying features at a significant distance from the core habitats that support qualifying features identified for the Project, and therefore no overlap of effects would occur. Therefore, no significant in-combination effects are identified.		
1	EN010159	**One Earth Solar Farm**	Shared receptors and impact pathways resulting	The ES for the other development identifies **no significant effects**	With the application of mitigation for the other	None	No residual significant in-

Tier	Application Reference	Other development	Effect on shared receptors from the Project	Effect on shared receptors from the 'other development'	In-combination effects with the Project?	Additional mitigation needed	Residual in-combination effect
			in adverse effects include: Noise and vibration effects on Humber Estuary SAC/SPA/Ramsar Site, for which the residual effects of the project will be **negligible (not significant)** during construction only; Habitat loss and disturbance effects on wintering birds (waders and geese), for which the residual effects of the Project will be **negligible (not significant)** during construction and operation.	on the shared receptors provided the mitigation identified in the chapter and set out in the Outline LEMP, Outline Construction Environmental Management Plan (CEMP) and the Outline Decommissioning Environmental Management Plan (DEMP) for that development are delivered: The "nature of effect" is described for the other Project as "Negligible" for the Humber Estuary SPA/Ramsar Site.	development none of the residual effects arising from the Project or the other development will result in significant in-combination effects.		combination effects
1	EN010157	**Peartree Solar**	Shared receptors during the construction phase include qualifying features of the Humber Estuary SPA and Ramsar site. The residual	The ES for the other development identifies that, with the provision of embedded mitigation identified and secured through an outline	The limited temporal and spatial overlap between construction phases of the Project and the other	None	No residual significant in-combination effects

Tier	Application Reference	Other development	Effect on shared receptors from the Project	Effect on shared receptors from the 'other development'	In-combination effects with the Project?	Additional mitigation needed	Residual in-combination effect
			effects on these are **negligible (not significant)**. There will be no operational effects of the Project on shared receptors at this location.	LEMP and an outline CEMP and additional mitigation (including habitat creation for wetland and breeding birds) there will be **no significant effects** on the shared receptors. Furthermore, spatial overlap between the Project and the other development occurs only along an access track between Park Lane and Wanlass substation. Temporal overlap of the construction phases will occur only for c. 6 months in 2028, which is predicted to overlap one breeding bird season only.	development and the provision of the specified mitigation will ensure that there are no significant in-combination effects.		

Tier	Application Reference	Other development	Effect on shared receptors from the Project	Effect on shared receptors from the 'other development'	In-combination effects with the Project?	Additional mitigation needed	Residual in-combination effect
2	EN010144	**Dogger Bank D Wind Farm**	Not applicable as the other development is at pre-application stage, therefore no assessment is available at this stage to determine shared receptors.	This development is at pre-application stage, therefore no assessment is available for this development.	Cannot be determined	Cannot be determined	Cannot be determined
2	EN0710003	**Humber Carbon Capture Pipeline**	Not applicable as the other development is at pre-application stage and only the potential ornithology receptors and impact pathways have been identified in the PEIR for the other development. Potential shared receptors and impact pathways are: Humber Estuary SAC, SPA, Ramsar and SSSI (described in the other development's	While potential ornithology receptors have been identified in the other development's PEIR as stated, there are no assessments of potential effects available, nor are the receptors confirmed by baseline studies. at this stage.	The other development is in pre-application and is expected to be submitted February 2027. Further construction information is not available. Therefore, due to timescales, this development would likely need to take the Project into consideration when they complete their in-combination assessment.	Cannot be determined	Cannot be determined

Tier	Application Reference	Other development	Effect on shared receptors from the Project	Effect on shared receptors from the 'other development'	In-combination effects with the Project?	Additional mitigation needed	Residual in-combination effect
			PEIR as the "River Humber Corridor and Holderness Coast") – disturbance of qualifying features during construction; potential habitat loss during construction. Birds (assumed to be breeding and non-breeding birds) – disturbance and habitat loss during construction				
2	EN0110018	**Clean Air Solar Farm**	Not applicable as the other development is at pre-application stage, therefore no assessment is available at this stage to determine shared receptors.	This development is at pre-application stage, therefore no assessment is available at this stage.	The other development is in pre-application and is expected to be submitted June 2027. Further construction information is not available. Therefore, due to timescales, this development would likely need	Cannot be determined	Cannot be determined

Tier	Application Reference	Other development	Effect on shared receptors from the Project	Effect on shared receptors from the 'other development'	In-combination effects with the Project?	Additional mitigation needed	Residual in-combination effect
					to take the Project into consideration when they complete their in-combination assessment.		
2	EN0110001	**The Keadby Next Generation Power Station Project**	Residual effects during construction of the Project on shared receptors include: disturbance of qualifying features of the Humber Estuary SPA/Ramsar sites, which are **negligible (not significant)**; and disturbance and habitat losses for breeding (farmland) birds, which are **minor adverse (not significant)**. There are no shared impact pathways on any ornithology	All effects on shared ornithology receptors are **negligible (not significant)**.	The ES for the other development identifies all effects on ornithology receptors as negligible. Furthermore, where potential effects on the qualifying features of the Humber Estuary SPA/Ramsar site are identified, these would affect only very small numbers of qualifying features at a significant distance from the core habitats that support qualifying features identified for the Project,	None	No residual significant in-combination effects

Tier	Application Reference	Other development	Effect on shared receptors from the Project	Effect on shared receptors from the 'other development'	In-combination effects with the Project?	Additional mitigation needed	Residual in-combination effect
			receptors during the operational phase of the Project.		and therefore no overlap of effects would occur. Therefore, no significant in-combination effects are identified.		
3	EN0710006	**Humber Hydrogen Pipeline**	Not applicable as the other development is at pre-application stage, therefore no assessment is available at this stage to determine shared receptors.	This development is at pre-application stage, therefore no assessment is available at this stage.	The other development is in pre-application and is expected to be submitted between October and December 2027. No further construction information is available, however it is likely that, if approved, the construction period will partially overlap that of the Project. Therefore, this development would likely need to take the Project into consideration when they	Cannot be determined	Cannot be determined

Tier	Application Reference	Other development	Effect on shared receptors from the Project	Effect on shared receptors from the 'other development'	In-combination effects with the Project?	Additional mitigation needed	Residual in-combination effect
					complete their in-combination assessment.		
3	EN0110029	**Prototype fusion energy plant, STEP Fusion, West Burton**	Not applicable as the other development is at pre-application stage, therefore no assessment is available at this stage to determine shared receptors.	This development is at pre-application stage; therefore no assessment is available at this stage.	The other development is in pre-application, and no construction information is available. Construction is anticipated to occur from 2030 onwards, which would partially overlap that of the Project. Therefore, this development would likely need to take the Project into consideration when they complete their in-combination assessment.	Cannot be determined	Cannot be determined
3	EN0610001	**H2East Pipeline: Humber to Nottinghamshire**	Not applicable as the other development is at pre-application	This development is at pre-application stage; therefore no assessment is	The other development is in pre-application and is expected	Cannot be determined	Cannot be determined

Tier	Application Reference	Other development	Effect on shared receptors from the Project	Effect on shared receptors from the 'other development'	In-combination effects with the Project?	Additional mitigation needed	Residual in-combination effect
			stage, therefore no assessment is available at this stage to determine shared receptors.	available at this stage.	to be submitted in December 2028. Construction is anticipated to commence in 2030/2031 and will last approximately three to six months. Therefore, due to timescales, this development would likely need to take the Project into consideration when they complete their in-combination assessment.		
1	EN0110032	**Humberhead Solar**	Not applicable as the other development is at pre-application stage, therefore no assessment is available at this stage to determine shared receptors.	The other development is in pre-application and is expected to be submitted in August 2027. No further construction information is available.	The other development is in pre-application and is expected to be submitted in August 2027. No further construction information is available, however it is likely that, if approved,	Cannot be determined	Cannot be determined

Tier	Application Reference	Other development	Effect on shared receptors from the Project	Effect on shared receptors from the 'other development'	In-combination effects with the Project?	Additional mitigation needed	Residual in-combination effect
					the construction period will partially overlap that of the Project. Therefore, this development would likely need to take the Project into consideration when they complete their in-combination assessment.		
3	EN0710007	**Project Union East Coast**	Not applicable as the other development is at pre-application stage, therefore no assessment is available at this stage to determine shared receptors.	This development is at pre-application stage, therefore no assessment is available at this stage.	The other development is in pre-application and is expected to be submitted in December 2028. No further construction information is available, however it is likely that, if approved, the construction period will partially overlap that of the Project. Therefore, this development would likely need	Cannot be determined	Cannot be determined

Tier	Application Reference	Other development	Effect on shared receptors from the Project	Effect on shared receptors from the 'other development'	In-combination effects with the Project?	Additional mitigation needed	Residual in-combination effect
					to take the Project into consideration when they complete their in-combination assessment.		
3	EN0710008	**East Coast Hydrogen Humber Pipeline**	Not applicable as the other development is at pre-application stage, therefore no assessment is available at this stage to determine shared receptors.	This development is at pre-application stage, therefore no assessment is available at this stage.	The other development is in pre-application and is expected to be submitted in November 2028. No further construction information is available, however it is likely that, if approved, the construction period will partially overlap that of the Project. Therefore, this development would likely need to take the Project into consideration when they complete their in-combination assessment.	Cannot be determined	Cannot be determined

Tier	Application Reference	Other development	Effect on shared receptors from the Project	Effect on shared receptors from the 'other development'	In-combination effects with the Project?	Additional mitigation needed	Residual in-combination effect
3	22/03070/EIASCR	**White Hall Solar farm**	Not applicable as the other development is at pre-application stage, therefore no assessment is available at this stage to determine shared receptors.	This development is at pre-application stage, therefore no assessment is available at this stage.	Cannot be determined	Cannot be determined	Cannot be determined
3	21/01875/EIASCR	**Solar Farm, Cottingham Water Pumping Station**	Not applicable as the other development is at pre-application stage, therefore no assessment is available at this stage to determine shared receptors.	This development is at pre-application stage, therefore no assessment is available at this stage.	Cannot be determined	Cannot be determined	Cannot be determined
2	24/02875/STOUTE	**Land South Of Oak Plantation Common Lane Welton East Riding Of Yorkshire HU15 1WX**	Shared ornithology receptors during construction include: The Humber Estuary SPA/Ramsar site qualifying features; Shared ornithology receptors during operation include:	The other development is supported by a range of mitigation measures to limit the potential effects of disturbance and habitat losses that might affect Humber Estuary SPA/Ramsar site qualifying features during construction	No significant in-combination effects	None	No residual significant in-combination effects

Tier	Application Reference	Other development	Effect on shared receptors from the Project	Effect on shared receptors from the 'other development'	In-combination effects with the Project?	Additional mitigation needed	Residual in-combination effect
			The Humber Estuary SPA/Ramsar site qualifying features. The potential residual effects of the Project are **negligible – minor adverse (not significant)** for these receptors at all stages of the Project.	and operation to levels that are **not significant**.			
2	24/02872/STOUTE	**Land North Of Baffin Way Brough East Riding Of Yorkshire HU15 1YU**	Shared ornithology receptors during both construction and operation of the Project include the Humber Estuary SPA/Ramsar site, through effects on their qualifying features via the following shared impact pathways: Habitat loss, which will be **negligible (not significant)** for construction and operation; and	The other development is supported by a range of mitigation measures to limit the potential effects of disturbance and habitat losses that might affect Humber Estuary SPA/Ramsar site qualifying features during construction and operation. With these measures in place, the ES for the other development reports no	No significant in-combination effects	None	No residual significant in-combination effects

Tier	Application Reference	Other development	Effect on shared receptors from the Project	Effect on shared receptors from the 'other development'	In-combination effects with the Project?	Additional mitigation needed	Residual in-combination effect
			Noise and visual disturbance, which will be **negligible (not significant)** for construction and operation.	significant residual effects on any receptors, although the assessment does not provide receptor-specific detail regarding the magnitude of the residual effects on each receptor.			
2	24/02881/STOUTE	**Land At Ings Lane And East Of Skillings Lane Ings Lane Elloughton East Riding Of Yorkshire HU15 1EN**	This proposed development has been assessed as a part of a larger phased development that includes 24/02875/STOUTE and 24/02872/STOUTE The shared receptors are the same as for the above developments.	The assessment narrative for developments 24/02875/STOUTE and 24/02872/STOUTE applies to this development.	No significant in-combination effects	None	No residual significant in-combination effects
1	25/00111/CLE	**Land South Of Creyke Beck Substation 4875 Park Lane Cottingham East Riding Of**	No ornithology assessment is available for the other development to determine shared receptors.	No ornithology assessment is available for the other development to determine shared receptors.	Cannot be determined	Cannot be determined	Cannot be determined

Tier	Application Reference	Other development	Effect on shared receptors from the Project	Effect on shared receptors from the 'other development'	In-combination effects with the Project?	Additional mitigation needed	Residual in-combination effect
		Yorkshire HU16 5SB					
2	25/00392/STPLF	**Hornsea Four** **Land South Of A1079 And North Of NGET Substation Creyke Beck Park Lane Cottingham East Riding Of Yorkshire**	No ornithology assessment is available for the other development to determine any shared receptors, although breeding birds are identified as a potential receptor and it is highly likely that the other development's effects on breeding birds would be through disturbance and habitat losses predominantly to those species that breed in open farmland. The residual adverse effects of the Project on the farmland breeding bird assemblage are:	No ornithology assessment is available for the other development therefore potential in-combination effects cannot be assessed.	Cannot be determined	Cannot be determined	Cannot be determined

Tier	Application Reference	Other development	Effect on shared receptors from the Project	Effect on shared receptors from the 'other development'	In-combination effects with the Project?	Additional mitigation needed	Residual in-combination effect
			Minor adverse (not significant) for disturbance during construction; **Minor adverse (not significant)** for habitat loss during construction; and **Negligible (not significant)** for habitat loss during operation.				
1	08/01805/STPLFE	**Wienerberger**	Not applicable - No ornithology assessment is available for the other development to determine shared receptors.	No ornithology assessment is available for the other development.	No ornithology assessment is available for the other development to carry out an in-combination assessment. There is partial overlap of the boundaries for the Project and the other development, and it appears that works have already	None	No ornithology assessment is available for the other development to carry out an in-combination assessment, however significant residual in-combination effects are unlikely for

Tier	Application Reference	Other development	Effect on shared receptors from the Project	Effect on shared receptors from the 'other development'	In-combination effects with the Project?	Additional mitigation needed	Residual in-combination effect
					commenced inside the boundary of the other development. The site has been operational since 2010 and is consented to continue extraction and restoration activities until 2068. As such, it is considered an active development throughout the assessment period. Protected and notable species in the area are therefore likely to be habituated, at least in part, to the disturbance associated with construction activities in the area. The Project and the other		the reasons stated.

Tier	Application Reference	Other development	Effect on shared receptors from the Project	Effect on shared receptors from the 'other development'	In-combination effects with the Project?	Additional mitigation needed	Residual in-combination effect
					development will each be bound by their own CoCP and/or a CEMP and it is assumed both will apply best practice construction methods to minimise impacts from pollution, dust, noise, vibration, lighting and disturbance. Appropriate mitigation would be required for both the Project and the other development to avoid impacts to protected species that would otherwise be illegal. Furthermore, clay extraction is permitted only during the months April – September, which will avoid any effects on		

Tier	Application Reference	Other development	Effect on shared receptors from the Project	Effect on shared receptors from the 'other development'	In-combination effects with the Project?	Additional mitigation needed	Residual in-combination effect
					wintering qualifying features of the Humber Estuary SPA, Ramsar site. Therefore, no significant in-combination effects are predicted.		
1	PA/2023/1124	**Lincolnshire Lakes, Land east of M181 and north of Burringham Road, Scunthorpe**	No specific ornithology assessment is available for the other development to determine shared receptors, however an HRA carried out by North Lincolnshire Council identified the potential loss of FLL supporting birds associated with the Humber Estuary, and this is the only shared receptor and pathway in common with those predicted for the Project.	No other specific ornithology assessment is available for the other development to determine shared receptors. A shadow HRA screening of Likely Significant Effects report concluded no LSEs of the other development alone or in combination with other projects. However, Natural England concluded there was insufficient information provided with the planning application	There can be no in-combination effects either during the construction or operational phases of the Project and the other development.	None	No residual significant in-combination effects

Tier	Application Reference	Other development	Effect on shared receptors from the Project	Effect on shared receptors from the 'other development'	In-combination effects with the Project?	Additional mitigation needed	Residual in-combination effect
			The residual effects of losses of FLL attributable to the Project were assessed as **Negligible (not significant)** during construction and operation.	for them to endorse this assessment. An HRA by North Lincolnshire Council concluded that (the only shared) potential impact pathway requiring appropriate assessment is loss of FLL supporting birds associated with Humber Estuary.			
2	PA/SCO/2025/6	**Land west of Scotter Road, The Lakes, Scunthorpe**	No ornithology assessment is available for the other development to determine shared receptors.	No ornithology assessment is available for the other development.	The other development is at the scoping opinion stage. No ornithology assessment is available for the Land west of Scotter Road development to carry out an in-combination assessment.	Cannot be determined	Cannot be determined

Tier	Application Reference	Other development	Effect on shared receptors from the Project	Effect on shared receptors from the 'other development'	In-combination effects with the Project?	Additional mitigation needed	Residual in-combination effect
1	PA/2025/444 (following PA/SCR/2025/1297)	**Pilfrey Solar Farm land off Ealand Road, Keadby/Ealand, Scunthorpe, DN17 4DG**	Shared receptors during construction, and the residual effects of the Project on them for all potentially shared pathways (habitat losses, noise and visual disturbance) are: Humber Estuary SPA/Ramsar site - all shared impact pathways result in effects that are **negligible (not significant)**; Shared receptors during operation include; Humber Estuary SPA/Ramsar site qualifying features. The residual effects of the Project arising from all potentially shared impact pathways on these receptors are	The residual effects of the other development are neutral for all shared receptors, except breeding and wintering birds, the effects on which will be **not significant**. This assessment is conditional on the adherence to all measures to minimise construction impacts set out within a CEMP, and the delivery of habitat enhancement and monitoring measures as set out in the Ecological Impact Assessment for the development.	No significant in-combination effects	None	No residual significant in-combination effects

Tier	Application Reference	Other development	Effect on shared receptors from the Project	Effect on shared receptors from the 'other development'	In-combination effects with the Project?	Additional mitigation needed	Residual in-combination effect
			negligible (not significant).				
1	PA/2025/445	**Moors Solar Farm, Farmhouse, North Moor Farm, Keadby, Scunthorpe, DN17 4DA**	No ornithology assessment is available for the other development to determine the in-combination effects on shared receptors. Residual effects of the Project on potential shared receptors are: Losses of FLL and other habitat for wintering birds which are **negligible (not significant)** during construction and operation; and Temporary disturbance of wintering birds during construction, which are **negligible (not significant).**	No ornithology assessment is available for the other development. The wintering bird survey report for the other development identifies the following potential impact pathways that may affect shared receptors: Direct loss/change of wintering habitat; and Disturbance during construction and/or operation.	No ornithology assessment is available for the Moors Solar Farm proposed development.	Cannot be determined	Cannot be determined

Tier	Application Reference	Other development	Effect on shared receptors from the Project	Effect on shared receptors from the 'other development'	In-combination effects with the Project?	Additional mitigation needed	Residual in-combination effect
1	PA/2023/1915	**Keadby Power Station, Trent Side, Keadby, Scunthorpe, DN17 3EF**	Humber Estuary SPA/Ramsar site are shared receptors. The Project's effect on these receptors will be **minor adverse (not significant)** during operation and **Negligible (not significant)** during construction.	Effects on the SPA/Ramsar site were ruled out by North Lincolnshire Council who stated in their HRA '*that the plan or project is not likely to have a significant effect alone or in combination with other plans and projects on the Humber Estuary Special Protection Area (SPA) and Ramsar site.*'	No anticipated significant in-combination effects	None	No residual significant in-combination effects
3	22/01477/SCR	**Oaks Lane Solar Farm, Land At West And South Of Oaks Lane And North Of Gainsborough Road] Beckingham Doncaster South Yorkshire**	No ornithology assessment is available for the other development to determine shared receptors.	No ornithology assessment is available for the other development as it is has not progressed past the screening opinion stage at the time of this assessment.	Cannot be determined	Cannot be determined	Cannot be determined

Tier	Application Reference	Other development	Effect on shared receptors from the Project	Effect on shared receptors from the 'other development'	In-combination effects with the Project?	Additional mitigation needed	Residual in-combination effect
3	21/00737/SCR	**Solar Photovoltaic Farm**	Not applicable as the other development is at the screening stage, therefore no assessment is available at this stage to determine shared receptors.	This development is at the screening stage, therefore no assessment is available at this stage.	Cannot be determined	Cannot be determined	Cannot be determined
1	20/00117/FUL	**Wood lane solar farm**	There are no significant residual effects on any shared receptors, all residual impacts on shared bird receptors were negligible	There are no significant residual effects on any shared receptors, all residual impacts on birds were negligible.	No in-combination effects	None	No residual significant in-combination effects
1	22/01071/FUL	**Former High Marnham Power Station**	The construction phases do not overlap therefore only operational-phase effects are considered. There are no significant residual effects on any shared receptors	The construction phases do not overlap therefore only operational-phase effects are considered. There are no significant residual effects on any shared receptors	No significant in-combination effects	None	No residual in-combination effects

Tier	Application Reference	Other development	Effect on shared receptors from the Project	Effect on shared receptors from the 'other development'	In-combination effects with the Project?	Additional mitigation needed	Residual in-combination effect
			during the operational phase, all residual impacts on shared bird receptors were negligible	during the operational phase, all residual impacts on birds were negligible.			
2	26/00293/FUL	**America Farm Solar Land South Of America Farm East Of Woodcoates Road North And South Of Green Lane Darlton Nottinghamshire NG22 0TN**	Whilst no ornithology assessment currently available for the other development to determine shared receptors, survey data provided to the council indicates potential impacts on farmland birds – principally skylark. Skylark form part of the wider farmland bird assemblage and residual effects from the Project were identified as **minor adverse (not significant)** to this receptor via temporary habitat loss during	The other developer has proposed off site mitigation to remove effects on skylark; no residual impacts of this species are expected if correct mitigation is implemented. Council ecologist has set requirement for effective mitigation to be agreed.	No anticipated significant in-combination effects.	None	No residual significant in-combination effects

Tier	Application Reference	Other development	Effect on shared receptors from the Project	Effect on shared receptors from the 'other development'	In-combination effects with the Project?	Additional mitigation needed	Residual in-combination effect
			construction and **negligible (not significant)** due to permanent habitat loss during operation.				
2	26/00147/FUL	**Land Southwest Of National Grid High Marnham Substation And East Of Fledborough Road Fledborough Road High Marnham Newark NG22 0FX**	No ornithology assessment is available for the other development to determine shared receptors.	No ornithology assessment is available for the other development although the decision notice does detail mitigation to avoid effects on breeding birds and general habitat improvements.	No anticipated significant in-combination effects.	None	No residual significant in-combination effects
2	26/00300/SCR	**Torksey Ferry Road BESS cable Land South Of Torksey Ferry Road Rampton Nottinghamshire**	No ornithology assessment is available for the other development to determine shared receptors.	No ornithology assessment is available for the other development.	No ornithology assessment is available for the other development to carry out an in-combination assessment. However, this is an underground cable, with an expected construction	None	Cannot be determined

Tier	Application Reference	Other development	Effect on shared receptors from the Project	Effect on shared receptors from the 'other development'	In-combination effects with the Project?	Additional mitigation needed	Residual in-combination effect
					period of six months. Therefore, temporary disturbance impacts are likely to be minimal, with habitats likely reinstated post construction. This would reduce the potential for in-combination effects; there is also no overlap between the other development and the Project.		
2	24/01470/FUL	**Trent BESS Tribus Clean Energy Ltd** **South Of Torksey Ferry Road Rampton, Cottam Nottinghamshire**	No ornithology assessment is available for the other development to determine shared receptors.	No ornithology assessment is available for the other development although the decision notice does detail mitigation to avoid effects on breeding birds and general habitat improvements.	No anticipated significant in-combination effects.	None	No residual significant in-combination effects

Tier	Application Reference	Other development	Effect on shared receptors from the Project	Effect on shared receptors from the 'other development'	In-combination effects with the Project?	Additional mitigation needed	Residual in-combination effect
3	26/00756/SCR	**Chesterfield to High Marnham Substation High Marnham Green Energy Business Park Fledborough Road High Marnham Nottinghamshire**	Potential receptor of farmland bird assemblage however this is not detailed in the development documentation. No ornithology assessment is available for the other development to determine shared receptors. The residual effect on the farmland bird assemblage receptor from the Project were identified as **minor adverse (not significant)** via habitat loss during construction and **negligible (not significant)** during operation.	The District Council screening request response stated that "proposals are therefore not EIA development and do not warrant the production of an Environmental Statement" No ornithology assessment is available for the other development. However, within their scoping response Natural England confirmed that the proposal is not located within, and is not likely to significantly affect, any nationally or internationally designated ecological sites. Natural England recommended that sufficient ecological, landscape and agricultural land information be	No anticipated significant in-combination effects.	None	No residual significant in-combination effects

Tier	Application Reference	Other development	Effect on shared receptors from the Project	Effect on shared receptors from the 'other development'	In-combination effects with the Project?	Additional mitigation needed	Residual in-combination effect
				provided to support the assessment of environmental effects.			
3	26/00709/SCR	**RLD047 Retford Land South Of Southern Roundabout Main Street Milton Nottinghamshire**	Potential receptor of farmland bird assemblage however this is not detailed in the development documentation. No ornithology assessment is available for the other development to determine shared receptors. The residual effects on the farmland bird assemblage receptor from the Project were identified as **minor adverse (not significant)** via habitat loss during construction and **negligible (not significant)** during operation.	The District Council screening request response stated that '*proposals are therefore not EIA development and do not warrant the production of an Environmental Statement*.' In the screening request response the council stated that '*In conjunction with additional landscape planting and the delivery of biodiversity net gain on site, the overall net effect on arboriculture and ecology is likely to be positive*'.	No anticipated significant in-combination effects.	None	No residual significant in-combination effects

Tier	Application Reference	Other development	Effect on shared receptors from the Project	Effect on shared receptors from the 'other development'	In-combination effects with the Project?	Additional mitigation needed	Residual in-combination effect
1	21/01577/FULM	**Tuxford Solar - Land Off Hawbush Road Weston** **Tuxford road solar farm**	No shared receptors to consider.	No residual effects are reported for any ornithological receptors in the Tuxford Road Solar Fram and Battery Storage Ecological Impact Assessment report, subject to the implementation of appropriate mitigation. This includes pollution control measures and pre-construction checks for protected species.	No anticipated significant in-combination effects. Additionally, there is very minimal overlap between the two project boundaries. The main solar farm development is approximately 2.6 km from the Project, with only the solar farm cable connection slightly overlapping with the Project, where it would connect to High Marnham.	None	No residual significant in-combination effects
1	19/01511/FULL	**Richmond Way Land West Of Kingston Upon Hull**	This is an urban development within Hull City, as such there are no overlapping receptors	No shared receptors	No anticipated significant in-combination effects.	None	No residual significant in-combination effects

Tier	Application Reference	Other development	Effect on shared receptors from the Project	Effect on shared receptors from the 'other development'	In-combination effects with the Project?	Additional mitigation needed	Residual in-combination effect
3	25/00941/SCOPE	**East Bank urban village development, Tower Street/St Peter Street Kingston Upon Hull**	This is an urban development within Hull City, as such there are no overlapping receptors	No shared receptors	No anticipated significant in-combination effects.	None	No residual significant in-combination effects

11. Conclusion

11.1.1 As the Project is not directly connected with or necessary for the conservation management of a European site, and it is not possible to rule out the risk of it having a significant effect on a European site on its own or in combination with other proposals, the first step of the HRA process was considered; the test of Likely Significant Effects (HRA Stage 1: Screening) which assesses whether the Project, without any detailed appraisal, is likely to result in a significant effect upon the conservation objectives of a European site.

11.1.2 The HRA Screening considered the following European sites:

- Humber Estuary Special Area of Conservation (SAC) (UK0030170);
- Humber Estuary Special Protection Area (SPA) (UK9006111);
- Humber Estuary Ramsar site (UK11031);
- Thorne and Hatfield Moors SPA (UK9005171);
- Thorne Moor SAC (UK0012915); and
- Hatfield Moor SAC (UK0030166).

11.1.3 The assessment considered a range of impact pathways associated with both the construction and operational phases of the Project, including loss of FLL, disturbance, air quality, hydrological changes, barriers to movement, injury and mortality, and the spread of invasive non-native species. The HRA screening assessment adopted a strong precautionary principle; if a potential effect pathway is identified between the Project and a European site, then that site would be taken through to Appropriate Assessment (AA). This ensured all effects are captured, including de minimis effects.

11.1.4 The Stage 1 Screening assessment concluded that no LSEs would arise in relation to water quality, hydrological change, invasive non-native species and operational traffic emissions for any European sites, or any of the qualifying features of Thorne and Hatfield Moors SPA, Thorne Moor SAC and Hatfield Moor SAC.

11.1.5 LSEs could not be ruled out for certain qualifying features of the Humber Estuary SPA and Ramsar site through the loss of FLL, construction disturbance, operational barriers to movement and injury/mortality associated with the proposed overhead lines. Potential effects from construction dust deposition on qualifying habitats and supporting habitats of the Humber Estuary SAC, SPA and Ramsar site were also screened in for further assessment. As a result, these pathways were progressed to Stage 2: Appropriate Assessment.

11.1.6 The Stage 2 assessment considered the worst-case construction and operational scenarios, alongside embedded design measures and additional mitigation secured through the DCO. Key mitigation included sensitive route alignment, close paralleling with existing overhead lines, provision of approximately 46 hectares of replacement and enhanced foraging habitat for SPA/Ramsar qualifying features, controls on construction disturbance, and the installation of bird diverters on identified higher-risk spans of the proposed overhead line. The assessment also considered extensive

ornithological survey data collected between 2022 and 2026, flight activity analysis, noise and air quality assessments and consultation with Natural England and various non-statutory conservation organisations.

11.1.7 Taking account of these measures, this HRA report concluded that the Project, (either alone or in combination with other plans and projects), would not result in an adverse effect on the integrity of the Humber Estuary SAC, Humber Estuary SPA, Humber Estuary Ramsar site, Thorne and Hatfield Moors SPA, Thorne Moor SAC or Hatfield Moor SAC. The conservation objectives of all relevant European and Ramsar sites would be maintained, and the Project would therefore be compliant with the requirements of the Habitats Regulations

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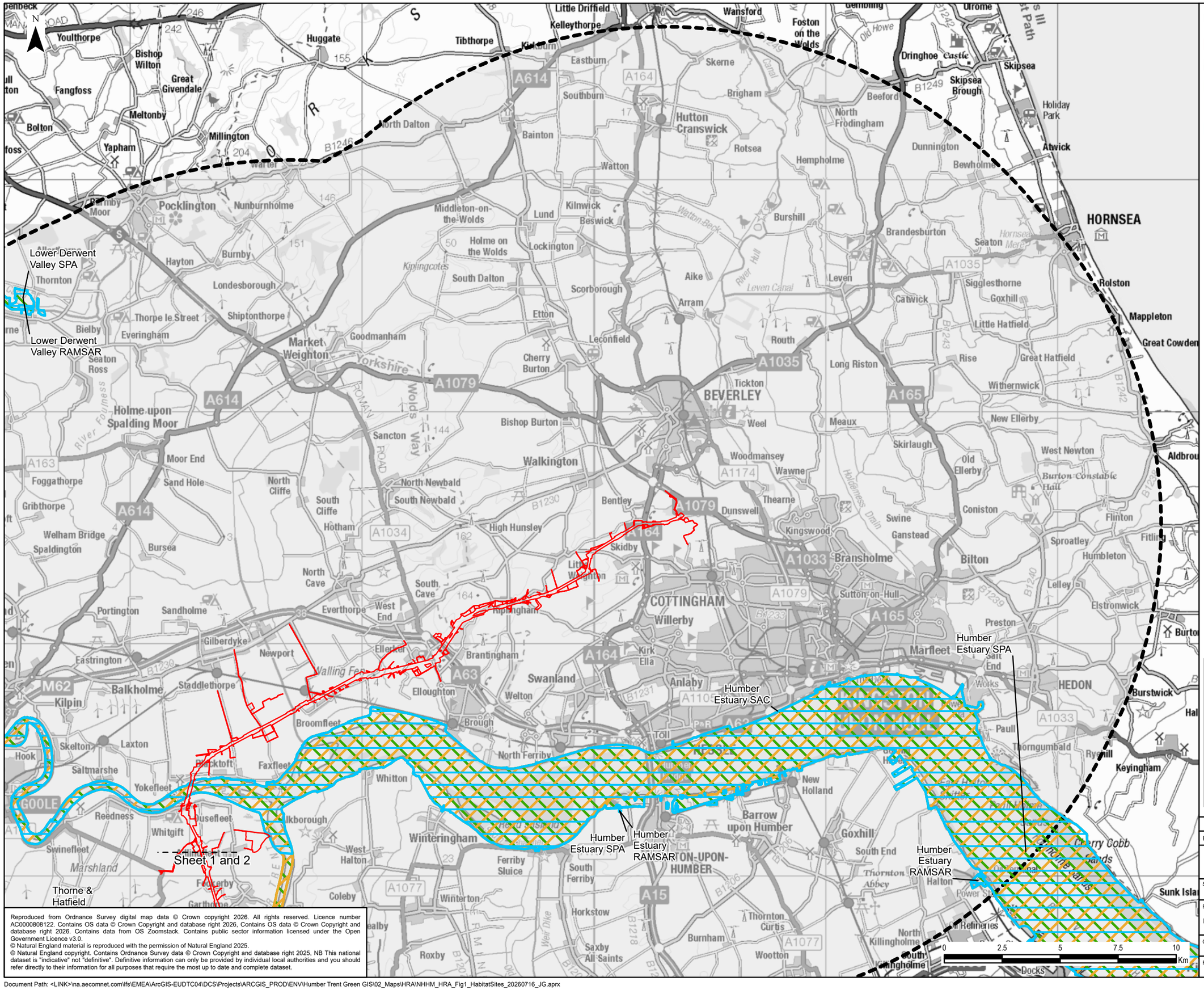
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Appendix A
Location of Relevant European sites in Relation to the Project

nationalgrid

Appendix A
Location of Relevant European sites in Relation to the Project



Legend

- Order Limits
- 20 km Buffer of Order Limits
- Ramsar Site
- Special Area of Conservation (SAC)
- Special Protection Area (SPA)

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Rev	Date	Description	ID	JG	LR
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nationalgrid

Scheme: NORTH HUMBER TO HIGH MARNHAM

Figure Title: FIGURE 1 - 13. APPENDIX A – LOCATION OF RELEVANT HABITATS SITES IN RELATION TO THE PROJECT (SCREENING)

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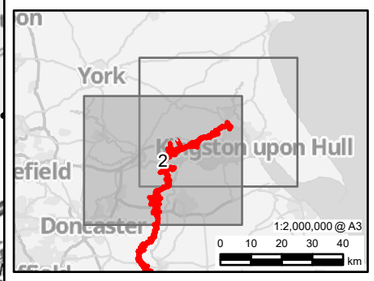
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Lower Derwent Valley SPA
Lower Derwent Valley RAMSAR
Lower Derwent Valley SPA
Lower Derwent Valley RAMSAR
Humber Estuary SPA
Humber Estuary SAC
Humber Estuary RAMSAR
Thorne & Hatfield Moors SPA
Thorne Moor SAC
Sheet 1 and 2

Legend

- Order Limits
- 20 km Buffer of Order Limits
- Ramsar Site
- Special Area of Conservation (SAC)
- Special Protection Area (SPA)



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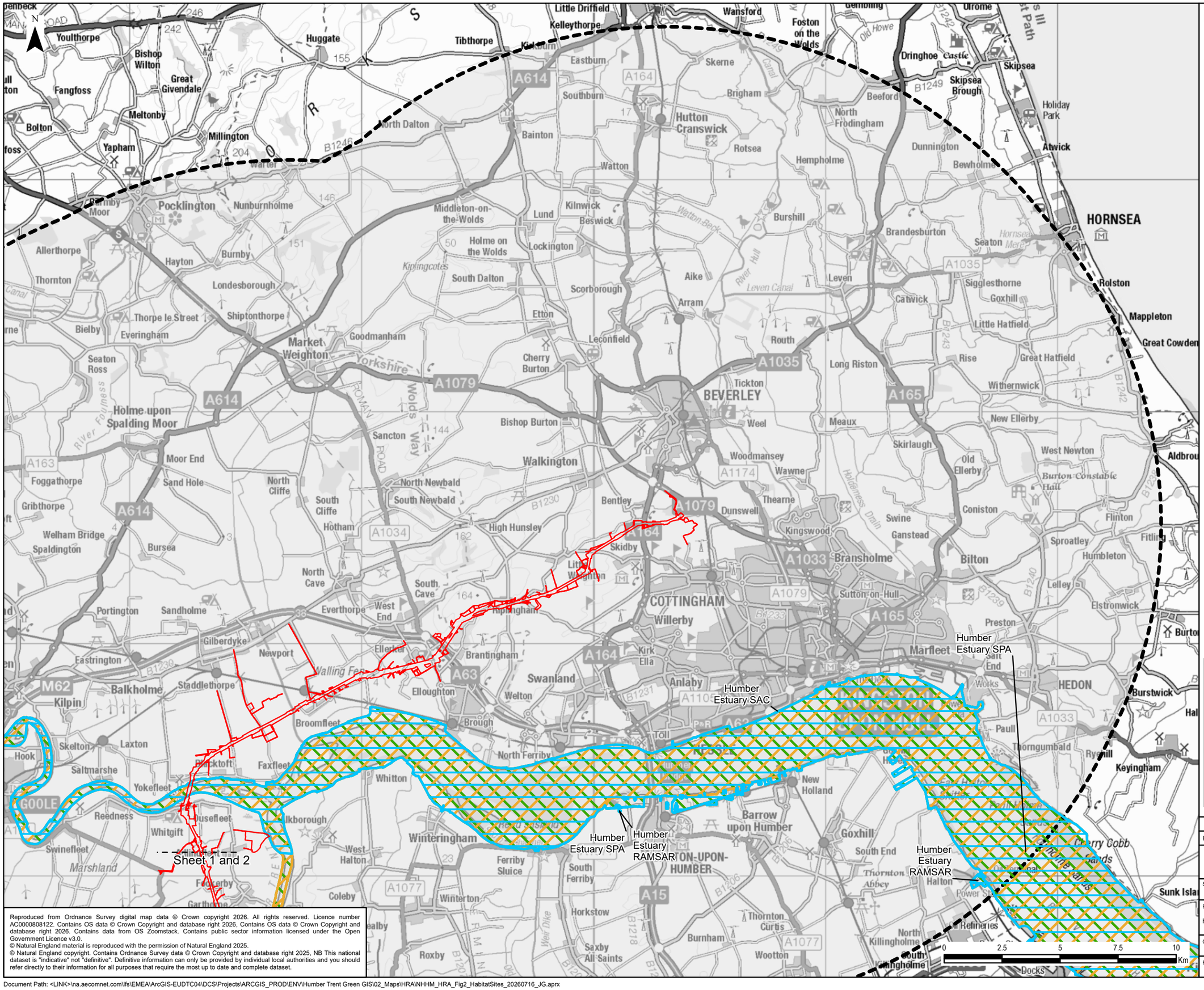
Scheme: NORTH HUMBER TO HIGH MARNHAM

Figure Title: FIGURE 1 - 13. APPENDIX A – LOCATION OF RELEVANT HABITATS SITES IN RELATION TO THE PROJECT (SCREENING)

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Rev	Date	Description	ID	JG	LR
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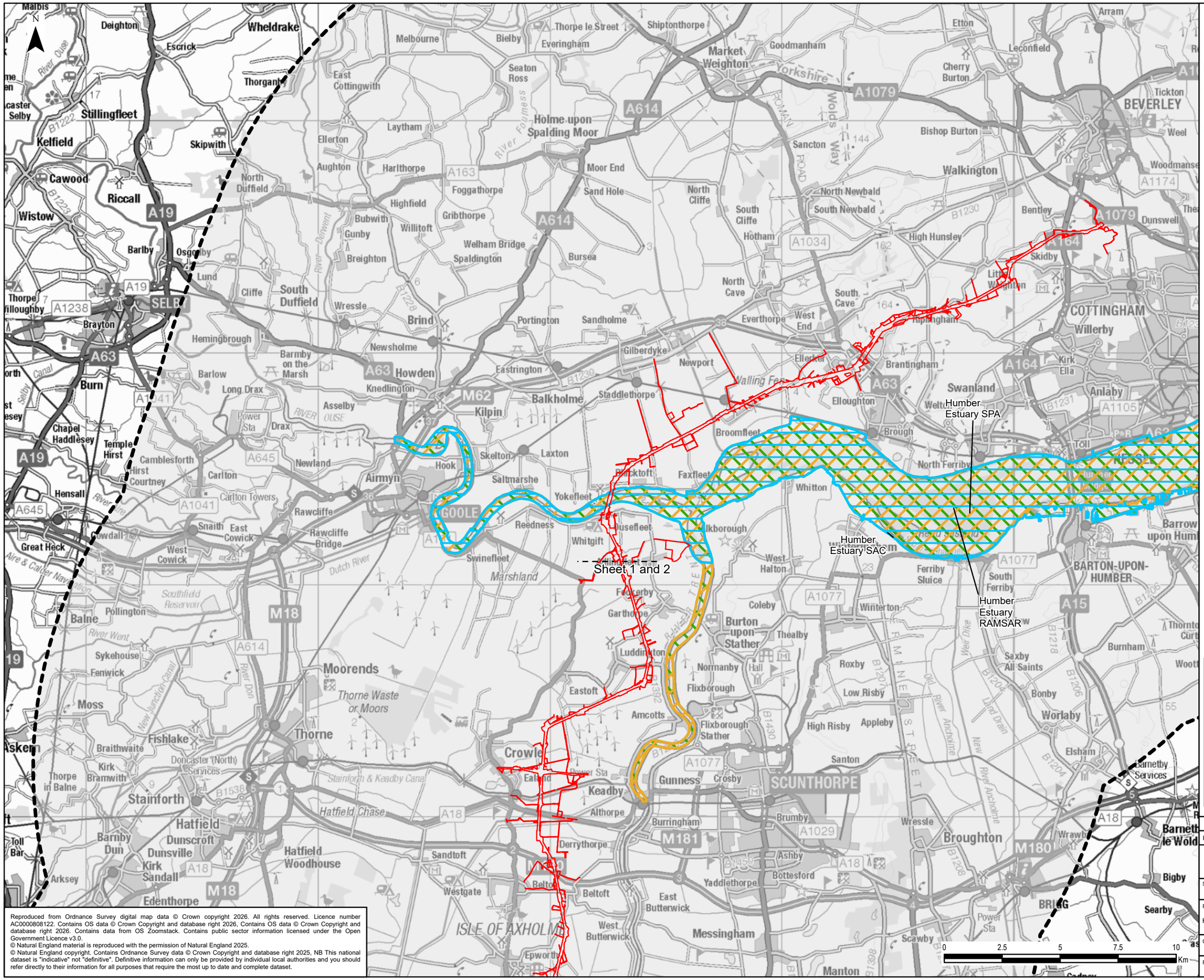
Scheme: NORTH HUMBER TO HIGH MARNHAM

Figure Title: FIGURE 2 - APPENDIX – LOCATION OF RELEVANT HABITATS SITES IN RELATION TO APPROPRIATE ASSESSMENT

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Document Path: <LINK>\na.aecomnet.com\lfs\EMEA\ArcGIS-EUDTC04\DCS\Projects\ARCGIS_PROD\ENV\Humber Trent Green GIS\02_Maps\HRA\NHHM_HRA_Fig2_HabitatSites_20260716_JG.aprx


Sheet 1 and 2
Humber Estuary SPA
Humber Estuary SAC
Humber Estuary RAMSAR
0 2.5 5 7.5 10 Km
Malbis
Deighton
Wheldrake
Escrick
Thorganby
Stillingfleet
Kelfield
Skipwith
Cawood
Riccall
Wistow
Barlby
Osgodby
Selby
Thorpe Willoughby
Brayton
Hemingbrough
Burn
Chapel Haddlesey
Temple Hirst
Camblesforth
Carlton
Hensall
Great Heck
Pollington
Balne
Sykehouse
Fenwick
Moss
Fishlake
Braithwaite
Kirk Bramwith
Thorpe in Balne
Stainforth
Hatfield
Barnby Dun
Dunscroft
Dunsville
Kirk Sandall
Arksey
Edenthorpe
Toll Bar
Doncaster (North) Services
Thorne
Moorends
Thorne Waste or Moors
Crowle
Ealand
Keadby
Althorpe
Gunness
Crosby
SCUNTHORPE
Burringham
Derrythorpe
Sandtoft
Westgate
Belton
Beltoft
East Butterwick
West Butterwick
Messingham
ISLE OF AXHOLME
Epworth
Hatfield Woodhouse
Hatfield Chase
Stainforth & Keadby Canal
Rawcliffe
Rawcliffe Bridge
Snaith
East Cowick
West Cowick
Carlton Towers
Newland
Airmyn
Swinefleet
Marshland
Reedness
Whitgift
Hook
Saltmarshe
Yokefleet
GOOLE
Rawcliffe
Dutch River
Aire & Calder Navigation
Southfield Reservoir
Skelton
Laxton
Faxfleet
Blacktoft
Ousefleet
Asselby
Drax
Power Sta
Barlow
Long Drax
Knedlington
Howden
Barmby on the Marsh
Newsholme
Wressle
Brind
Cliffe
South Duffield
Lund
Osgodby
Barlby
Riccall
Cawood
Wistow
Kelfield
Stillingfleet
Escrick
Deighton
Malbis
Ellerton
Aughton
Laytham
East Cottingwith
Melbourne
Bielby
Everingham
Thorpe le Street
Shiptonthorpe
Market Weighton
Goodmanham
Holme upon Spalding Moor
Seaton Ross
Harlthorpe
Foggathorpe
Moor End
Sand Hole
Highfield
Gribthorpe
Willitoft
Bubwith
Gunby
Breighton
Welham Bridge
Spaldington
Bursea
Portington
Sandholme
Eastrington
Gilberdyke
Newport
Balkholme
Kilpin
Staddlethorpe
Asselby
Broomfleet
Skelton
Laxton
Saltmarshe
Yokefleet
Reedness
Whitgift
Ousefleet
Faxfleet
Blacktoft
Whitton
Ferriby Sluice
Ferriby
North Ferriby
Brough
Ellerker
Ellerton
Everthorpe
West End
North Cave
South Cave
Hotham
North Cliffe
South Cliffe
Sancton
North Newbald
South Newbald
Bishop Burton
Cherry Burton
Etton
Leconfield
Arram
Beverley
Tickton
Walkington
Bentley
Dunswell
Woodmansey
High Hunsley
Skidby
Little Weighton
Riplingham
Cottingham
Willerby
Kirk Ella
Anlaby
Swanland
Brantingham
Elloughton
Broomfleet
Welton
Melton
Barrow upon Humber
Barton-upon-Humber
South Ferriby
Winterton
Coleby
Thealby
Burton upon Stather
Normanby Hall
Flixborough
Flixborough Stather
Luddington
Garthorpe
Fockerby
Eastoft
Amcotts
Roxby
Low Risby
High Risby
Appleby
Saxby All Saints
Bonby
Worlaby
Elsham
Barnetby Services
Barnetby le Wold
Bigby
Searby
Scawby
Brigg
Broughton
Wrawby
Ashby
Bottesford
Yaddlethorpe
Brumby
Santon
Manton
Crosby
Gunness
Power Sta
Ealand
Keadby
Althorpe
Burringham
Derrythorpe
Sandtoft
Westgate
Belton
Beltoft
East Butterwick
West Butterwick
Messingham
Scawby
Manton
Wrawby
Barnetby Services
Barnetby le Wold
Bigby
Sear

Appendix B
European site details

nationalgrid

Appendix B
European Site Details

B.1 Table B-1 Summary of impact pathways for each European site and stage of the Project

B.2 Table B-2 Qualifying Features

Table B.1 – Summary of impact pathways for each European site and stage of the Project

HRA stage	Phase of Project	Impact pathway	European sites considered
Screening	Construction	Loss of functionally linked land	Humber Estuary SPA (UK9006111)
			Humber Estuary Ramsar site (UK11031)
			Thorne and Hatfield Moors SPA (UK9005171)
		Waterborne pollution	Humber Estuary SAC (UK0030170)
			Humber Estuary SPA (UK9006111)
			Humber Estuary Ramsar site (UK11031)
		Airborne pollution	Humber Estuary SAC (UK0030170)
			Humber Estuary SPA (UK9006111)
			Humber Estuary Ramsar site (UK11031)
		Hydrological changes	Humber Estuary SAC (UK0030170)
			Humber Estuary SPA (UK9006111)
			Humber Estuary Ramsar site (UK11031)
		Disturbance of qualifying features	Humber Estuary SAC (UK0030170)
			Humber Estuary SPA (UK9006111)
			Humber Estuary Ramsar site (UK11031)

HRA stage	Phase of Project	Impact pathway	European sites considered
		Spread of INNS	Humber Estuary SAC (UK0030170)
			Humber Estuary SPA (UK9006111)
			Humber Estuary Ramsar site (UK11031)
	Operation and maintenance	Loss of functionally linked land	Humber Estuary SAC (UK0030170)
			Humber Estuary SPA (UK9006111)
			Humber Estuary Ramsar site (UK11031)
		Waterborne pollution	Humber Estuary SAC (UK0030170)
			Humber Estuary SPA (UK9006111)
			Humber Estuary Ramsar site (UK11031)
		Airborne pollution	Humber Estuary SAC (UK0030170)
			Humber Estuary SPA (UK9006111)
			Humber Estuary Ramsar site (UK11031)
		Hydrological changes	Humber Estuary SAC (UK0030170)
			Humber Estuary SPA (UK9006111)
			Humber Estuary Ramsar site (UK11031)

HRA stage	Phase of Project	Impact pathway	European sites considered
		Disturbance of qualifying features	Humber Estuary SAC (UK0030170)
			Humber Estuary SPA (UK9006111)
			Humber Estuary Ramsar site (UK11031)
		Barriers to movement	Humber Estuary SAC (UK0030170)
			Humber Estuary SPA (UK9006111)
			Humber Estuary Ramsar site (UK11031)
			Thorne and Hatfield Moors SPA (UK9005171)
		Injury/mortality	Humber Estuary SPA (UK9006111)
			Humber Estuary Ramsar site (UK11031)
			Thorne and Hatfield Moors SPA (UK9005171)
Appropriate Assessment	Construction	Loss of functionally linked land	Humber Estuary SPA (UK9006111)
			Humber Estuary Ramsar site (UK11031)
		Airborne pollution	Humber Estuary SAC (UK0030170)
			Humber Estuary SPA (UK9006111)
			Humber Estuary Ramsar site (UK11031)

HRA stage	Phase of Project	Impact pathway	European sites considered
		Disturbance of qualifying features	Humber Estuary SPA (UK9006111)
			Humber Estuary Ramsar site (UK11031)
	Operation and maintenance	Loss of functionally linked land	Humber Estuary SPA (UK9006111)
			Humber Estuary Ramsar site (UK11031)
		Barriers to movement	Humber Estuary SPA (UK9006111)
			Humber Estuary Ramsar site (UK11031)
		Injury/mortality	Humber Estuary SPA (UK9006111)
			Humber Estuary Ramsar site (UK11031)

Table B.2 – Qualifying Features

European sites	Qualifying features
Humber Estuary SPA (UK9006111)	The site qualifies as an SPA (Natural England, 2007) under article 4.1 of the Birds Directive (The European Parliament & the Council of the European Union, 2009), 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: • Avocet (*Recurvirostra avosetta*) – wintering and breeding; • Bittern (*Botaurus stellaris*) – wintering and breeding; • Hen harrier (*Circus cyaneus*) – wintering; • Golden plover (*Pluvialis apricaria*) – wintering; • Bar-tailed godwit (*Limosa lapponica*) – wintering; • Ruff (*Philomachus pugnax*) – passage;

European sites	Qualifying features
	• Marsh harrier (*Circus aeruginosus*) – breeding; and • Little tern (*Sterna albifrons*) – breeding. The site qualifies under article 4.2 of the Birds Directive (The European Parliament & the Council of the European Union, 2009), 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: • Shelduck (*Tadorna tadorna*) – wintering; • Knot (*Calidris canutus*) – wintering and passage; • Dunlin (*Calidris alpina*) – wintering and passage; • Black-tailed godwit (*Limosa limosa*) – wintering and passage; and • Redshank (*Tringa totanus*) – wintering and passage. The site qualifies under article 4.2 of the Birds Directive (The European Parliament & the Council of the European Union, 2009), as it is used regularly by over 20,000 waterbirds (waterbirds as defined by the Ramsar Convention) in any season: • Assemblage qualification: — In the non-breeding season, the area regularly supports 153,934 individual waterbirds, including dark-bellied brent goose (*Branta bernicla bernicla*), shelduck, wigeon (*Anas penelope*), teal (*Anas crecca*), mallard (*Anas platyrhynchos*), pochard (*Aythya ferina*), scaup (*Aythya marila*), goldeneye (*Bucephala clangula*), bittern, oystercatcher (*Haematopus ostralegus*), avocet, ringed plover (*Charadrius hiaticula*), golden plover (*Pluvialis apricaria*), grey plover (*P. squatarola*), lapwing (*Vanellus vanellus*), knot, sanderling (*C. alba*), dunlin, ruff, black-tailed godwit, bar-tailed godwit (*L. lapponica*), whimbrel (*Numenius phaeopus*), curlew (*N. arquata*), redshank, greenshank (*Tringa nebularia*) and turnstone (*Arenaria interpres*). Natural England recommends focusing on what are referred to as the 'main component species' of the assemblage (Natural England, 2024). The assemblage qualification is therefore subject to change as species' populations change. It should be noted that species listed on the citation under the assemblage features, whose populations have fallen to less than 1% of the national population, retain their status as a main component species and should be considered when assessing the impacts of a project or plan on the Humber Estuary SPA.

European sites	Qualifying features
	Natural England advises that the main component species of the Humber Estuary SPA non-breeding waterbird assemblage include: • Species listed individually under the assemblage feature on the SPA citation (Natural England, 2007): — Avocet – non-breeding; — Bar-tailed godwit – non-breeding; — Bittern – non-breeding; — **Black-tailed godwit**[1] – non-breeding; — **Brent goose**[1] – non-breeding; — **Curlew**[1] – non-breeding; — **Dunlin**[1] – non-breeding; — **Golden plover**[1] – non-breeding; — Goldeneye – non-breeding; — Greenshank – non-breeding; — Grey plover – non-breeding; — Knot – non-breeding; — **Lapwing**[1] – non-breeding; — **Mallard**[1] – non-breeding; — Oystercatcher – non-breeding; — Pochard – non-breeding; — **Redshank**[1] – non-breeding; — Ringed plover – non-breeding;

European sites	Qualifying features
	— **Ruff**[1] – non-breeding; — Sanderling – non-breeding; — Scaup – non-breeding; — **Shelduck**[1] – non-breeding; — **Teal**[1] – non-breeding — Turnstone – non-breeding; — **Whimbrel**[1] – non-breeding; and — Wigeon – non-breeding. • Species which are not listed on the SPA citation (Natural England, 2007) but occur at site levels of more than 1% of the national population, according to the most recent Humber Estuary Wetland Bird Survey (WeBS) 5-year average count: — Green sandpiper (*Tringa ochropus*) – non-breeding; — **Greylag goose** (*Anser anser*)[1] – non-breeding; — **Little egret** (*Egretta garzetta*)[1] – non-breeding; — **Pink-footed goose** (*Anser brachyrhynchus*)[1] – non-breeding; — Shoveler (*Anas clypeata*) – non-breeding; and — **Crane** (*Grus grus*)[1] – non-breeding. Some species, such as **snipe** (*Gallinago gallinago*), **Jack snipe** (*Lymnocryptes minimus*) and **water rail** (*Rallus aquaticus*), have known undercounts in the WeBS data. Therefore, high counts of these species should also be considered. Natural England also specify the need to consider potential impacts on species which are not considered to be non-breeding waterbirds but are listed on the citation qualifying under articles 4.1 and 4.2 of the Birds Directive (The European Parliament & the Council of the European Union, 2009). These include:

European sites	Qualifying features
	• **Hen harrier**[1] – non-breeding; • **Marsh harrier**[1] – breeding; • Little tern – breeding; • Avocet – breeding; and • Bittern – breeding. The species **marked 1 in bold text** are known to use off-site supporting habitat/FLL (e.g., arable farmland, grassland/pasture, and/or non-estuarine waterbodies) in the non-breeding season and may therefore be the most relevant for assessing potential impacts of a proposed project on birds using FLL associated with the Humber Estuary SPA.
Humber Estuary Ramsar site (UK11031)	The site qualifies as a Ramsar site for the following reasons (JNCC, 2007): • Ramsar criterion 1 – The site is a representative example of a near-natural estuary with the following component habitats: dune systems and humid dune slacks, estuarine waters, intertidal mud and sand flats, saltmarshes, and coastal brackish/saline lagoons. • Ramsar criterion 3 – The Humber Estuary Ramsar site supports a breeding colony of grey seals at Donna Nook. It is the second largest grey seal colony in England and the furthest south regular breeding site on the east coast. The dune slacks at Saltfleetby-Theddlethorpe on the southern extremity of the Ramsar site are the most north-easterly breeding site in Great Britain of the natterjack toad (*Epidalea calamita*). • Ramsar criterion 5 – Assemblages of international importance: 153,934 waterfowl, non-breeding season. • Ramsar criterion 6 – Species/populations occurring at levels of international importance: — Golden plover – passage and wintering; — Knot – passage and wintering; — Dunlin – passage and wintering; — Black-tailed godwit – passage and wintering; — Redshank – passage and wintering; — Shelduck – wintering; and

European sites	Qualifying features
	— Bar-tailed godwit – wintering. • Ramsar criterion 8 – The Humber Estuary acts as an important migration route for both river lamprey and sea lamprey between coastal waters and their spawning areas.
Thorne and Hatfield Moors SPA (UK9005171)	The site qualifies as an SPA (Natural England, 2011) under article 4.1 of the Birds Directive (The European Parliament & the Council of the European Union, 2009), as it is used regularly by 1% or more of the Great Britain population of a species listed in Annex 1 in any season: • Nightjar (*Caprimulgus europaeus*) – breeding.
Humber Estuary SAC (UK0030170)	The site is designated as a SAC for the following reasons (JNCC, 2007): • Annex I habitats listed under article 4(4) of the Habitats Directive 1992 (Council of the European Communities, 1992) that are a primary reason for selection of this site: — Estuaries; and — Mudflats and sandflats not covered by seawater at low tide. • Annex I habitats present as a qualifying feature, but not a primary reason for selection of this site (* Priority feature): — Sandbanks which are slightly covered by sea water all the time; — Coastal lagoons*; — *Salicornia* and other annuals colonising mud and sand; — Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*); — Embryonic shifting dunes; — “Shifting dunes along the shoreline with *Ammophila arenaria* (“white dunes”)”; — “Fixed coastal dunes with herbaceous vegetation (“grey dunes”)”*; and — Dunes with Hippophae rhamnoides.

European sites	Qualifying features
	• Annex II species listed under article 4(4) of the Habitats Directive 1992 (Council of the European Communities, 1992) present as a qualifying feature, but not a primary reason for site selection: — Sea lamprey (Petromyzon marinus); — River lamprey (Lampetra fluviatilis); and — Grey seal (Halichoerus grypus).

Appendix C Citations/Natura 2000 Data Sheets for Relevant European sites

nationalgrid

Appendix C
Citations/Natura 2000 Data Sheets for Relevant European sites

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 **UK9006092**

SITENAME **Lower Derwent Valley**

TABLE OF CONTENTS

- 1. SITE IDENTIFICATION
- 2. SITE LOCATION
- 3. ECOLOGICAL INFORMATION
- 4. SITE DESCRIPTION
- 5. SITE PROTECTION STATUS AND RELATION WITH CORINE BIOTOPES
- 6. SITE MANAGEMENT

1. SITE IDENTIFICATION

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1.1 Type	1.2 Site code
A	UK9006092

1.3 Site name

Lower Derwent Valley

1.4 First Compilation date	1.5 Update date
1993-06	2015-12

1.6 Respondent:

Name/Organisation:	Joint Nature Conservation Committee
Address:	Joint Nature Conservation Committee Monkstone House City Road Peterborough PE1 1JY
Email:	

1.7 Site indication and designation / classification dates

Date site classified as SPA:	1993-06
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
-0.926111111	53.88444444

2.2 Area [ha]:

1090.87

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
UKE2	North Yorkshire
UKE1	East Yorkshire and Northern Lincolnshire

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.	G
B	A056	Anas clypeata			r	50	50	p		G	B		C	
B	A052	Anas crecca			w	10	10	Bfemales		G	B		C	
B	A050	Anas penelope			w	9323	9323	i		G	B		C	
B	A037	Cygnus columbianus bewickii			w	47	47	i		G	C		C	
B	A151	Philomachus pugnax			w	133	133	i		G	A		C	
B	A140	Pluvialis apricaria			w	6000	6000	i		G	B		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			40616	40616	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
N07	24.0
N10	65.0
N16	1.0
N06	10.0
Total Habitat Cover	100

Other Site Characteristics

1 Terrestrial: Soil & Geology: sedimentary,neutral,clay,sand,alluvium,nutrient-poor,peat 2 Terrestrial: Geomorphology and landscape: floodplain,valley,lowland

4.2 Quality and importance

ARTICLE 4.1 QUALIFICATION (79/409/EEC) Over winter the area regularly supports: Cygnus columbianus bewickii (Western Siberia/North-eastern & North-western Europe) 0.7% of the GB population 5 year peak mean 1991/92-1995/96 Philomachus pugnax (Western Africa - wintering) 19% of the GB population 5 year peak mean 1991/92-1995/96 Pluvialis apricaria [North-western Europe - breeding] 2.4% of the GB population 5 year peak mean 1991/92-1995/96 ARTICLE 4.2 QUALIFICATION (79/409/EEC) During the breeding season

the area regularly supports: Anas clypeata (North-western/Central Europe) 5% of the population in Great Britain 5 year mean 1986/7-1990/1 Over winter the area regularly supports: Anas crecca (North-western Europe) 1.5% of the population 5 year peak mean 1991/92-1995/96 Anas penelope (Western Siberia/North-western/North-eastern Europe) 0.7% of the population 5 year peak mean 1991/92-1995/96 ARTICLE 4.2 QUALIFICATION (79/409/EEC): AN INTERNATIONALLY IMPORTANT ASSEMBLAGE OF BIRDS Over winter the area regularly supports: 40616 waterfowl (5 year peak mean 1991/92-1995/96) Including: Cygnus columbianus bewickii , Anas penelope , Anas crecca , Pluvialis apricaria [North-western Europe - breeding], Philomachus pugnax

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	J02		B
H	A04		I
H	G01		I
H	K02		I
H	I01		B

Positive Impacts			
Rank	Activities, management [code]	Pollution (optional) [code]	inside/outside [i|o|b]
H	D05		I
H	A04		I
H	A03		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	UK01	45.4		

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
☒	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

EC Directive 79/409 on the Conservation of Wild Birds
Special Protection Area (SPA)

Name: Humber Estuary

Unitary Authorities/Counties: City of Kingston-upon-Hull, East Riding of Yorkshire, Lincolnshire, North East Lincolnshire, North Lincolnshire

Component SSSIs: The SPA encompasses all or parts of the following Sites of Special Scientific Interest (SSSIs): Humber Estuary SSSI, North Killingholme Haven Pits SSSI, Saltfleetby-Theddlethorpe Dunes SSSI, and The Lagoons SSSI.

Site description: The Humber Estuary is located on the east coast of England, and comprises extensive wetland and coastal habitats. The inner estuary supports extensive areas of reedbed, with areas of mature and developing saltmarsh backed by grazing marsh in the middle and outer estuary. On the north Lincolnshire coast, the saltmarsh is backed by low sand dunes with marshy slacks and brackish pools. Parts of the estuary are owned and managed by conservation organisations. The estuary supports important numbers of waterbirds (especially geese, ducks and waders) during the migration periods and in winter. In summer, it supports important breeding populations of bittern *Botaurus stellaris*, marsh harrier *Circus aeruginosus*, avocet *Recurvirostra avosetta* and little tern *Sterna albifrons*.

Size of SPA: The SPA covers an area of 37,630.24 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 I species	Count and season	Period	% of GB population
Avocet *Recurvirostra avosetta*	59 individuals – wintering	5 year peak mean 1996/97 – 2000/01	1.7%
Bittern *Botaurus stellaris*	4 individuals – wintering	5 year peak mean 1998/99 – 2002/03	4.0%
Hen harrier *Circus cyaneus*	8 individuals – wintering	5 year peak mean 1997/98 – 2001/02	1.1%
Golden plover *Pluvialis apricaria*	30,709 individuals – wintering	5 year peak mean 1996/97 – 2000/01	12.3%
Bar-tailed godwit *Limosa lapponica*	2,752 individuals – wintering	5 year peak mean 1996/97 – 2000/01	4.4%
Ruff *Philomachus pugnax*	128 individuals – passage	5 year peak mean 1996-2000	1.4%
Bittern *Botaurus stellaris*	2 booming males – breeding	3 year mean 2000-2002	10.5%
Marsh harrier *Circus aeruginosus*	10 females – breeding	5 year mean 1998-2002	6.3%
Avocet *Recurvirostra avosetta*	64 pairs – breeding	5 year mean 1998 – 2002	8.6%
Little tern *Sterna albifrons*	51 pairs – breeding	5 year mean 1998-2002	2.1%

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
Shelduck *Tadorna tadorna*	4,464 individuals – wintering	5 year peak mean 1996/97 – 2000/01	1.5% Northwestern Europe (breeding)
Knot *Calidris canutus*	28,165 individuals – wintering	5 year peak mean 1996/97 – 2000/01	6.3% *islandica*
Dunlin *Calidris alpina*	22,222 individuals – wintering	5 year peak mean 1996/97 – 2000/01	1.7% *alpina*, Western Europe (non-breeding)
Black-tailed godwit *Limosa limosa*	1,113 individuals – wintering	5 year peak mean 1996/97 – 2000/01	3.2% *islandica*
Redshank *Tringa totanus*	4,632 individuals – wintering	5 year peak mean 1996/97 – 2000/01	3.6% *brittanica*
Knot *Calidris canutus*	18,500 individuals – passage	5 year peak mean 1996 – 2000	4.1% *islandica*
Dunlin *Calidris alpina*	20,269 individuals – passage	5 year peak mean 1996 – 2000	1.5% *alpina*, Western Europe (non-breeding)
Black-tailed godwit *Limosa limosa*	915 individuals – passage	5 year peak mean 1996 – 2000	2.6% *islandica*
Redshank *Tringa totanus*	7,462 individuals – passage	5 year peak mean 1996 – 2000	5.7% *brittanica*

Bird counts from: Wetland Bird Survey (WeBS) database and *The Humber Estuary: A comprehensive review of its nature conservation interest* (Allen *et al.* 2003).

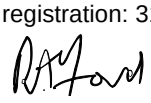
Assemblage qualification:
The site qualifies under **article 4.2** of the Directive (79/409/EEC) as it is used regularly by over 20,000 waterbirds (waterbirds as defined by the Ramsar Convention) in any season:

In the non-breeding season, the area regularly supports 153,934 individual waterbirds (five year peak mean 1996/97 – 2000/01), including dark-bellied brent goose *Branta bernicla bernicla*, shelduck *Tadorna tadorna*, wigeon *Anas penelope*, teal *Anas crecca*, mallard *Anas platyrhynchos*, pochard *Aythya ferina*, scaup *Aythya marila*, goldeneye *Bucephala clangula*, bittern *Botaurus stellaris*, oystercatcher *Haematopus ostralegus*, avocet *Recurvirostra avosetta*, ringed plover *Charadrius hiaticula*, golden plover *Pluvialis apricaria*, grey plover *P. squatarola*, lapwing *Vanellus vanellus*, knot *Calidris canutus*, sanderling *C. alba*, dunlin *C. alpina*, ruff *Philomachus pugnax*, black-tailed godwit *Limosa limosa*, bar-tailed godwit *L. lapponica*, whimbrel *Numenius phaeopus*, curlew *N. arquata*, redshank *Tringa totanus*, greenshank *T. nebularia* and turnstone *Arenaria interpres*.

Non-qualifying species of interest: The SPA is used by non-breeding merlin *Falco columbarius*, peregrine *F. peregrinus* and short-eared owl *Asio flammeus*, and breeding common tern *Sterna hirundo* and kingfisher *Alcedo atthis* (all species listed in Annex I to the EC Birds Directive) in numbers of less than European importance (less than 1% of the GB population).

Status of SPA:
1) Humber Flats, Marshes and Coast (Phase 1) SPA was classified on 28 July 1994.
2) The extended and renamed Humber Estuary SPA was classified on 31 August 2007.

This citation relates to a site entered in the Register of European Sites for Great Britain.
Register reference number: UK9006111
Date of registration: 31 August 2007

Signed: 

On behalf of the Secretary of State for Environment, Food and Rural Affairs

EC Directive 92/43 on the Conservation of Natural Habitats and of Wild Fauna and Flora

Citation for Special Area of Conservation (SAC)

Name:	Humber Estuary
Unitary Authority/County:	City of Kingston upon Hull, East Riding of Yorkshire, Lincolnshire, North East Lincolnshire, North Lincolnshire
SAC status:	Designated on 10 December 2009
Grid reference:	TA345110
SAC EU code:	UK0030170
Area (ha):	36657.15
Component SSSI:	Humber Estuary

Site description:
The Humber is the second largest coastal plain **Estuary** in the UK, and the largest coastal plain estuary on the east coast of Britain. The estuary supports a full range of saline conditions from the open coast to the limit of saline intrusion on the tidal rivers of the Ouse and Trent. The range of salinity, substrate and exposure to wave action influences the estuarine habitats and the range of species that utilise them; these include a breeding bird assemblage, winter and passage waterfowl, river and sea lamprey, grey seals, vascular plants and invertebrates.

The Humber is a muddy, macro-tidal estuary, fed by a number of rivers including the Rivers Ouse, Trent and Hull. Suspended sediment concentrations are high, and are derived from a variety of sources, including marine sediments and eroding boulder clay along the Holderness coast. This is the northernmost of the English east coast estuaries whose structure and function is intimately linked with soft eroding shorelines. The extensive mud and sand flats support a range of benthic communities, which in turn are an important feeding resource for birds and fish. Wave exposed sandy shores are found in the outer/open coast areas of the estuary. These change to the more moderately exposed sandy shores and then to sheltered muddy shores within the main body of the estuary and up into the tidal rivers.

Habitats within the Humber Estuary include **Atlantic salt meadows** and a range of sand dune types in the outer estuary, together with **Sandbanks which are slightly covered by sea water all the time**, extensive intertidal mudflats, ***Salicornia* and other annuals colonising mud and sand**, and **Coastal lagoons**. As salinity declines upstream, reedbeds and brackish saltmarsh communities fringe the estuary. These are best-represented at the confluence of the Rivers Ouse and Trent at Blacktoft Sands.

Upstream from the Humber Bridge, the navigation channel undergoes major shifts from north to south banks, for reasons that have yet to be fully explained. This section of the estuary is also noteworthy for extensive mud and sand bars, which in places form semi-permanent islands. The sand dunes are features of the outer estuary on both the north and south banks particularly on Spurn peninsula and along the Lincolnshire coast south of Cleethorpes. Examples of both **Fixed dunes with herbaceous vegetation (`grey dunes`)** and **Shifting dunes along the shoreline with *Ammophila arenaria* (`white dunes)** occur on both banks of the estuary and along the coast. Native sea buckthorn **Dunes with *Hippophae rhamnoides*** also occurs on both sides of the estuary.

Significant fish species include **river lamprey** *Lampetra fluviatilis* and **sea lamprey** *Petromyzon marinus* which breed in the River Derwent, a tributary of the River Ouse. **Grey seals** *Halichoerus grypus* come ashore in autumn to form breeding colonies on the sandy shores of the south bank at Donna Nook.

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:

- Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*)
- Coastal lagoons*
- Dunes with *Hippophae rhamnoides*
- Embryonic shifting dunes
- Estuaries
- Mudflats and sandflats not covered by seawater at low tide
- Fixed dunes with herbaceous vegetation (`grey dunes`)*
- *Salicornia* and other annuals colonising mud and sand
- Sandbanks which are slightly covered by sea water all the time
- Shifting dunes along the shoreline with *Ammophila arenaria* (`white dunes')

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:

- Grey seal *Halichoerus grypus*
- River lamprey *Lampetra fluviatilis*
- Sea lamprey *Petromyzon marinus*

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: UK0030170
Date of registration:10 December 2009

Signed: S G Hopkinson

On behalf of the Secretary of State for Environment, Food and Rural Affairs

EC Directive 79/409 on the Conservation of Wild Birds: Special Protection Area (SPA)

Name: Thorne and Hatfield Moors

Unitary Authority/County: Doncaster, East Riding of Yorkshire and North Lincolnshire

Consultation proposal: Thorne, Crowle and Goole Moors Site of Special Scientific Interest (SSSI) and Hatfield Moors SSSI have been recommended as a Special Protection Area because of their European ornithological importance.

Boundary of SPA: See SPA map.

Size of SPA: The SPA covers an area of 2,449.2 ha.

European ornithological importance of the SPA: Thorne and Hatfield Moors SPA is of European importance because:

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 population of a species listed in Annex 1 in any season:

Annex 1 species	5 year peak mean 1993 & 1995 - 1998	% GB population
Nightjar *Caprimulgus europaeus*	66 pairs - breeding	1.9% GB

Non-qualifying species of interest
The site also supports small numbers (at non-qualifying levels) of other Annex 1 species: Hen Harrier *Circus cyaneus*, Merlin *Falco columbarius* and Short-eared Owl *Asio flammeus* hunt over the site in winter and at least one pair of Hobbies *Falco subbuteo* feed over the site in summer. Also notable are Nightingales *Luscinia megarhynchos* breeding at one of their most northerly regular sites in Britain.

Data sources

Limbert, M., Mitchell, R.D., & Rhodes, R.J. 1986. *Thorne Moors Birds & Man.* Doncaster & District Ornithological Society.
Morris, A., Burges, D., Fuller, R.J., Evans, A.D., & Smith, K.W. 1994. The status and distribution of Nightjars *Caprimulgus europaeus* in Britain in 1992. *Bird Study* **41**: 181-191.
Roworth, P.C. 1992. A common bird census on Thorne Moors National Nature Reserve, South Yorkshire - a relic cut-over raised mire. *The Naturalist* **117**: 5-18.

Status of SPA
Thorne and Hatfield Moors was classified as a Special Protection Area on 16 August 2000.

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: 31 August 2007

3. Country:

UK (England)

4. Name of the Ramsar site:

Humber Estuary

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:

The boundary has been extended

** 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):

053 32 59 N 000 00 03 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: Kingston-upon-Hull

The Humber Estuary is located on the boundary between the East Midlands Region and the Yorkshire and the Humber Region, on the east coast of England bordering the North Sea.

Administrative region: City of Kingston upon Hull; East Riding of Yorkshire; Humberside; Lincolnshire; North East Lincolnshire; North Lincolnshire

10. Elevation (average and/or max. & min.) (metres): 11. Area (hectares): 37987.8

Min. -13
Max. 10
Mean No information available

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 Humber Estuary is the largest macro-tidal estuary on the British North Sea coast. It drains a catchment of some 24,240 square kilometres and is the site of the largest single input of freshwater from Britain into the North Sea. It has the second-highest tidal range in Britain (max 7.4 m) and approximately one-third of the estuary is exposed as mud or sand flats at low tide. The inner estuary supports extensive areas of reedbed with areas of mature and developing saltmarsh backed in places by limited areas of grazing marsh in the middle and outer estuary. On the north Lincolnshire coast the saltmarsh is backed by low sand dunes with marshy slacks and brackish pools. The Estuary regularly supports internationally important numbers of waterfowl in winter and nationally important breeding populations in summer.

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).

1, 3, 5, 6, 8

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 1

The site is a representative example of a near-natural estuary with the following component habitats: dune systems and humid dune slacks, estuarine waters, intertidal mud and sand flats, saltmarshes, and coastal brackish/saline lagoons.

It is a large macro-tidal coastal plain estuary with high suspended sediment loads, which feed a dynamic and rapidly changing system of accreting and eroding intertidal and subtidal mudflats, sandflats, saltmarsh and reedbeds. Examples of both strandline, foredune, mobile, semi-fixed dunes, fixed dunes and dune grassland occur on both banks of the estuary and along the coast. The estuary supports a full range of saline conditions from the open coast to the limit of saline intrusion on the tidal rivers of the Ouse and Trent. Wave exposed sandy shores are found in the outer/open coast areas of the estuary. These change to the more moderately exposed sandy shores and then to sheltered muddy shores within the main body of the estuary and up into the tidal rivers. The lower saltmarsh of the Humber is dominated by common cordgrass *Spartina anglica* and annual glasswort *Salicornia* communities. Low to mid marsh communities are mostly represented by sea aster *Aster tripolium*, common saltmarsh grass *Puccinellia maritima* and sea purslane *Atriplex portulacoides* communities. The upper portion of the saltmarsh community is atypical, dominated by sea couch *Elytrigia atherica* (*Elymus pycnanthus*) saltmarsh community. In the upper reaches of the estuary, the tidal marsh community is dominated by the common reed *Phragmites australis* fen and sea club rush *Bolboschoenus maritimus* swamp with the couch grass *Elytrigia repens (Elymus repens)* saltmarsh community. Within the Humber Estuary Ramsar site there are good examples of four of the five physiographic types of saline lagoon.

Ramsar criterion 3

The Humber Estuary Ramsar site supports a breeding colony of grey seals *Halichoerus grypus* at Donna Nook. It is the second largest grey seal colony in England and the furthest south regular breeding site on the east coast. The dune slacks at Saltfleetby-Theddlethorpe on the southern extremity of the Ramsar site are the most north-easterly breeding site in Great Britain of the natterjack toad *Bufo calamita*.

Ramsar criterion 5

Assemblages of international importance:

153,934 waterfowl, non-breeding season

(5 year peak mean 1996/97-2000/2001)

Ramsar criterion 6 – species/populations occurring at levels of international importance.

Eurasian golden plover, *Pluvialis apricaria*

altifrons subspecies – NW Europe, W Continental Europe, NW Africa population

17,996 individuals, passage, representing an average of 2.2% of the population

(5 year peak mean 1996-2000)

Red knot, *Calidris canutus*

islandica subspecies

18,500 individuals, passage, representing an average of 4.1% of the population

(5 year peak mean 1996-2000)

Dunlin, *Calidris alpina*
alpina subspecies – Western Europe (non-breeding) population
20,269 individuals, passage, representing an average of 1.5% of the population
(5 year peak mean 1996-2000)

Black-tailed godwit, *Limosa limosa*
islandica subspecies
915 individuals, passage, representing and average of 2.6% of the population
(5 year peak mean 1996-2000)

Common redshank, *Tringa totanus*
brittanica subspecies
7,462 individuals, passage, representing an average of 5.7% of the population
(5 year peak mean 1996-2000)

Common shelduck, *Tadorna tadorna*
Northwestern Europe (breeding) population
4,464 individuals, wintering, representing an average of 1.5% of the population
(5 year peak mean 1996/7-2000/1)

Eurasian golden plover, *Pluvialis apricaria*
altifrons subspecies – NW Europe, W Continental Europe, NW Africa population
30,709 individuals, wintering, representing an average of 3.8% of the population
(5 year peak mean 1996/7-2000/1)

Red knot, *Calidris canutus*
islandica subspecies
28,165 individuals, wintering, representing an average of 6.3% of the population
(5 year peak mean 1996/7-2000/1)

Dunlin, *Calidris alpina*
alpina subspecies – Western Europe (non-breeding) population
22,222 individuals, wintering, representing an average of 1.7% of the population
(5 year peak mean 1996/7-2000/1)

Black-tailed godwit, *Limosa limosa*
islandica subspecies
1,113 individuals, wintering, representing an average of 3.2% of the population
(5 year peak mean 1996/7-2000/1)

Bar-tailed godwit , *Limosa lapponica*
lapponica subspecies
2,752 individuals, wintering, representing an average of 2.3% of the population
(5 year peak mean 1996/7-2000/1)

Common redshank, *Tringa totanus*
brittanica subspecies
4,632 individuals, wintering, representing an average of 3.6% of the population
(5 year peak mean 1996/7-2000/1)

Ramsar criterion 8
The Humber Estuary acts as an important migration route for both river lamprey *Lampetra fluviatilis* and sea lamprey *Petromyzon marinus* between coastal waters and their spawning areas.

Ramsar criterion 5

Assemblages of international importance:

Species with peak counts in winter:
153934 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:

European golden plover , *Pluvialis apricaria apricaria*, P. a. altifrons Iceland & Faroes/E Atlantic	17996 individuals, representing an average of 2.2% of the population (1996-2000)
Red knot , *Calidris canutus islandica*, W & Southern Africa (wintering)	18500 individuals, representing an average of 4.1% of the population (1996-2000)
Dunlin , *Calidris alpina alpina*, W Siberia/W Europe	20269 individuals, representing an average of 1.5% of the population (1996-2000)
Black-tailed godwit , *Limosa limosa islandica*, Iceland/W Europe	915 individuals, representing an average of 2.6% of the population (1996-2000)
Common redshank , *Tringa totanus totanus*,	7462 individuals, representing an average of 5.7% of the population (1996-2000)

Species with peak counts in winter:

Common shelduck , *Tadorna tadorna*, NW Europe	4464 individuals, representing an average of 1.5% of the population (1996/7 to 2000/1)
European golden plover , *Pluvialis apricaria apricaria*, P. a. altifrons Iceland & Faroes/E Atlantic	30709 individuals, representing an average of 3.8% of the population (1996/7 to 2000/1)
Red knot , *Calidris canutus islandica*, W & Southern Africa (wintering)	28165 individuals, representing an average of 6.3% of the population (1996/7 to 2000/1)
Dunlin , *Calidris alpina alpina*, W Siberia/W Europe	22222 individuals, representing an average of 1.7% of the population (1996/7 to 2000/1)

Black-tailed godwit , *Limosa limosa islandica*, Iceland/W Europe	1113 individuals, representing an average of 3.2% of the population (1996/7 to 2000/1)
Bar-tailed godwit , *Limosa lapponica lapponica*, W Palearctic	2752 individuals, representing an average of 2.3% of the population (1996/7 to 2000/1)

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.
See Sections 21/22 for details of noteworthy species
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	neutral, shingle, sand, mud, clay, alluvium, sedimentary, sandstone, sandstone/mudstone, limestone/chalk, gravel, nutrient-rich
Geomorphology and landscape	lowland, coastal, floodplain, shingle bar, intertidal sediments (including sandflat/mudflat), estuary, islands, cliffs
Nutrient status	eutrophic
pH	circumneutral
Salinity	brackish / mixosaline, fresh, saline / euhaline
Soil	mainly mineral
Water permanence	usually permanent
Summary of main climatic features	Annual averages (Cleethorpes, 1971–2000) (www.metoffice.com/climate/uk/averages/19712000/sites/cleethorpes.html) Max. daily temperature: 13.1° C Min. daily temperature: 6.4° C Days of air frost: 29.0 Rainfall: 565.4 mm Hrs. of sunshine: 1521.9

General description of the Physical Features:

The Humber estuary is approximately 70 km long from the limit of saline intrusion on the River Ouse at Boothferry to the estuary mouth at Spurn Head, where it enters the North Sea. The area of the estuary is approx. 365 km2, and it has a width of 6.6 km at the mouth.

The Humber is a macro-tidal estuary with a tidal range of 7.4 m, the second-largest range in the UK and comparable to other macro-tidal estuaries worldwide. It is a shallow and well mixed estuary, with an average depth of 6.5m rising to 13.2 m at the mouth.

The Humber is the second-largest coastal plain estuary in the UK, and the largest coastal plain estuary on the east coast of Britain. Suspended sediment concentrations are high, and are derived from a variety of sources, including marine sediments and eroding boulder clay along the Holderness coast. This is the northernmost of the English east coast estuaries whose structure and function is intimately linked with soft eroding shorelines.

Upstream from the Humber Bridge, the navigation channel undergoes major shifts from north to south banks. This section of the estuary is noteworthy for extensive mud and sand bars, which in places form semi-permanent islands.

The estuary covers the full salinity range from fully marine at the mouth of the estuary (Spurn Head) to the limit of saline intrusion on the Rivers Ouse and Trent)). A salinity gradient from north to south bank is observed in the outer estuary, due to the incoming tide flowing along the north bank, while the fresh water keeps to the south bank as it discharges to the sea. As salinity declines upstream, reedbeds and brackish saltmarsh communities fringe the estuary..

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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 Humber catchment covers an area of ca. 24,240 km2, more than 20% of the land area of England. Average annual precipitation in the upland areas of the catchment is as much as 1000 mm. Average freshwater flow into the Humber estuary from the rivers is 250 m3s-1, ranging from 60 m3s-1 in drier periods to 450 m3s-1 in wet periods. Peak flows of up to 1500 m3s-1 have been recorded during floods. The rivers Trent and Ouse, which provide the main fresh water flow into the Humber, drain large industrial and urban areas to the south and west (River Trent), and less densely populated agricultural areas to the north and west (River Ouse). The Trent/Ouse confluence is known as Trent Falls.

On the north bank of the Humber estuary the principal river is the river Hull, which flows through the city of Kingston-upon-Hull, and has a tidal length of 32 km, up to the Hempholme Weir. The Hull provides only about 1% of the freshwater input to the estuary. On the south bank, the River Ancholme enters the Humber at South Ferriby, but the tide is excluded by a sluice and a tidal lock. Altogether, the total tidal length of rivers and estuary is 313 km.

There are several major urban centres within the river catchments. Nottingham, Leicester, and the West Midlands/Birmingham conurbation are drained by the Trent, the Leeds-Bradford area in West Yorkshire is drained by the Aire/Calder and the Sheffield/Rotherham/Doncaster area in South Yorkshire is drained by the Don. There are also large rural regions, whose populations are currently experiencing high population growth, while the urban areas are showing a small decline. The 1992 population for the Ouse catchment was 4.1 million, and for the Trent catchment was 7.1 million. The population of Humberside, which comprises North and North-east Lincolnshire, the East Riding of Yorkshire, and Kingston-upon-Hull (Hull), was just under 0.9 million. Land use around the estuary itself is 50-98% agricultural, within only two areas of high population/ industry – the major conurbation around Kingston-upon-Hull (Hull) on the north bank, and several large industrial areas around Grimsby/ Immingham/ Cleesthorpes on the south bank.

The area around the Humber estuary is low-lying, and much land-claim of wetlands and supratidal zones, as well as parts of the intertidal zone, was carried out in the past two centuries. The mid to

outer estuary (Humber Bridge to Spurn Point) changed from a region of low water erosion in the 19th century to one of accretion in the 20th century, nonetheless a net loss of intertidal zone of some 3000 ha has taken place since the mid-19th century. Around the estuary some 894 km2 of land are below the 5 m contour, protected by extensive coastal defences. Most of the sediment entering the estuary comes from the North Sea, and a large part of it is believed to come from the continuing erosion of the Holderness Cliffs, which form the coastline to the north of the estuary mouth at Spurn Head. The estuary currently has approximately 1,775 ha of saltmarsh

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:

Marine/coastal wetland

Code	Name	% Area
F	Estuarine waters	66.8
G	Tidal flats	26.4
H	Salt marshes	4.7
E	Sand / shingle shores (including dune systems)	0.8
7	Gravel / brick / clay pits	0.5
Q	Saline / brackish lakes: permanent	0.3
J	Coastal brackish / saline lagoons	0.3
Other	Other	0.1
9	Canals and drainage channels	0.01
Y	Freshwater springs	0.01

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.

Description

Much of the intertidal area of the Humber Estuary consists of mudflats with fringing saltmarsh. There are smaller areas of intertidal sand flats, and sand dunes. The saltmarsh is both eroding and accreting; although coastal squeeze is resulting in net losses, and cord grass Spartina anglica is a major colonising species. In areas of reduced salinity such as the Upper Humber there are extensive areas of common reed Phragmites australis with some sea club-rush Bolboschoenus maritimus. Mid-level saltmarsh tends to be much more floristically diverse, and in the higher level marsh with its dendritic network of drainage channels, salt pans and borrow pits grasses dominate with thrift Armeria maritima where the marsh is grazed by cattle and sheep. Extensive areas of eel grass Zostera marina and Z. nolti have been known to occur at Spurn Bight, although in recent years records are limited. Behind the sandflats of the Cleethorpes coast the mature sand-dune vegetation contains some locally and nationally rare species including chestnut flat sedge Blysmus rufus, bulbous meadow grass Poa bulbosa and dense silky-bent Apera interrupta. The sand dunes, which cap the shingle spit that forms Spurn Peninsula are dominated by marram grass Ammophila arenaria and patches of dense sea buckthorn Hippophae rhamnoides.

Ecosystem services

Aesthetic

Education

Food

Recreation

Storm/wave protection

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.*

None reported

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 Information

Species Information
Birds
Species currently occurring at levels of national importance:

Great bittern, *Botaurus stellaris*
stellaris subspecies – W Europe, NW Africa (breeding) population
2 booming males, breeding, representing an average of 10.5% of the GB population
(3 year mean 2000-2002)

Eurasian marsh harrier, *Circus aeruginosus*
Europe population
10 females, breeding, representing an average of 6.3% of the GB population
(5 year mean 1998-2002)

Pied avocet, *Recurvirostra avosetta*
Western Europe (breeding) population
64 pairs, breeding, representing an average of 8.6% of the GB population
(5 year mean 1998-2002)

Little tern, *Sterna albifrons*
albifrons subspecies, Western Europe (breeding) population
51 pairs, breeding, representing an average of 2.1% of the GB population
(5 year mean 1998-2002)

Dark-bellied brent goose, *Branta bernicla*
bernicla subspecies
2,098 individuals, wintering, representing an average of 2.1% of the GB population
(5 year peak mean 1996/7-2000/1)

Eurasian wigeon, *Anas penelope*
Northwestern Europe (non-breeding) population
5,044 individuals, wintering, representing an average of 1.2% of the GB population
(5 year peak mean 1996/7-2000/1)

Common teal, *Anas crecca*
crecca subspecies, Northwestern Europe (non-breeding population)
2,322 individuals, wintering, representing an average of 1.2% of the GB population

(5 year peak mean 1996/7-2000/1)

Common pochard, *Aythya ferina*
Northeastern & Northwestern Europe (non-breeding) population
719 individuals, wintering, representing an average of 1.2% of the GB population
(5 year peak mean 1996/7-2000/1)

Greater scaup, *Aythya marila*
marila subspecies, Western Europe (non-breeding) population
127 individuals, wintering, representing an average of 1.7% of the GB population
(5 year peak mean 1996/7-2000/1)

Common goldeneye, *Bucephala clangula*
clangula subspecies, Northwestern & Central Europe (non-breeding) population
467 individuals, wintering, representing an average of 1.9% of the GB population
(5 year peak mean 1996/7-2000/1)

Great bittern, *Botaurus stellaris*
stellaris subspecies – W Europe, NW Africa (breeding) population
4 individuals, wintering, representing an average of 4.0% of the GB population
(5 year peak mean 1998/9-2002/3)

Hen harrier, *Circus cyaneus*
Europe population
8 individuals, wintering, representing an average of 1.1% of the GB population
(5 year peak mean 1997/8-2001/2)

Eurasian oystercatcher, *Haematopus ostralegus*
ostralegus subspecies
3,503 individuals, wintering, representing an average of 1.1% of the GB population
(5 year peak mean 1996/7-2000/1)

Pied avocet, *Recurvirostra avosetta*
Western Europe (breeding) population
59 individuals, wintering, representing an average of 1.7% of the GB population
(5 year peak mean 1996/7-2000/1)

Great ringed plover, *Charadrius hiaticula*
hiaticula subspecies
403 individuals, wintering, representing an average of 1.2% of the GB population
(5 year peak mean 1996/7-2000/1)

Grey plover, *Pluvialis squatarola*
squatarola subspecies, Eastern Atlantic (non-breeding) population
1,704 individuals, wintering, representing an average of 3.2% of the GB population
(5 year peak mean 1996/7-2000/1)

Northern lapwing, *Vanellus vanellus*
Europe (breeding) population
22,765 individuals, wintering, representing an average of 1.1% of the GB population
(5 year peak mean 1996/7-2000/1)

Sanderling, *Calidris alba*
Eastern Atlantic (non-breeding) population

486 individuals, wintering, representing an average of 2.3% of the GB population
(5 year peak mean 1996/7-2000/1)

Curlew, *Numenius arquata*
arquata subspecies
3,253 individuals, wintering, representing an average of 2.2% of the GB population
(5 year peak mean 1996/7-2000/1)

Ruddy turnstone, *Arenaria interpres*
interpres subspecies, Northeastern Canada & Greenland (breeding) population
629 individuals, wintering, representing an average of 1.3% of the GB population
(5 year peak mean 1996/7-2000/1)

Great ringed plover, *Charadrius hiaticula*
psammodroma subspecies
1,766 individuals, passage, representing an average of 5.9% of the GB population
(5 year peak mean 1996-2000)

Grey plover, *Pluvialis squatarola*
squatarola subspecies, Eastern Atlantic (non-breeding) population
1,590 individuals, passage, representing an average of 2.3% of the GB population
(5 year peak mean 1996-2000)

Sanderling, *Calidris alba*
Eastern Atlantic (non-breeding) population
818 individuals, passage, representing an average of 2.7% of the GB population
(5 year peak mean 1996-2000)

Ruff, *Philomachus pugnax*
Western Africa (non-breeding) population
128 individuals, passage, representing an average of 1.4% of the GB population
(5 year peak mean 1996-2000)

Whimbrel, *Numenius phaeopus*
islandicus subspecies
113 individuals, passage, representing an average of 2.3% of the GB population
(5 year peak mean 1996-2000)

Common greenshank, *Tringa nebularia*
Northwestern Europe (breeding) population
77 individuals, passage, representing an average of 5.5% of the GB population
(5 year peak mean 1996-2000)

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
Aquatic vegetation (e.g. reeds, willows, seaweed)
Archaeological/historical site
Environmental education/ interpretation
Fisheries production
Livestock grazing
Non-consumptive recreation

Sport fishing
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:

24. Land tenure/ownership:

Ownership category	On-site	Off-site
Non-governmental organisation (NGO)	+	+
Local authority, municipality etc.	+	+
National/Crown Estate	+	+
Private	+	+
Public/communal	+	+

25. Current land (including water) use:

Activity	On-site	Off-site
Nature conservation	+	+
Tourism	+	+
Recreation	+	+
Current scientific research	+	
Cutting of vegetation (small-scale/subsistence)	+	
Fishing: commercial	+	+
Fishing: recreational/sport	+	+
Gathering of shellfish	+	+
Bait collection	+	+
Permanent arable agriculture		+
Permanent pastoral agriculture	+	+
Hunting: recreational/sport	+	+
Industrial water supply	+	+
Industry	+	+
Sewage treatment/disposal	+	+
Harbour/port	+	+

Flood control	+	+
Irrigation (incl. agricultural water supply)		+
Mineral exploration (excl. hydrocarbons)		+
Oil/gas exploration	+	+
Transport route	+	+
Domestic water supply		+
Urban development		+
Non-urbanised settlements		+
Military activities	+	+
Horticulture (incl. market gardening)		+

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?
Disturbance to vegetation through cutting / clearing	1	Reedbeds being cut and cleared on margins of pits associated with angling. Management agreements and enforcement to address.	+		
Vegetation succession	1	Lack of reedbed management leading to scrub encroachment. Management agreement to address.	+		
Water diversion for irrigation/domestic/industrial use	1	Abstraction causes reduced freshwater input. Review of consents well advanced but not yet implemented.	+	+	
Overfishing	2	Substantial lamprey by-catch in eel nets in River Ouse.		+	
Pollution – domestic sewage	1	Reduced dissolved oxygen in River Ouse is a barrier to fish migration. Review of consents well advanced but not yet implemented.	+	+	+
Pollution – agricultural fertilisers	1	Reduced dissolved oxygen in River Ouse is a barrier to fish migration. To be addressed through Catchment Sensitive Farming Initiatives and implementation of Water Framework Directive.	+	+	+
Recreational/tourism disturbance (unspecified)	1	Particularly illegal access by motorised recreational vehicles and craft. Control through management scheme.	+		

Other factor	1	Coastal squeeze causing loss of intertidal habitats and saltmarsh due to sea level rise and fixed defences. The Humber Flood Risk Management Strategy has been developed and is being implemented.	+		+

For category 2 factors only.
What measures have been taken / are planned / regulatory processes invoked, to mitigate the effect of these factors?
Overfishing - Overfishing – to be considered through an 'in-combination' assessment of possible factors as part of the Review of Consents exercise.

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)	+	+
National Nature Reserve (NNR)	+	
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)		+
Special Area of Conservation (SAC)	+	
IUCN (1994) category IV	+	

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.
Seal populations are monitored by the Sea Mammal Research Unit
Humber Wader Ringing Group
Spurn Bird Observatory
National Nature Reserve monitoring

Environment.
Institute of Estuarine & Coastal Studies, Hull: various
Industrial Concerns: monitoring on behalf of companies such as Associated British Ports and BP
Environment Agency monitoring: various
Geomorphological studies associated with shoreline management planning
National Nature Reserve monitoring

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.

There are a four National Nature Reserves with associated facilities within the Ramsar site (Spurn, Far Ings, Donna Nook and Saltfleetby – Theddlethorpe Dunes) and a number of other visitor, information and/or education centres including the Spurn Bird Observatory, the Cleethorpes Discovery Centre, Water's Edge and Far Ings. A wide range of Humber wide and area-specific information is available through a range of media (eg leaflets, displays, internet etc) including 'Humber Estuary European Marine Site Codes of Conduct' developed with a range of stakeholders to cover a range of recreational and educational activities and 'Coastal Futures' – a partnership project working with local communities affected by flood risk and associated issues including managed realignment includes proactive education work within schools.

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.
Sailing: marinas at Brough, Winteringham, Hull, Grimsby and South Ferriby.

Bathing etc: Cleethorpes (some 6m visitors/yr).

Walking/Horse riding: throughout

Beach fishing, match sea-fishing, non-commercial bait digging.

Non-commercial samphire collection

Wildfowling

Tourist amusements: Cleethorpes.

Bird watching: throughout but particularly at Blacktoft Sands RSPB reserve and the four National Nature Reserves.

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

Site-relevant references

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Please return to: **Ramsar Secretariat, Rue Mauverney 28, CH-1196 Gland, Switzerland**
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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: 08 June 1993

3. Country:

UK (England)

4. Name of the Ramsar site:

Lower Derwent Valley

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):

53 53 04 N 00 55 34 W

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: York

The site lies approximately 10 km east of York, much of it on the boundary between North Yorkshire and East Yorkshire.

Administrative region: East Riding of Yorkshire; North Yorkshire; York

10. Elevation (average and/or max. & min.) (metres): 11. Area (hectares): 915.45

Min. 4
Max. 7
Mean 5

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 Lower Derwent Valley represents one of the most important examples of traditionally managed species-rich alluvial flood meadow habitat remaining in the UK. These grasslands, which were formerly widespread, are now very restricted in distribution due to agricultural improvement. The river and these floodlands play a substantial role in the hydrological and ecological functioning of the internationally important Humber basin.

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).

1, 2, 4, 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 1

The site represents one of the most important examples of traditionally managed species-rich alluvial flood meadow habitat remaining in the UK.

The river and flood meadows play a substantial role in the hydrological and ecological functioning of the Humber Basin.

Ramsar criterion 2

The site has a rich assemblage of wetland invertebrates including 16 species of dragonfly and damselfly, 15 British Red Data Book wetland invertebrates as well as a leafhopper, *Cicadula ornata* for which Lower Derwent Valley is the only known site in Great Britain.

Ramsar criterion 4

The site qualifies as a staging post for passage birds in spring. Of particular note are the nationally important numbers of Ruff, *Philomachus pugnax* and Whimbrel, *Numenius phaeopus*.

Ramsar criterion 5

Assemblages of international importance:

Species with peak counts in winter:
31942 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 winter:

Eurasian wigeon , *Anas penelope*, NW Europe	8350 individuals, representing an average of 2% of the GB population (5 year peak mean 1998/9-2002/3)
Eurasian teal , *Anas crecca*, NW Europe	4200 individuals, representing an average of 1% of the population (5 year peak mean 1998/9-2002/3)

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.
See Sections 21/22 for details of noteworthy species
Details of bird species occuring at levels of National importance are given in Section 22

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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

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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	neutral, sand, clay, alluvium, peat, nutrient-poor, sedimentary

Geomorphology and landscape	lowland, valley, floodplain
Nutrient status	mesotrophic
pH	circumneutral
Salinity	fresh
Soil	mainly mineral
Water permanence	usually seasonal / intermittent
Summary of main climatic features	Annual averages (High Mowthorpe, 1971–2000) (www.metoffice.com/climate/uk/averages/19712000/sites/high_mowthorpe_.html) Max. daily temperature: 11.6° C Min. daily temperature: 5.1° C Days of air frost: 52.5 Rainfall: 729.4 mm Hrs. sunshine: 1397.9

General description of the Physical Features:

The Lower Derwent Valley is a major floodplain system holding a series of neutral alluvial flood meadows, fens, swamps, valley mires, alder *Alnus glutinosa* woodlands and other freshwater habitats lying adjacent to the River Derwent, Pocklington Canal and The Beck.

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 Yorkshire River Derwent catchment area covers approximately 2000 km² and includes the River Derwent, River Rye, Sea Cut, River Hertford, Costa Beck, Bielby Beck, Pocklington Canal and other tributaries. The rivers rise in the Vales of Pickering and York, Yorkshire Wolds and North York Moors before joining the River Derwent which joins the River Ouse at a tidal barrage at Barmby.

The River Derwent, its tributaries and associated wetlands are highly valued for nature conservation, ecology and landscape. The river is used extensively for public water supply and for recreation.

18. Hydrological values:

Describe the functions and values of the wetland in groundwater recharge, flood control, sediment trapping, shoreline stabilization, etc.

Flood water storage / desynchronisation of flood peaks, Maintenance of water quality (removal of nutrients), Water supply

19. Wetland types:

Inland wetland

Code	Name	% Area
4	Seasonally flooded agricultural land	81.9
Ts	Freshwater marshes / pools: seasonal / intermittent	8.7
M	Rivers / streams / creeks: permanent	6.6
Tp	Freshwater marshes / pools: permanent	2.2
W	Shrub-dominated wetlands	0.4
Xf	Freshwater, tree-dominated wetlands	0.2

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.

The Lower Derwent Valley contains extensive species-rich flood meadows, fens, swamps and wet woodland. The main vegetation types over 20 ha in extent are MG4; MG7c; MG8; MG9; MG13; S5; S19; S28; *Carex acuta* in swamps and fens; OV32.

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.

Lathyrus palustris, Sium latifolium, Oenanthe silaifolia, Persicaria laxiflora, Potamogeton trichoides

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:

Black-necked grebe , *Podiceps nigricollis nigricollis*, Europe, N Africa	11 pairs, representing an average of 35.4% of the GB population (5 year mean 1994-1998)
Great bittern , *Botaurus stellaris stellaris*, W Europe, NW Africa	1 individuals, representing an average of 4.7% of the GB population (5 year mean 1994-1998)
Garganey , *Anas querquedula*, W Africa/Europe	15 pairs, representing an average of 65.2% of the GB population (5 year mean 1994-1998)
Common quail , *Coturnix coturnix*, Europe	41 pairs, representing an average of 7.9% of the GB population (5 year mean 1994-1998)
Spotted crake , *Porzana porzana*, Europe	9 individuals, representing an average of 12.3% of the GB population (5 year mean 1994-1998)
Black-headed gull , *Larus ridibundus*, N & C Europe	2240 pairs, representing an average of 1.7% of the GB population (5 year mean 1994-1998)

Species with peak counts in winter:

Whooper swan , *Cygnus cygnus*, Iceland/UK/Ireland	63 individuals, representing an average of 1.1% of the GB population (5 year peak mean 1998/9-2002/3)
Gadwall , *Anas strepera strepera*, NW Europe	286 individuals, representing an average of 1.6% of the GB population (5 year peak mean 1998/9-2002/3)
Mallard , *Anas platyrhynchos platyrhynchos*, NW Europe	3850 individuals, representing an average of 1% of the GB population (5 year peak mean 1998/9-2002/3)
Northern pintail , *Anas acuta*, NW Europe	295 individuals, representing an average of 1% of the GB population (5 year peak mean 1998/9-2002/3)

Northern shoveler , *Anas clypeata*, NW & C Europe	232 individuals, representing an average of 1.5% of the GB population (5 year peak mean 1998/9-2002/3)
Water rail , *Rallus aquaticus*, Europe	8 individuals, representing an average of 1.7% of the GB population (5 year peak mean 1998/9-2002/3)
European golden plover , *Pluvialis apricaria apricaria*, P. a. altifrons Iceland & Faroes/E Atlantic	4800 individuals, representing an average of 1.9% of the GB population (5 year peak mean 1998/9-2002/3)
Ruff , *Philomachus pugnax*, Europe/W Africa	115 individuals, representing an average of 16.4% of the GB population (5 year peak mean 1998/9-2002/3)

Species Information

Nationally important species occurring on the site.

Invertebrates.

Panagaeus cruxmajor, Dytiscus dimidiatus, Saprinus virescens, Hydraena palustris, Atheta terminalis, Parphotistus nigricornis, Hypera diversipunctata, Rhamphomyia phyoprocta, Hilara brevittata, H. merula, Dolichopus cilifemoratus, Herrostomus angustifrons, Antichaeta analis, A. obliviosa, Dichetophora finlandica

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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
Environmental education/ interpretation
Livestock grazing
Non-consumptive recreation
Scientific research
Traditional cultural

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	+	+
Recreation	+	+
Current scientific research	+	
Commercial forestry		+
Fishing: recreational/sport	+	+
Arable agriculture (unspecified)		+
Permanent arable agriculture		+
Grazing (unspecified)	+	+
Hay meadows	+	+
Hunting: recreational/sport	+	+
Sewage treatment/disposal	+	+
Flood control	+	
Irrigation (incl. agricultural water supply)	+	+
Transport route		+
Domestic water supply	+	+
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?
Water diversion for irrigation/domestic/industrial use	1		+		
Reservoir/barrage/dam impact: flooding	1		+		

For category 2 factors only. What measures have been taken / are planned / regulatory processes invoked, to mitigate the effect of these factors?
Is the site subject to adverse ecological change? NO

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)	+	
National Nature Reserve (NNR)	+	
Special Protection Area (SPA)	+	
Land owned by a non-governmental organisation for nature conservation	+	
Management agreement	+	+
Site management statement/plan implemented	+	
Special Area of Conservation (SAC)	+	

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.
Migratory whimbrel.
All important breeding birds.
Otter populations.

Environment.
Biological and chemical water quality (routine).

Miscellaneous.
Research has been undertaken under the Lower Derwent Project into the hydrological and ecological functioning of the river, ings and associated features of wildlife interest.
Eutrophication and its effects on invertebrate communities.
Habitat requirements of farmland birds.

Flora.
NVC survey has been undertaken for much of the site.

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.

Guided walks and lectures are available on request. There are interpretation panels on the site and a site leaflet is available. The site is well used as an educational facility for schools, work-experience placements and for undergraduate/postgraduate demonstrations, placements and projects. It is also used by NGOs for staff development.

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.

There is no significant regular use of the site for recreation or tourism.

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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Appendix D Conservation Objectives for European Sites Taken to Stage 2: Appropriate Assessment

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Appendix D
Conservation Objectives for European Sites Taken to Stage 2: Appropriate Assessment

European Site Conservation Objectives for Humber Estuary Special Protection Area Site Code: UK9006111

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:

A021 *Botaurus stellaris*; Great bittern (Non-breeding)
A021 *Botaurus stellaris*; Great bittern (Breeding)
A048 *Tadorna tadorna*; Common shelduck (Non-breeding)
A081 *Circus aeruginosus*; Eurasian marsh harrier (Breeding)
A082 *Circus cyaneus*; Hen harrier (Non-breeding)
A132 *Recurvirostra avosetta*; Pied avocet (Non-breeding)
A132 *Recurvirostra avosetta*; Pied avocet (Breeding)
A140 *Pluvialis apricaria*; European golden plover (Non-breeding)
A143 *Calidris canutus*; Red knot (Non-breeding)
A149 *Calidris alpina alpina*; Dunlin (Non-breeding)
A151 *Philomachus pugnax*; Ruff (Non-breeding)
A156 *Limosa limosa islandica*; Black-tailed godwit (Non-breeding)
A157 *Limosa lapponica*; Bar-tailed godwit (Non-breeding)
A162 *Tringa totanus*; Common redshank (Non-breeding)
A195 *Sterna albifrons*; Little tern (Breeding)
Waterbird assemblage

This is a European Marine Site

This SPA is a part of the Humber Estuary 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 4). This document updates and replaces an earlier version dated 30 June 2014 to reflect the consolidation of the Habitats Regulations in 2017.

European Site Conservation Objectives for Humber Estuary Special Area of Conservation Site Code: UK0030170

With regard to 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 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:

H1110. Sandbanks which are slightly covered by sea water all the time; Subtidal sandbanks

H1130. Estuaries

H1140. Mudflats and sandflats not covered by seawater at low tide; Intertidal mudflats and sandflats

H1150. Coastal lagoons*

H1310. *Salicornia* and other annuals colonising mud and sand; Glasswort and other annuals colonising mud and sand

H1330. Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*)

H2110. Embryonic shifting dunes

H2120. Shifting dunes along the shoreline with *Ammophila arenaria* ("white dunes"); Shifting dunes with marram

H2130. Fixed dunes with herbaceous vegetation ("grey dunes"); Dune grassland*

H2160. Dunes with *Hippophae rhamnoides*; Dunes with sea-buckthorn

S1095. *Petromyzon marinus*; Sea lamprey

S1099. *Lampetra fluviatilis*; River lamprey

S1364. *Halichoerus grypus*; Grey seal

* denotes a priority natural habitat or species (supporting explanatory text on following page)

This is a European Marine Site

This site is a part of the Humber Estuary European Marine Site. 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.

*** 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 31 March 2014 to reflect the consolidation of the Habitats Regulations in 2017.

European Site Conservation Objectives for Lower Derwent Valley Special Protection Area Site Code: UK9006092

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:

A037 *Cygnus columbianus bewickii*; Bewick's swan (Non-breeding)
A050 *Anas penelope*; Eurasian wigeon (Non-breeding)
A052 *Anas crecca*; Eurasian teal (Non-breeding)
A056 *Anas clypeata*; Northern shoveler (Breeding)
A140 *Pluvialis apricaria*; European golden plover (Non-breeding)
A151 *Philomachus pugnax*; Ruff (Non-breeding)
Waterbird assemblage

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.

Appendix E
LSE and AEoI Summaries

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Appendix E
LSE and AEoI Summaries

E.1.1 The tables in this Appendix summarise the screening exercise and assessment of effects on integrity.

E.1.2 Note that the conclusions recorded in the table below apply to impacts from the Project alone or in combination.

Key to tables:

C = Construction

O = Operation/Maintenance

✓ = LSE or AEoI cannot be excluded

X = LSE or AEoI can be excluded

Table E.1 – Humber Estuary SAC (UK0030170) qualifying features relevant to the screening assessment and potential for LSE

Qualifying feature	Potential impact (C, O unless otherwise stated)	LSE?	AEoI?
H1110 Sandbanks which are slightly covered by sea water all the time H1130 Estuaries H1140 Mudflats and sandflats not covered by seawater at low tide H1150 Coastal lagoons H1310 *Salicornia* and other annuals colonising mud and sand H1330 *Glauco-Puccinellietalia maritimae*; Atlantic salt meadows	Loss of FLL (✓C, ✓O) Airborne pollution (✓C, **X** O) Hydrological changes (**X** C, **X** O) Disturbance of qualifying features (✓C, **X** O) Spread of INNS (**X** C, **X** O) Barriers to movement (**X** C, ✓O) Injury or mortality (**X** C, ✓ O)	**X** No LSEs were identified for Spread of INNS, Water Quality and Hydrological changes for either construction or operation/maintenance. ✓ Features H1110, H1130 and H1140 are present within the Order Limits at the River Ouse crossing points. Direct impacts are not anticipated as the Ouse crossing will be strung at height. However, indirect impacts as a result of airborne pollution are possible therefore there is the potential for LSEs. **X** Two qualifying coastal lagoon (H1150) areas are present within the Humber Estuary SAC boundary, both of which are located at least 20 km downstream from the draft Order Limits. These sites are outside the ZoI for any indirect impacts as a result of the Project. There is no potential for LSEs. ✓ Features H1310 and H1330 are present within the Order Limits at the River Ouse crossing points. Direct impacts are not anticipated as the Ouse crossing will be strung at height. However, indirect impacts as a result of airborne pollution are possible therefore there is the potential for LSEs. **X** Features H2110, H2120, H2130 and H2160 are not present in any coastal areas within the Order Limits. Direct impacts are therefore not anticipated. The closest sand dune systems are	**X** This HRA Report concludes that with the adoption of relevant mitigation, the effects associated with dust deposition will not adversely affect the Humber Estuary SPA Conservation Objectives for any qualifying features, H1110, H1130, H1140 H1310 and H1330.

Qualifying feature	Potential impact (C, O unless otherwise stated)	LSE?	AEoI?
H2110 Embryonic shifting dunes H2120 Shifting dunes along the shoreline with *Ammophila arenaria* ("white dunes") H2130 Fixed coastal dunes with herbaceous vegetation ("grey dunes") H2160 Dunes with *Hippophae rhamnoides* S1095 Sea lamprey (*Petromyzon marinus*) S1099 River lamprey (*Lampetra fluviatilis*)		south of Grimsby, over 50 km away. There is no potential for LSEs. **X** Both features S1095 sea lamprey and S1099 river lamprey are anadromous and are expected to use the entire continuum of watercourses within the Humber Estuary. Fish can be impacted by underwater sound/vibration, which can either be impulsive or continuous in nature, and can cause a variety of impacts to fish, ranging from severe physical injury (e.g., rupture of the swim bladder), physical damage to the auditory system (e.g., temporary shifts in hearing thresholds) to behavioural changes, such as disruption of migratory behaviours. All lamprey species lack swim bladders and are considered to be low-hearing-sensitivity fish. Generally, they are less susceptible to barotrauma because they detect particle motion rather than sound pressure. No in-channel works are proposed within the Humber Estuary SAC, although a safety boat will be used to aid in the stringing of the overhead line. The River Ouse is considered a busy waterway, and the lower Ouse remains a working river (Great Ouse Rivers Trust, 2022). The short-term use of the safety boat is inconsequential, given the scale of the works and existing volume of boat traffic. Likely significant effects as a result of this impact pathway can therefore be screened out.	

Qualifying feature	Potential impact (C, O unless otherwise stated)	LSE?	AEoI?
S1364 Grey seal (*Halichoerus grypus*)		**X** S1364 Grey seals spend most of their time out at sea feeding on fish and are less likely than common seals (*Phoca vitulina*) to enter rivers (DJF Russell, Sea Mammal Research Unit, 2016). Although they do spend most of their time out at sea, they return to land to rest and can often be seen 'hauled out' on beaches. One of the main haul-out sites for grey seals in the east of the UK is at Donna Nook, which is part of the Humber Estuary SAC (DJF Russell, Sea Mammal Research Unit, 2016) and lies approximately 58.8 km downstream of the Order Limits. As such, LSE are not applicable to grey seal.	

Table E.2 – Humber Estuary SPA (UK9006111) qualifying features relevant to the screening assessment and potential for LSE

Qualifying feature screened out due to low levels of abundance and distribution[15]	**Qualifying features taken through to AA**	**Potential impact (C, O unless otherwise stated)**	**LSE?**	**AEoI?**
oA169 Turnstone (*Arenaria interpres*) A059 Pochard (*Aythya farina*) A062 Scaup (*Aythya marila*) A675 Brent goose (*Branta bernicla bernicla*) A067 Goldeneye (*Bucephala clangula*) A144 Sanderling (*Calidris alba*) A672 Dunlin (*Calidris alpina alpina*) A143 Knot (*Calidris canutus*) A137 Ringed plover (*Charadrius hiaticula*) A082 Hen harrier (*Circus aeruginosus*)	A021 Bittern (*Botaurus stellaris*) A053 Mallard (*Anas platyrhynchos*) A081 Marsh harrier (*Circus aeruginosus*) A160 Curlew (*Numenius Arquata*) A140 Golden plover (*Pluvialis apricaria*) A142 Lapwing (*Vanellus vanellus*) WATR Waterbird assemblage (including considered component species: Wigeon (*Anas penelope*), Teal (*Anas crecca*), Shelduck (*Tadorna tadorna*)	Loss of FLL (✓C, ✓O) Airborne pollution (✓C, **X** O) Water Quality (**X** O**, X** C**)** Hydrological changes (**X** C, **X** O) Spread of INNS (**X** C, **X** O) Disturbance of qualifying features (✓C, **X** O) Barriers to movement (**X** C**,** ✓O) Injury or mortality (**X** C**,** ✓ O)	✓ Loss of FLL was identified as a LSE for both short-term construction and long-term operation direct habitat loss. ✓ Air pollution was identified as a potential LSE via dust deposition during construction. **X** No LSEs were identified for Spread of INNS, Water Quality and Hydrological changes for either construction or operation/maintenance. ✓ Disturbance of qualifying features was identified as a LSE for construction only.	**X** This HRA Report concludes that with the adoption of relevant alternative enhanced foraging habitat mitigation, the effects associated with Loss of FLL will not adversely affect any of the Humber Estuary SPA qualifying features as listed in the Conservation Objectives including the water bird assemblage considered component species. **X** This HRA Report concludes that with the adoption of relevant mitigation, the effects associated with dust deposition will not adversely affect the Humber Estuary SPA Conservation Objectives for any qualifying features. **X** The HRA Report concludes that with the adoption of

[15] These qualifying features and winter assemblage features are ruled out from LSE associated with all pathways due to their low levels of distribution and abundance as detailed within **Application Document 9.6.A2 Appendix 9.2 Ornithology Baseline Report**.

Qualifying feature screened out due to low levels of abundance and distribution[15]	Qualifying features taken through to AA	Potential impact (C, O unless otherwise stated)	LSE?	AEoI?
A130 Oystercatcher (*Haematopus ostralegus*) A157 Bar-tailed godwit (*Limosa lapponica*) A616 Black-tailed godwit (*Limosa limosa*) A158 Whimbrel (*Numenius phaeopus*) A151 Ruff (*Philomachus pugnax*) A141 Grey plover (*Pluvialis squatarola*) A132 Avocet (*Recurvirostra avosetta*) A195 Little tern (*Sterna albifrons*) A164 Greenshank (*Tringa nebularia*) A162 Redshank (*Tringa tetanus*) Waterbird assemblage considered component species:	Snipe (*Gallinago gallinago*) *Green sandpiper [16](Tringa ochropus)* *Greylag goose (Anser anser)[15]* *Pink-footed goose (Anser brachyrhynchus)[15]* *Little egret (Egretta garzetta)[15]*		✓ Barriers to movement was identified as a LSE for operation only. ✓ Injury or mortality to qualifying features was identified as a LSE for operation only.	relevant disturbance mitigation measures and alternative enhanced foraging habitat mitigation, the effects associated with noise and visual disturbance on the European site and any FLL will not adversely affect any of the Humber Estuary qualifying features as listed in the Conservation Objectives including the water bird assemblage considered component species. **X** On further examination of the field survey results and analysis of data relating to the overhead line already in place along part of the Humberhead Levels, the HRA Report concluded there were no significant effects associated with barriers to movements and therefore no potential for this pathway to adversely affect any of the

[16] Component species to be considered – species which are not listed on the SPA citation (Natural England, 2007) but occur at site levels of more than 1% of the national population, according to the most recent Humber Estuary Wetland Bird Survey (WeBS) 5-year average count.

Qualifying feature screened out due to low levels of abundance and distribution[15]	Qualifying features taken through to AA	Potential impact (C, O unless otherwise stated)	LSE?	AEoI?
Shoveler (Anas clypeata)[15] *Crane (Grus grus)*[15]				Humber Estuary qualifying features as listed in the Conservation Objectives including the water bird assemblage considered component species. **X** This HRA Report concludes that with the adoption of flight diverters in key sections of the Project, any effects associated with injury or mortality will not adversely affect any of the Humber Estuary SPA qualifying features as listed in the Conservation Objectives including the water bird assemblage considered component species.

Table E.3 – Humber Estuary Ramsar site (UK11031) qualifying features relevant to the screening assessment and potential for LSE

Qualifying feature	Potential impact (C, O unless otherwise stated)	LSE?	AEoI?
Criterion 1 – natural wetland habitats that are of international importance: Near natural estuary with component habitats, specifically dune systems and humid dune slacks, estuarine waters, intertidal mud and sand flats, saltmarshes, and coastal brackish/saline lagoons. Criterion 3 – supports populations of plants and/or animal species of international importance: Breeding colony of S1364 grey seals (*Halichoerus grypus*) at Donna Nook. Criterion 3 – supports populations of plants and/or animal species of international importance: Breeding colony of breeding S1202 natterjack toad (*Bufo calamita*) at Saltfleetby-Theddlethorpe.	Loss of FLL (✓C, ✓O) Airborne pollution (✓C, **X** O) Water Quality (**X** O, **X** C) Hydrological changes (**X** C, **X** O) Disturbance of qualifying features (✓C, **X** O) Spread of INNS (**X** C, **X** O) Barriers to movement (**X** C, ✓O) Injury or mortality (**X** C, ✓ O)	**X** No LSEs were identified for Spread of INNS, Water Quality and changes for either construction or operation/ maintenance. ✓ Criterion 1 - Several of these features are present within the Order Limits at the River Ouse crossing points (refer to Table E.1). Direct impacts are not anticipated as the Ouse crossing will be strung at height. However, indirect impacts as a result of airborne pollution via dust deposition are possible during construction. **X** Criterion 3 - Grey seals spend most of their time out at sea feeding on fish and are less likely than common seals (*Phoca vitulina*) to enter rivers (DJF Russell, Sea Mammal Research Unit, 2016). Although they do spend most of their time out at sea, they return to land to rest and can often be seen 'hauled out' on beaches. One of the main haul-out sites for grey seals in the east of the UK is at Donna Nook, which is part of the Humber Estuary SAC (DJF Russell, Sea Mammal Research Unit, 2016) and lies approximately 58.8 km downstream of the	**X** This HRA Report concludes that airborne pollution via dust deposition will not adversely affect the Humber Estuary Ramsar site features under Criterion 1 - natural wetland habitats that are of international importance: Near natural estuary with component habitats, specifically dune systems and humid dune slacks, estuarine waters, intertidal mud and sand flats, saltmarshes, and coastal brackish/saline lagoons, Criterion 5 – Bird Assemblages of International Importance: or Wintering waterfowl, and Criterion 6 – Bird Species/Populations. **X** This HRA Report concludes that with the adoption of relevant alternative enhanced foraging habitat mitigation, the effects associated with Loss of Functionally Linked Land will not adversely affect any of the Humber Estuary Ramsar site qualifying features as listed in Criterion 5 bird assemblages and Criterion 6 bird species/populations including the water bird assemblage considered component species.

Qualifying feature	Potential impact (C, O unless otherwise stated)	LSE?	AEoI?
Criterion 5 – Bird Assemblages of International Importance: Wintering waterfowl. Criterion 6 – Bird Species/Populations Occurring at Levels of International Importance: golden plover, red knot, dunlin, black-tailed godwit, redshank (passage), shelduck, golden plover, dunlin, bar-tailed godwit, redshank (overwintering) Criterion 8 – Internationally important source of food for fishes, spawning grounds, nursery and/or migration path: S1099 river lamprey (*Lampetra fluviatilis*) and S1095 sea lamprey (*Petromyzon marinus*).		Order Limits. As such, LSE are not applicable to grey seal. **X** For S1202 Natterjack Toad, Saltfleetby-Theddlethorpe (the nearest known breeding site) is located over 60 km from the Order Limits and well beyond the ZoI of the Project. ✓ Species that form part of Criterion 5 bird assemblages and Criterion 6 bird species/populations have been screened into the assessment. LSEs have been identified for Disturbance of qualifying features, Loss of Functionally Linked Land, Barriers to movement and Injury or mortality. **X** Both features of Criterion 8, sea and river and sea lamprey are anadromous and are expected to use the entire continuum of watercourses within the Humber Estuary. Fish can be impacted by underwater sound/vibration, which can either be impulsive or continuous in nature, and can cause a variety of impacts to fish, ranging from severe physical injury (e.g., rupture of the swim bladder), physical damage to the auditory system (e.g., temporary shifts in hearing	**X** This HRA Report concludes that with the adoption of flight diverters in key sections of the project Barriers to movement and Injury or mortality relevant will not adversely affect any of the Humber Estuary Ramsar site qualifying features as listed in Criterion 5 bird assemblages and Criterion 6 bird species/populations including the water bird assemblage considered component species.

Qualifying feature	Potential impact (C, O unless otherwise stated)	LSE?	AEoI?
		thresholds) to behavioural changes, such as disruption of migratory behaviours. All lamprey species lack swim bladders and are considered to be low-hearing-sensitivity fish. Generally, they are less susceptible to barotrauma because they detect particle motion rather than sound pressure. No in-channel works are proposed within the Humber Estuary Ramsar site although a safety boat will be used to aid in the stringing of the overhead line. The River Ouse is considered a busy waterway, and the lower Ouse remains a working river (Great Ouse Rivers Trust, 2022). The short-term use of the safety boat is inconsequential, given the scale of the works and existing volume of boat traffic. Likely significant effects as a result of this impact pathway can therefore be screened out.	

Table E.4 – Thorne and Hatfield Moors SPA (UK9005171) qualifying features relevant to the screening assessment and potential for LSE

Qualifying feature	Potential impact (C, O unless otherwise stated)	LSE?	AEoI?
A224 Nightjar (*Caprimulgus europaeus*)	Loss of FLL (C, O)	**X** Natural England initially raised the potential for foraging nightjar within the draft Order Limits and referred the Applicant to radio-tracking data from Mitchell *et al*. (Ref 10). However, this dataset indicates that nightjar foraging activity is highly localised and strongly associated with specific habitat types. The extensive arable monoculture surrounding the SPA, particularly to the north, provides poor-quality foraging habitat and was infrequently used by tracked individuals. In contrast, preferred foraging areas were linked to structurally diverse habitats, such as woodland edges and rough grassland mosaics (for example, an old colliery site at Thorne Moor). In all cases, birds rarely foraged more than 5 km from the SPA boundary. The Supplementary Advice on Conservation Objectives (SACO) for the Thorne and Hatfield Moors SPA (Natural England, 2019) indicates that the location of feeding areas supporting nightjar is often poorly understood. However, monitoring at other European sites suggests that nightjar focus on particularly rich feeding sites, often avoiding superficially similar habitats closer to their breeding sites. Tagging studies of nightjar in the SPA indicate that birds typically forage within 3 km of the SPA boundary, with only few individuals travelling further off-site (up to 5 km). At its closest, the SPA lies approximately 2.7 km from the Order Limits and	**X**

Qualifying feature	Potential impact (C, O unless otherwise stated)	LSE?	AEoI?
		foraging nightjars have not been detected during the nightjar surveys undertaken for the Project, as described in **Application Document 6.9.A2 Appendix 9.2 Ornithology Baseline Report**. The habitats within the Order Limits, extending up to 3 km from the SPA boundary, are dominated by large open arable fields with minimal hedgerow or scrub structure and no woodland. These habitats are considered unsuitable for supporting nightjar foraging activity. As nightjar has not been detected during surveys, and the Project is located close to the edge of the typical foraging range for this species and contains suboptimal foraging habitat, LSE can therefore be screened out for Thorne and Hatfield Moors SPA in relation to this impact pathway during construction.	
	Disturbance of qualifying features (C, O)		

Table E.5 – Thorne Moor SAC (UK0012915) qualifying features relevant to the screening assessment and potential for LSE

Qualifying feature	Relevance and justification (✓ requires consideration, X does not require consideration)
7120 Degraded raised bogs still capable of natural regeneration	**X** Thorne Moor SAC lies 2.70 km west of the Order Limits. No impact pathways have been identified between the Project and this European site either alone or in-combination with other Projects.

Table E.6 – Hatfield Moor SAC (UK0030166) qualifying features relevant to the screening assessment and potential for LSE

Qualifying feature	Relevance and justification (✓ requires consideration, X does not require consideration)
7120 Degraded raised bogs still capable of natural regeneration	**X** Hatfield Moor SAC lies 5.73 km west of the Order Limits. No impact pathways have been identified between the Project and this European site either alone or in combination with other Projects.

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