Immingham Green Energy Terminal

Environmental Impact Assessment

Preliminary Environmental Information Report

Volume II – Main Report

Chapter 10: Ornithology

Associated British Ports

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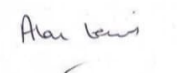
Signed		Date	20/12/2022
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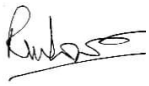
Signed		Date	20/12/2022
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10 Ornithology

10.1 Introduction

10.1.1 This chapter presents the preliminary findings of the assessment of the likely effects of the Project on Ornithology.

10.1.2 There may be interrelationships related to the potential effects on Ornithology and other disciplines. Therefore, also refer to the following chapters:

a. **Chapter 7: Noise and Vibration**;

b. **Chapter 8: Nature Conservation (Terrestrial Ecology)**;

c. **Chapter 9: Nature Conservation (Marine Ecology)**;

d. **Chapter 16: Physical Processes**; and

e. **Chapter 17: Marine Water and Sediment Quality**.

10.1.3 Relevant aspects of the ornithology assessment presented in this chapter will inform the Water Framework Directive (WFD) Assessment and the Habitats Regulations Assessment (HRA) which will be prepared and included in the Environmental Statement (ES).

10.1.4 This chapter is also supported by the following figures in Volume III of the PEI Report:

a. **Figure 10.1:** Monitoring locations of coastal waterbird surveys in the vicinity of the Project;

b. **Figure 10.2:** Internationally and nationally designated conservation sites;

c. **Figure 10.3:** The 5-year mean peak number of birds in Sector C during different winter months; and

d. **Figure 10.4:** The broad distribution of coastal waterbirds in Sector C.

10.2 Approach to Assessment

Scope and Methods

10.2.1 An Environmental Impact Assessment (EIA) scoping exercise was undertaken in August 2022 to establish the form and nature of the Ornithology assessment, and the approach and methods to be followed.

10.2.2 The Scoping Report (**Appendix 1.A** of the PEI Report, Volume IV) records thevi findings of the scoping exercise and details the technical guidance, standards, best practice and criteria being applied in the assessment to identify and evaluate the likely significant effects of the Project on ornithology.

10.2.3 Following receipt of the Scoping Opinion (**Appendix 1.B** of the PEI Report, Volume IV) as to the information to be provided in the Environmental Statement, the requirements set out in **Table 10.1**: Scoping opinion comments on ornithology have been agreed with the Planning Inspectorate as those to be taken into account as part of the ongoing ornithology assessment.

Table 10.1: Scoping opinion comments on ornithology

Consultee	Summary of Response	How comments have been addressed in this chapter
Planning Inspectorate	The Scoping Report proposes to scope out this matter [direct changes to waterbird bird foraging habitat as a result of the capital dredge and dredge disposal] as the dredge and disposal sites do not overlap the intertidal area and the seabed habitat is already highly dynamic and not known to support large populations of diving birds/ seabirds. The Inspectorate agrees this matter can be scoped out of the assessment given the low value of the habitat as a prey resource.	Scoping opinion noted.
	In the absence of agreement with Natural England, the Inspectorate does not agree that this matter [Indirect changes to intertidal feeding and roosting habitat as a result of the capital dredging] should be scoped out of the assessment because insufficient information has been provided to conclude that no significant effects would result from the scale of predicted changes on intertidal habitats. Evidence on this should be provided in the ES to demonstrate that there will be no likely adverse significant effects.	Noted. This pathway has been scoped into the assessment.
	The Scoping Report states that the resuspension of sediment onto the seabed as result of piling is expected to be negligible and benthic habitats and species are not expected to be sensitive to this level of change. The Inspectorate agrees that there is unlikely to be an effect on coastal waterbird habitat and prey resources and this matter [changes to seabed habitats and species as a result of sediment deposition during piling] can therefore be scoped out of the assessment.	Scoping opinion noted.

Consultee	Summary of Response	How comments have been addressed in this chapter
	The Scoping Report states that the presence of the piled structures has the potential to result in changes to hydrodynamic and sedimentary processes but this is anticipated to be negligible and highly localised and marine habitats and species are not expected to be sensitive to this level of change. The Inspectorate does not agree to scope out this matter [indirect changes to seabed habitats and species as a result of changes to hydrodynamic and sedimentary processes due to the presence of the piles] from the assessment until the physical processes assessment and other evidence provides sufficient evidence that there will be no significant adverse effects on marine habitats and species.	Noted. This pathway has been scoped into the assessment.
	The Scoping Report states that during capital dredging and dredge disposal, there is potential for the dredging vessel to cause noise and visual disturbance for bird populations but that the area is subject to high levels of vessel movements from the regular disposal of maintenance dredge arisings and shipping and that any potential disturbance stimuli caused by the capital dredge disposal would be highly temporary and localised. The Scoping Report adds that these areas are also not known to support large populations of diving birds/ seabirds. The Inspectorate does not agree this matter [noise and visual disturbance during capital dredge disposal] should be scoped from the assessment because there is insufficient evidence to conclude that the additional noise and visual disturbance would not have a significant adverse effect on bird species because of noise and visual disturbance during capital dredge disposal.	Additional evidence and literature has been used to inform the PEI Report assessment and the pathway has been scoped out based on this additional information (**Table 10.11**).
Natural England	Bird survey data is required which covers the full period when significant numbers of birds are likely to be using the site, in order to inform a thorough assessment of the potential impacts	Terrestrial waterbird survey scope covers the passage period, with surveys being undertaken twice monthly at

Consultee	Summary of Response	How comments have been addressed in this chapter
	of the development. As the surveys which relate to Immingham Outer Harbour cover the period October to March this will not cover the passage periods, in particular, we know that the Autumn passage period (August and September) is likely to be significant for SPA birds in this part of the estuary. In addition, bird data will be required which covers the low tide period as well as the high tide period, in order to have sufficient data to assess the construction and operational effects of the Project. It is not currently clear if this is the case for the data from Immingham Outer Harbour. Therefore additional bird surveys are likely to be required which cover the passage periods (particularly August and September) and potentially the low tide period.	High Water between September 2022 and March 2023 inclusive. The coastal waterbird surveys started in winter 1997/98 and have been ongoing annually since then with winter surveys undertaken between October and March twice a month. During each survey, either four counts (November to February) or five counts (other months) are undertaken every two hours after high water. The most recent 5-years of data (2017/18 to 2021/22) has been analysed. In addition, the 2021/22 survey season started in August rather than October. The surveys have been continued on a monthly basis in 2022 rather than stopping in March as per previous years. Surveys are therefore undertaken during both high and low water periods with data available for both winter and passage months.
	Changes to intertidal feeding and roosting habitat at whatever scale need to be (b)quantified, Natural England seek clarification on the justification for scoping this impact out of EIA. Additional noise will disturb local bird populations. Natural England have not seen the bird surveys mentioned in para 9.3.3 but these along with additional surveys programmed will indicate the level of disturbance on notified bird populations.	Noted. All potential pathways relating to intertidal habitat loss or change have been scoped into the assessment.
	Per section 9.4.7[Operation - pathways scoped out].- Natural England seeks clarification on this comment ['No pathways during the operational phase are proposed to be scoped out of the EIA'], does this mean that all impacts scoped in during the construction phase are also scoped in during the operational phase?	Only the pathways that are scoped in under operation will be considered. No other relevant pathways have been identified.

Consultee	Summary of Response	How comments have been addressed in this chapter
	Again Natural England welcome the commitment to consult all statutory bodies.	Noted.

10.2.4 Having regard to the information presented within the Scoping Report (**Appendix 1.A** of the PEI Report, Volume IV), the Planning Inspectorate's Scoping Opinion (**Appendix 1.B** of the PEI Report, Volume IV) has also confirmed the Applicant's view that significant effects on waterbird foraging habitat from dredging and disposal activities; and seabed habitats and species as a result of sediment deposition during piling are unlikely. Accordingly, these matters will remain scoped out of consideration in the Environmental Statement.

10.2.5 To facilitate the impact assessment process and ensure consistency in the terminology of significance, a standard assessment methodology will be applied to determine the significance of effects within the ES (see **Chapter 5: EIA Approach**). This methodology has been developed from a range of sources, including relevant Environmental Impact Assessment (EIA) Regulations, the EIA Directive (2014/52/EU), statutory and non-statutory guidance, consultations and professional project experience. The assessment also follows the principles of relevant guidance, including the latest guidelines from the Institute of Environmental Management and Assessment (IEMA) (Ref 10-2), and the Chartered Institute of Ecology and Environmental Management (CIEEM) guidelines for ecological impact assessment in the UK and Ireland (which combine advice for terrestrial, freshwater and coastal environments) (Ref 10-3). The methodology adopted is considered to be 'best practice'. The methodology is described in detail in **Chapter 5: EIA Approach** including definitions of sensitivity/importance of receptors and magnitude of change. In line with CIEEM guidelines ecological impacts are described in terms of their extent, magnitude, duration, frequency and timing, and the reversibility (recoverability).

Legislation, Policy and Guidance

10.2.6 **Table 10.2** presents the legislation, policy and guidance relevant to the Ornithology assessment and details how their requirements will be met.

Table 10.2: Relevant legislation, policy and guidance regarding Ornithology

Legislation / Policy / Guidance	Consideration within the PEI Report
Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora ('The Habitats Directive') (Ref 10-4)	
The Habitats Directive (92/43/EEC) is intended to help maintain biodiversity throughout the EU Member States by defining a common framework for the conservation of wild plants, animals and habitats of community interest. It established a network of Special Areas of Conservation (SAC) designated by Member States to conserve habitats and species (listed in Annexes I and II).	The Humber Estuary SAC and features are described in **Section 10.3**. A preliminary consideration of impacts on SAC habitats and potential indirect impacts on coastal waterbirds is provided in **Section 10.5**. A Habitats Regulations Screening report has been produced and is provided in **Appendix 9.C** (PEI Report Volume IV).
Council Directive 2009/147/EC on the conservation of wild birds ('The Birds Directive') (Ref 10-5)	
Directive 2009/147/EC on the conservation of wild birds is known as the 'Birds Directive'. It creates a	The Humber Estuary SPA and qualifying features are described in **Section 10.3**. A preliminary

Legislation / Policy / Guidance	Consideration within the PEI Report
comprehensive scheme of protection for all wild bird species. The Directive recognises that habitat loss and degradation are the most serious threats to the conservation of wild birds. It, therefore, places great emphasis on the protection of habitats for endangered as well as migratory species (listed in Annex I), especially through the establishment of a coherent network of Special Protection Areas (SPAs) comprising all the most suitable territories for these species.	consideration of impacts on coastal waterbirds which are features of these sites are outlined in **Section 10.5**. A Habitats Regulations Screening report has been produced and is provided in **Appendix 9.C** (PEI Report Volume IV)**.**
Directive 2000/60/EC of the European Parliament and of the Council of 23 October 2000 establishing a framework for Community action in the field of water policy. (Ref 10-6)	
The Water Framework Directive (2000/60/EEC) (WFD) establishes a framework for the management and protection of Europe's water resources. The overall objectives of the WFD is to achieve *"good ecological and good chemical status*" in all inland and coastal waters by 2021 unless alternative objectives are set or there are grounds for time limited derogation. For example, where pressures preclude the achievement of good status (e.g. navigation, coastal defence) in heavily modified water bodies (HMWBs), the WFD provides that an alternative objective of "good ecological potential" is set.	The Project (and associated disposal sites) is located within the Humber Lower water body (ID: GB530402609201) (further described in **Chapter 17: Marine Water and Sediment Quality)**. A WFD compliance assessment will be prepared to support the DCO application.
Conservation of Habitats and Species Regulations 2017 as amended ('The Habitats Regulations') (Ref 10-7)	
The Habitats Directive and Birds Directive are transposed into UK law through the Conservation of Habitats and Species Regulations 2017 as amended, known as the "Habitats Regulations"[1]. The Habitats Regulations provide for the designation and protection of 'European sites', the protection of 'European protected species' and the adaptation of planning and other controls for the protection of European Sites. The Regulations also require the compilation and maintenance of a register of European sites, to include SACs (classified under the Habitats Directive) and SPAs (classified under the Birds Directive). These sites	**Section 10.3** identifies protected coastal waterbird species. A preliminary consideration of impacts on these receptors are described in **Section 10.5**. A Habitats Regulations Screening report has been produced and is provided in **Appendix 9.C** (PEI Report Volume IV). This report will inform the consultation process and will aid the Competent Authority[2] in determining whether the Project has the potential for a likely significant effect (LSE) on the interest features and/or supporting habitat of a European/Ramsar site either alone or in-combination with other plans, projects and activities and, if so, will inform the requirement to undertake an Appropriate Assessment (AA) of the

1 Following the UK leaving the EU, the Conservation of Habitats and Species Regulations 2017 have been modified by the Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019. Available at: https://www.legislation.gov.uk/uksi/2019/579/contents/made (accessed October 2021) (Ref 10-8).

2 The Secretary of State is the Competent Authority for the HRA under the UK Habitats Regulations.

Legislation / Policy / Guidance	Consideration within the PEI Report
form the Natura 2000 network. These regulations also apply to Ramsar sites (designated under the 1971 Ramsar Convention for their internationally important wetlands), candidate SACs (cSAC), potential Special Protection Areas (pSPA), and proposed and existing European offshore marine sites.	implications of the proposals in light of the site's conservation objectives.
Water Environment (Water Framework Directive) (England and Wales) Regulations 2017 as amended (Ref 10-9)	
The Water Framework Directive (2000/60/EEC) is transposed into UK law through the Water Environment (Water Framework Directive) (England and Wales) Regulations 2017 as amended, known as the Water Framework Regulations[3].	The Project (and associated disposal sites) is located within the Humber Lower water body (ID: GB530402609201) (further described in **Chapter 17: Marine Water and Sediment Quality)**. A WFD compliance assessment will be prepared to support the DCO application.
Marine and Coastal Access Act 2009 (MCAA) (Ref 10-10)	
The MCAA provides the legal mechanism to help ensure clean, healthy, safe, productive, and biologically diverse oceans and seas by putting in place a new system for improved management and protection of the marine and coastal environment. The MCAA established the Marine Management Organisation (MMO) as the organisation responsible for marine planning and licensing. The Project will require a Marine Licence for the elements of the works below Mean High Water Springs including dredging, disposal and placing or removing objects on or from the seabed. For NSIPs the Development Consent Order (DCO) where granted may include provision deeming a marine licence to have been issued under Part 4 of the Marine and Coastal Access Act 2009. The MMO is responsible for enforcing, post-consent monitoring, varying, suspending, and revoking any deemed marine licence(s) as part of the DCO.	Information relevant to the marine licensing process is provided in the PEI Report including characterisation of the ornithology baseline (**Section 10.3**) and a preliminary assessment of impacts (**Section 10.5**). MCZs are considered in **Chapter 9: Nature Conservation (Marine Ecology)**.
The Planning Act 2008 (PA2008) (Ref 10-12)	
Whilst the MCAA regulates marine licensing for works at sea, section 149A of the Planning Act 2008 enables an applicant for a DCO to include within the Order a Marine Licence which is	Information relevant to the marine licensing process is provided in the PEI Report including characterisation of the ornithology baseline (**Section 10.3**) and a preliminary assessment of impacts (**Section 10.5**).

[3] Following the UK leaving the EU, the main provisions of the WFD have been retained in English law through The Floods and Water (Amendment etc.) (EU Exit) Regulations 2019 (Ref 10-11).

Legislation / Policy / Guidance	Consideration within the PEI Report
deemed to be granted under the provisions of the MCAA.	MCZs are considered in **Chapter 9: Nature Conservation (Marine Ecology)**.
The Wildlife and Countryside Act 1981 (WCA) (Ref 10-13)	
The WCA is the principal mechanism for the legislative protection of wildlife in Great Britain. The WCA is the means by which the Convention on the Conservation of European Wildlife and Natural Habitats (the Bern Convention), the Convention on the Conservation of Migratory Species of Wild Animals (Bonn Convention), the Birds Directive (79/409/EEC) and the Natural Habitats and Wild Fauna and Flora Directive (92/43/FFC) are implemented in Great Britain. The WCA applies to the terrestrial environment and inshore waters (0 to 12 nautical miles) and concerns the protection of wild animals and the designation of protected areas, including SSSIs.	**Section 10.3** identifies coastal waterbird species and supporting habitats which are protected under the WCA. A preliminary consideration of impacts on these receptors is provided in **Section 10.5**.
The Countryside and Rights of Way Act 2000 (CroW Act) (Ref 10-14)	
The CroW applies to England and Wales only. Part III of the CroW Act deals specifically with wildlife protection and nature conservation. The CroW Act places a duty on the Government to have regard for the conservation of biodiversity and maintain lists of species and habitats for which conservation steps should be taken or promoted, in accordance with the Convention on Biological Diversity. Schedule 9 of the CroW Act amends the SSSI provisions of the WCA, including increased powers for the protection and management of SSSIs. The provisions extend powers for entering into management agreements; place a duty on public bodies to further the conservation and enhancement of SSSIs; increase penalties on conviction where the provisions are breached; and include an offence whereby third parties can be convicted for damaging SSSIs.	A preliminary consideration of impacts on coastal waterbird species and assemblages, for which SSSIs have been designated, are presented in **Section 10.5**.
Natural Environment and Rural Communities Act 2006 (NERC Act) (Ref 10-15)	
The NERC Act came into force in October 2006. In addition to establishing Natural England (NE) as the body responsible for conserving, enhancing, and managing England's natural environment, the Act also made amendments to both the Wildlife and Countryside Act 1981 and the CroW Act 2000. For example, it extended the	A preliminary consideration of impacts to coastal waterbird species and supporting habitats which are protected under the NERC Act (priority species and habitats of principal importance) are presented in **Section 10.5**.

Legislation / Policy / Guidance	Consideration within the PEI Report
CroW Act's biodiversity duty to public bodies and statutory undertakers, and altered enforcement powers in connection with wildlife prosecution. In addition to this, the NERC Act contains a number of additional measures designed to help streamline delivery and simplify the legislative framework, such as changes to the remit and constitution of the Joint Nature Conservation Committee (JNCC), reconstitution of the Inland Waterways Amenity Advisory Council, and improving the governance arrangements for the National Parks. Section 41 of the NERC Act requires the SoS to publish a list of habitats and species which are of principal importance for the conservation of biodiversity in England. The list has been drawn up in consultation with NE, as required by the NERC Act.	
National Policy Statement for Ports (Ref 10-16)	
The National Policy Statement for Ports (NPSfP) provides the framework for decisions on proposals for new harbour facility developments that constitute an NSIP. This policy requires that in order to meet the requirements of the Government's policies on sustainable development, new port infrastructure should also, amongst other things, preserve, protect and where possible improve marine and terrestrial biodiversity, be adapted to the impacts of climate change and provide high standards of protection for the natural environment. As highlighted in paragraphs 5.1.4 and 5.1.5 of the NPSfP, where the development is subject to EIA, the applicant should ensure that the PEI Report clearly sets out any effects on internationally, nationally and locally designated sites of ecological or geological conservation importance, on protected species and on habitats and other species identified as being of principal importance for the conservation of biodiversity. As highlighted in paragraphs 5.1.8 and 5.1.9 of the NPSfP, developments should aim to avoid significant harm to biodiversity and geological conservation interests, including through mitigation and consideration of reasonable alternatives. They should also ensure that appropriate weight is attached to designated sites of international, national and local importance.	A preliminary consideration of impacts to coastal waterbird species and supporting habitats including those which are features of internationally, nationally and locally designated sites of ecological importance are presented in **Section 10.5**. Where appropriate, mitigation has been included and this is outlined in **Section 10.4**.

Legislation / Policy / Guidance	Consideration within the PEI Report
UK Marine Policy Statement (Ref 10-17)	
The UK Marine Policy Statement (MPS) is the framework for preparing marine plans and taking decisions affecting the marine environment. The MPS also sets out the general environmental, social and economic considerations that need to be taken into account in marine planning and provides guidance on the pressures and impacts that decision makers need to consider when planning for and permitting development in the UK marine areas. Paragraphs 3.1.7 and 3.1.8 of the MPS are relevant to the ecology assessment of the Project which, amongst other things, state that: *"Marine plan authorities and decision makers should take account of how developments will impact on the aim to halt biodiversity loss and the legal obligations relating to all MPAs, their conservation objectives, and their management arrangements…"* Marine plan authorities and decision-makers should take account of the regime for MPAs and comply with obligations imposed in respect of them. This includes the obligation to ensure that the exercise of certain functions contribute to, or at least do not hinder, the achievement of the objectives of an MCZ. This would also include the obligations in relevant legislation relating to SSSIs and sites designated under the Birds and Habitats Directives.	A preliminary consideration of impacts to coastal waterbird species and supporting habitats including those which are features of MPAs are presented in **Section 10.5**.
East Inshore and East Offshore Marine Plans (Ref 10-18)	
The East Inshore and East Offshore Marine Plans, which are collectively referred to as 'the East Marine Plans', were formally adopted on 2 April 2014. There are four policies within the East Marine Plans specifically related to nature conservation and ornithology.	Provides general guidance. See considerations of specific policies below.
Policy ECO1 - Cumulative impacts affecting the ecosystem of the East marine plans and adjacent areas (marine, terrestrial) should be addressed in decision-making and plan implementation:	Information on the cumulative and in-combination effects assessment for the Project are included in **Chapter 25: Cumulative and In-Combination Effects** of this PEI Report.
Policy BIO1 - Appropriate weight should be attached to biodiversity, reflecting the need to protect biodiversity as a whole, taking account of the best available evidence on those habitats and species that are protected or of conservation	A preliminary consideration of impacts to coastal waterbird species and supporting habitats are presented in **Section 10.5**.

Legislation / Policy / Guidance	Consideration within the PEI Report
concern in the East Marine Plans and adjacent areas (marine, terrestrial).	
Policy BIO2 **-** Where appropriate, proposals for development should incorporate features that enhance biodiversity and geological interests.	A preliminary consideration of design, mitigation and enhancement measures is outlined in **Section 10.4.**
Policy MPA1 - Any impacts on the overall MPA network must be taken into account in strategic level measures and assessments, with due regard given to any current agreed advice on an ecologically coherent network:	A preliminary consideration of impacts to coastal waterbird species and supporting habitats are presented in **Section 10.5**. A Habitats Regulations Screening report has been produced and is provided in **Appendix 9.C (**PEI Report, Volume IV). MCZs are considered in **Chapter 9: Nature Conservation (Marine Ecology)**.
North East Lincolnshire Local Plan 2013 to 2032 (Ref 10-19)	
The North East Lincolnshire Local Plan was adopted in 2018 and covers the period 2013 to 2032. Policy 7 of the plan highlights that for operational port areas *"proposals for port related use will be supported and, where appropriate, approved by the Council if the submitted scheme accords with the development plan as a whole and subject to the ability to satisfy the requirements of the Habitats Regulations."* In addition, Policy 41 of the plan states that: *"The Council will have regard to biodiversity and geodiversity when considering development proposals, seeking specifically to:* *A. establish and secure appropriate management of long-term mitigation areas within the Estuary Employment Zone, managed specifically to protect the integrity of the internationally important biodiversity sites (see Policy 9 'Habitat Mitigation - South Humber Bank');* *B. designate Local Wildlife Sites (LWSs) and Local Geological Sites (LGSs) in recognition of particular wildlife and geological value;* *C. protect manage and enhance international, national and local sites of biological and geological conservation importance, having regard to the hierarchy of designated sites, and the need for appropriate buffer zones;* *D. minimise the loss of biodiversity features, or where loss is unavoidable and justified ensure appropriate mitigation and compensation measures are provided;*	A preliminary consideration of impacts to coastal waterbird species and supporting habitats and designated sites are presented in **Section 10.5**. A Habitats Regulations Screening report has been produced and is provided in **Appendix 9.C** (PEI Report, Volume IV).

Legislation / Policy / Guidance	Consideration within the PEI Report
E. create opportunities to retain, protect, restore and enhance features of biodiversity value, including priority habitats and species; and, *F. take opportunities to retain, protect and restore the connectivity between components of the Borough's ecological network.* *Any development which would, either individually or cumulatively, result in significant harm to biodiversity which cannot be avoided, adequately mitigated or as a last resort compensated for, will be refused".*	

Stakeholder Engagement

10.2.7 A range of stakeholders have been engaged as part of the scoping process to obtain their views on the Project and the scope of the Ornithology assessment, the results of which are presented within the Scoping Opinion (**Appendix 1.B** of the PEI Report, Volume IV). This has included advice from Natural England which was provided alongside comments from the Planning Inspectorate as part of the scoping process. A meeting was held with Natural England on 23rd November 2022 to provide an overview of the Project and to discuss the impact pathways relevant to ornithology. Further engagement with statutory and non-statutory stakeholders will be carried out prior to submission of the DCO Application.

Limitations and Assumptions

10.2.8 The information presented in this preliminary assessment reflects that obtained and evaluated at the time of reporting, and is based on an emerging design for the Project and the maximum likely extents of land required for its construction and operation as outlined in **Chapter 2: The Project**.

10.2.9 The findings of this preliminary assessment may be subject to change as the design of the Project is developed and refined further through the assessment and consultation processes, and as further research and investigative surveys are completed to fully understand its potential effects.

10.2.10 This assessment has been undertaken based on the following assumptions:

a. The Project design and methodology, as detailed in **Chapter 2: The Project** and **Chapter 3: Need and Alternatives**;

b. The assessment of impacts relating to changes in hydrodynamic and sedimentary process is based on numerical modelling. Further modelling will be carried out to inform the ES; and

c. That during operation, periodic maintenance dredging will be required.

10.2.11 Whilst these are assumptions, the assessment within this PEI Report has been undertaken considering the anticipated worst-case scenario in respect of ornithology receptors at the dredge, piling and disposal locations.

10.2.12 Terrestrial breeding bird surveys have only been undertaken to date within the West Site area of the Site. Further breeding bird surveys will be undertaken in the spring/ summer 2023 survey season (five visits in the period March to May/ June) within the remaining areas of the Site that are suitable to support nesting birds; this is the triangle area of land off Queens Road and the band of mature deciduous woodland spanning Laporte Road (referred to as 'Long Strip'). Conclusions made in respect of breeding birds are therefore limited by the extent of survey work completed to date.

Study Area

10.2.13 The study area is the area over which potential direct and indirect effects of the Project may occur during construction and operation. The direct effects on ornithology receptors are those that occur within the footprint of the Project, such as the direct disturbance to supporting habitats and associated species as a result of the Project. Indirect effects are those that may arise outside this footprint, such as the potential noise and visual disturbance effects on waterbirds during construction.

10.2.14 The study area for coastal waterbirds is focused on the Port of Immingham area and proposed disposal sites with data for the wider Humber Estuary region presented where relevant to provide contextual information and to ensure the area of potential effects (e.g. noise disturbance) are fully considered. The study area for coastal waterbirds includes any terrestrial habitats adjacent to/ in close proximity to the Estuary that may support these species over the high tide period when intertidal habitats are reduced.

10.2.15 The study area for breeding birds (non-SPA/Ramsar species) includes terrestrial habitats within the red line boundary that have been identified as having the potential to support nesting species; this includes the scrub/ grassland within the West Site (surveyed in spring/summer 2022), and the scrub/ woodland within the Queens Road land, and the mature woodland within 'Long Strip' (to be surveyed in spring/summer 2023).

10.3 Baseline Conditions

Current Baseline

10.3.1 Current baseline conditions have been determined by a desk-based review of available information including:

a. Immingham Outer Harbour (IOH) Ornithology Surveys: Data from surveys carried out for a separate development (the IOH) have been used to inform the baseline for this Project as the IOH survey boundary overlaps with the Project area (**Figure 10.1** (PEI Report, Volume III)). The coastal waterbird surveys started in winter 1997/98 and have been ongoing annually since then with winter surveys undertaken between October and March twice a month[4].. During each survey, either four counts (November to February) or five counts

[4] Passage surveys have been undertaken on a weekly basis in March and April 2022 and will also be undertaken on a weekly basis from September to November 2022.

(other months) are undertaken every two hours after high water. The most recent 5-years of data (2017/18 to 2021/22) has been analysed. In addition, the 2021/22 survey season started in August rather than October. The surveys have been continued on a monthly basis in 2022 rather than stopping in March as per previous years. On this basis, the results from surveys covering passage and summer months (August and September 2021 and April to August 2022) have also been presented;

b. Wetland Bird Survey (WeBS) Core Counts Data: Core count data for data for 'Immingham Docks - Sector K' (ID 38905) which overlaps with the Project. These surveys are typically undertaken around high water. The most recent 5-years of data available from the British Trust for Ornithology (BTO) (2016/17 to 2020/21) has been analysed. In addition, estuary wide WeBS data for the Humber Estuary for 2015/16 to 2019/20 has also been reviewed to provide contextual information (Ref 10-20) [5];

c. Natural England Designated Sites Portal: Background information on the ecology of SPA qualifying bird species in the Humber Estuary (Ref 10-21);

d. Population Trends for Species in the Humber Estuary: Information on long-term trends in the population status of waterbirds in the Humber Estuary is available for the period up to 2016/2017 from the latest WeBS 'Alerts Report' (Ref 10-22). This is an information source describing waterbird numbers on protected areas and has an 'alert system' where species that have undergone major declines in numbers are identified; and

e. BTO Research Report Analysing WeBS data for the Humber Estuary: Population trends of waterbird species in different parts of the Humber Estuary for the period 2000/01 to 2016/17 (Ref 10-23).

Nature conservation sites and protected species

Designated sites

10.3.2 The Project falls within the boundaries of the Humber Estuary SAC, SPA and Ramsar site (collectively forming the Humber EMS; **Figure 10.2** (PEI Report, Volume III)). For the Humber Estuary SAC, the primary reason for designation is the presence of two broad scale habitats, 1130 Estuaries and 1140 Mudflats and sandflats not covered by seawater at low tide (Ref 10-24). These broad scale habitats support other more specific habitats which are qualifying features but not a primary reason for designation. These are:

a. 1110 Sandbanks which are slightly covered by sea water all the time;

b. 1150 Coastal lagoons (identified as a priority feature);

c. 1310 *Salicornia* and other annuals colonizing mud and sand;

d. 1330 Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*);

[5] It should be noted that as a result of COVID-19 lockdowns, the BTO were unable to undertake comprehensive counts and therefore produce robust data for 2020/21 at an estuary-wide scale and therefore the period 2015/16 to 2019/20 is the most recent 5 years of data available from the BTO.

e. 2110 Embryonic shifting dunes;

f. 2120 Shifting dunes along the shoreline with *Ammophila arenaria* ('white dunes');

g. 2130 Fixed coastal dunes with herbaceous vegetation ('grey dunes') (identified as a priority feature); and

h. 2160 Dunes with *Hippopha rhamnoides*.

10.3.3 Alongside the habitats for which the SAC is designated, there are also three mobile species listed on Annex II of the EU Habitats Directive (92/43/EEC) the Natural Habitats and Wild Fauna and Flora Directive) (Ref 10-4) included in the designation (Ref 10-24), namely:

a. 1095 Sea lamprey *Petromyzon marinus*;

b. 1099 River lamprey *Lampetra fluviatilis*; and

c. 1364 Grey seal *Halichoerus grypus*.

10.3.4 Qualifying features of the Humber Estuary SPA and Humber Estuary Ramsar site are shown in **Table 10.3** and **Table 10.4** respectively.

Table 10.3: Qualifying features of the Humber Estuary SPA

Internationally Important Populations	
Internationally Important Populations of Regularly Occurring Annex 1 Species	
Breeding Species Population	
Bittern *Botaurus stellaris*	2 calling males (10.5 % of the GB population)
Marsh Harrier *Circus aeruginosus*	10 breeding females (6.3 % of the GB population)
Avocet *Recurvirostra avosetta*	64 pairs (8.6 % of the GB population)
Little Tern *Sternula albifrons*	51 pairs (2.1 % of the GB population)
Wintering Species Population	
Bittern	4 (4.0 % of the GB population)
Hen harrier *Circus cyaneus*	8 (1.1 % of the GB population)
Bar-tailed Godwit *Limosa lapponica*	2,752 (4.4 % of the GB population)
Golden Plover *Pluvialis apricaria*	30,709 (12.3 % of the GB population)
Avocet *Recurvirostra avosetta*	54 (1.7 % of the GB population)

Internationally Important Populations	
On passage Species population	
Ruff *Calidris pugnax*	128 (1.4 % of the GB population)
Internationally Important Populations of Regularly Occurring Migratory Species	
Wintering Species Population	
Teal† *Anas crecca*	2,322 (<1 % of the population)
Wigeon† *Mareca penelope*	5,044 (<1 % of the population)
Mallard† *Anas platyrhynchos*	2,456 (<1 % of the population)
Turnstone† *Arenaria interpres*	629 (<1 % of the population)
Common Pochard† *Aythya ferina*	719 (<1 % of the population)
Greater Scaup† *Aythya marila*	127 (<1 % of the population)
Brent Goose† *Branta bernicla*	2,098 (<1 % of the population)
Goldeneye† *Bucephala clangula*	467 (<1 % of the population)
Sanderling† *Calidris alba*	486 (<1 % of the population)
Dunlin *Calidris alpina*	22,222 (1.7 % of the Northern Siberia/Europe/Western Africa population)
Red Knot *Calidris canutus*	28,165 (6.3 % of the North-eastern Canada/Greenland/Iceland/North-western Europe population)
Ringed Plover† *Charadrius hiaticula*	403 (<1 % of the population)
Oystercatcher† *Haematopus ostralegus*	3503 (<1 % of the population)
Black-tailed Godwit *Limosa*	1,113 (3.2 % of the Icelandic Breeding population)
Curlew† *Numenius arquata*	3,253 (<1 % of the population)
Grey Plover† *Pluvialis squatarola*	1,704 (<1 % of the population)
Shelduck *Tadorna tadorna*	4,464 (1.5 % of the North-western Europe population)
Redshank *Tringa totanus*	4,632 (3.6 % of the Eastern Atlantic Wintering population)
Northern Lapwing† *Vanellus vanellus*	22,765 (<1 % of population)

Internationally Important Populations	
On passage Species Population	
Sanderling†	818 (<1 % of the population)
Dunlin	20,269 (1.5 % of the Northern Siberia/Europe/Western Africa population)
Red Knot	18,500 (4.1 % of the North-eastern Canada/Greenland/Iceland/North-western Europe population)
Ringed Plover†	1,766 (<1 % of the population)
Black-tailed Godwit	915 (2.6 % of the Icelandic Breeding population)
Whimbrel† *Numenius phaeopus*	113 (<1 % of the population
Grey Plover†	1,590 (<1 % of the population)
Greenshank† *Tringa nebularia*	77 (<1 % of the population)
Redshank	7,462 (5.7 % of the Eastern Atlantic Wintering population)
Internationally Important Assemblage of Waterfowl	
Waterfowl assemblage	153,934 waterfowl
†Species with this symbol do not represent a population that is > 1 % of the international threshold but are included in the waterfowl assemblage.	

Source: Ref 10-25

Table 10.4: Qualifying marine features of the Humber Estuary Ramsar Site

Ramsar Criterion
Criterion 1 – natural wetland habitats that are of international importance
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.
Criterion 3 – supports populations of plants and/or animal species of international importance
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.

Ramsar Criterion	
Criterion 5 – Bird Assemblages of International Importance	
Wintering waterfowl	153,934 waterfowl (5-year peak mean 1998/99-2002/23)
Criterion 6 – Bird Species/Populations Occurring at Levels of International Importance	
Species	Spring/Autumn Population (5-year peak mean 1996-2000)
Golden Plover	17,996 (2.2 % of the Iceland & Faroes/East Atlantic population)
Red Knot	18,500 (4.1 % of the West & Southern African wintering population)
Dunlin	20,269 (1.5 % of the West Siberia/West Europe population)
Black-tailed Godwit	915 (2.6 % of the Iceland/West Europe population)
Redshank	7,462 (5.7 % of the population)
Species	Wintering Population (5-year peak mean 1996/97-2000/01)
Shelduck	4,464 (1.5 % of the North-western Europe Population)
Golden Plover	30,709 (3.8 % of the Iceland & Faroes/East Atlantic population)
Red Knot	28,165 (4.1 % of the West & Southern African wintering population)
Dunlin	22,222 (1.7 % of the West Siberia/West Europe population)
Black-tailed Godwit	1,113 (3.2 % of the Iceland/West Europe population)
Bar-tailed Godwit	2,752 (2.3 % of the West Paleartic population)
Criterion 8 – Internationally important source of food for fishes, spawning grounds, nursery and/or migration path	
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.	

Source: Ref 10-26

10.3.5 The Greater Wash SPA is designated for a range of seabird and diving bird species and is located approximately 20 km from the Project. Qualifying features of this site is shown in **Table 10.5**.

Table 10.5: Qualifying marine features of the Greater Wash SPA

Internationally Important Populations	
Internationally Important Populations of Regularly Occurring Annex 1 Species	
Breeding Species Population	
Little Tern *Sternula albifrons*	798 pairs (42 % of GB breeding population)
Common Tern *Sterna hirundo*	510 pairs (5.1% of GB breeding population)
Sandwich Tern *Sterna sandvicensis*	852 pairs (35% of GB breeding population)
Wintering Species Population	
Little Gull *Hydrocoloeus minutus*	1,255 (no current GB population estimate)
Red-throated Diver *Gavia stellata*	1,407 (8.3% of GB non-breeding population)
Internationally Important Populations of Regularly Occurring Migratory Species	
Common Scoter *Melanitta nigra*	3,449 (0.6% of biogeographic population)

Source: Ref 10-27

10.3.6 The Humber Estuary Site of Special Scientific Interest (SSSI) overlaps part of Study Area. This is designated for its nationally important habitat assemblage (intertidal mudflats and sandflats, and coastal saltmarsh) geological interest, importance to breeding, wintering and passage birds, breeding grey seal and the presence of river and sea lamprey.

10.3.7 North Killingholme Haven Pits SSSI is located approximately 6km away from the Study Area. This SSSI comprises saline lagoon habitats and supports important populations of waders including Black-tailed Godwits and Redshank. The Lagoons SSSI is located approximately 20 km from the Site and supports a variety of coastal habitats (such as saline lagoons and sand dunes) and well as a population of breeding Little Terns.

10.3.8 The nearest Local Nature Reserve (LNR) is Cleethorpes Sands LNR (located approximately 13 km south east of the Site) which supports a variety of intertidal and coastal habitats.

H5 Protected species

10.3.9 The *Wildlife and Countryside Act (1981) (as amended)* (WACA) (Ref 10-13) protects various animals, plants, habitats in the UK including bird species. In addition, all naturally occurring wild bird species, their eggs, nests and habitats are strictly protected under the Birds Directive.

10.3.10 Some marine fauna and habitats are listed as priority species and habitats of principle importance in England, as required under Section 41 of the *Natural Environment and Rural Communities (NERC) Act (2006) (England)* (Ref 10-15). Species of principle importance which are of relevance to the Humber Estuary

include various species of waterbird. Habitats of principle importance of relevance to the Humber Estuary include supporting habitat for waterbirds including intertidal mudflats and coastal saltmarsh.

Coastal waterbirds

Humber Estuary overview

10.3.11 The Humber Estuary is a site of national and international importance for its waders and wildfowl (ducks and geese) populations, regularly supporting over 130,000 waterbirds during winter and passage periods (Ref 10-20; Ref 10-23).

10.3.12 Waterbird numbers are highly variable in the Humber Estuary throughout the year, but it is considered to be an important site year-round due to the presence of different populations of wintering, passage and breeding birds which move into and out of the estuary. In general, numbers of coastal waterbirds are at their lowest during June, when the assemblage is dominated by wildfowl, before numbers start increasing during July due to the return of waders such as Dunlin. Golden Plover starts to become more abundant in late summer. The arrival of wintering waterfowl such as Pink-footed Geese and Wigeon as well as wader species such as Knot typically occurs in early autumn. Numbers start to fall in late winter with the departure of species such as Golden Plover and Knot, before increasing slightly in spring as passage flocks start to move through the area and wildfowl depart (Ref 10-21).

10.3.13 **Table 10.6** provides summary ecology information on key waterbird species occurring in the Humber Estuary in intertidal and marine habitats. This includes the 5-year estuary-wide mean peaks for these species for 2015/16 to 2019/20 (the most recent 5-years of data available from the BTO) (Ref 10-20)[6].

[6] It should be noted that as a result of COVID-19 lockdowns, the BTO were unable to undertake a full survey programme and therefore produce robust data for 2020/21 at an estuary-wide scale and therefore the period 2015/16 to 2019/20 is the most recent 5 years of data available from the BTO.

Table 10.6: Summary information for key species of coastal waterbird in the Humber Estuary

Species group	Species	Feeding behaviour in the marine environment [1]	Diet [2]	Distribution in the Humber Estuary [3]	Month of peak count [4]	WeBS Core Count 5-year estuary-wide mean peaks (2015/16 to 2019/20) [5]
Wader	Golden Plover	Roosts but rarely feeds in the intertidal	Mainly insects, especially beetles, as well as other invertebrates and some plant material.	Golden Plover mainly uses the estuary to roost in areas including Alkborough Flats, Whitton Sands, Blacktoft Sands, Read's Island in the Inner Humber Estuary and Salt End, Stone Creek, Paull Holme Stray, Cherry Cobb Sands and Pyewipe in the Middle Humber.	Oct-Dec	31,237
	Knot	Intertidal benthivore	Mainly molluscs, including the bivalve *Limecola balthica*, cockles *Cerastoderma edulis* and mud snail *Peringia ulvae*, the latter especially in early winter. Diet proportions of 75 % bivalves, 1 % worms and 24 % 'other'. Prey is eaten whole and crushed within the gizzard.	Knot is found in the outer Humber including Cherry Cobb Sands and the Lincolnshire coast south of Grimsby. Easington Lagoons provide an important roost site for Knot during high spring tides.	Jan, Mar, Nov-Dec	22,500

Species group	Species	Feeding behaviour in the marine environment [1]	Diet [2]	Distribution in the Humber Estuary [3]	Month of peak count [4]	WeBS Core Count 5-year estuary-wide mean peaks (2015/16 to 2019/20) [5]
	Lapwing	Roosts but rarely feeds in the intertidal	Wide range of invertebrates including beetles and earthworms.	Lapwing mainly uses the estuary to roost in areas including Alkborough Flats, Whitton Sands, Blacktoft Sands and Read's Island in the Inner Humber Estuary as well as Salt End, Stone Creek, Paull Holme Stray, Cherry Cobb Sands and Pyewipe (all Middle Humber Estuary). The majority of feeding occurring inland, though some feeding on intertidal areas takes place during July to September.	Jan-Feb, Dec	16,453
	Dunlin	Intertidal benthivore	Oligochaetes, polychaete worms (such as *Hediste diversicolor, Nephtys* spp., *Pygospio elegans* and *Scoloplos armiger*), bivalves (such as *Limecola balthica*) and the mud snail *Peringia ulvae*. Diet proportions of 70 % worms, 14 % bivalves and 16 % 'other'.	Widespread with important areas including Read's Island (Inner Humber Estuary), Cherry Cobb Sands, Pyewipe, Stone Creek and Salt End (all Middle Humber Estuary) and Saltfleet (Outer Humber Estuary).	Aug, Nov-Dec	15,954

Species group	Species	Feeding behaviour in the marine environment [1]	Diet [2]	Distribution in the Humber Estuary [3]	Month of peak count [4]	WeBS Core Count 5-year estuary-wide mean peaks (2015/16 to 2019/20) [5]
	Oyster-catcher		Predominantly bivalves especially large cockles *Cerastoderma edule*, mussels *Mytilus edulis* and tellins *Limecola* spp. Diet might also include polychaete worms on mudflats and earthworms from wet fields.	Found predominantly in the Outer Humber Estuary. The most important areas for Oystercatcher are along the Lincolnshire coast.	Feb, Sep-Dec	5,816
	Black-tailed Godwit		Invertebrates, including beetles, polychaete worms (such as *Hediste diversicolor, Nephtys, Pygospio elegans* and *Scoloplos armiger*), molluscs (such as *Limecola balthica)* crustaceans and some plant material.	Key areas include Pyewipe and North Killingholme Haven Pits for this species during winter.	Aug-Oct	4,545
	Grey Plover		Polychaete worms (such as *Hediste diversicolor* and *Arenicola marina*), bivalves (such as *Limecola*	Widespread usage across the Middle and Outer parts of the Humber Estuary. Typically, more usage of the north bank compared to the south bank. Particular key	Jan, Mar, May, Sep	3,179

Species group	Species	Feeding behaviour in the marine environment [1]	Diet [2]	Distribution in the Humber Estuary [3]	Month of peak count [4]	WeBS Core Count 5-year estuary-wide mean peaks (2015/16 to 2019/20) [5]
			balthica) and the muds snail *Peringia ulvae.*	areas include Cherry Cob Sands, and Welwick.		
	Redshank		Polychaete worms (such as *Hediste diversicolor, Nephtys spp., Pygospio elegans and Scoloplos armiger*), the bivalve *Limecola balthica,* crustaceans (such as brown shrimp *Crangon crangon and* mud shrimp *Corophium* spp.*) and* the mud snail *Peringia ulvae*. Will also consume terrestrial invertebrates, including insects and spiders. Diet proportions of 46 % worms, 7 % bivalves and 47 % 'other'.	Widespread with key areas including Cherry Cobb Sands and in the outer Humber Estuary.	Sep-Oct, Dec	2,881
	Curlew		Primarily bivalves (such as *Cerastoderma edule* and *Limecola balthica)*, the ragworm *Hediste diversicolo*r and lugworm *Arenicola marina).*	Important areas include Cherry Cobb sands and Patrington to Easington (Outer North), Read's Island (Inner Humber), Pyewipe, Salt End (both Middle Humber)	Jan, Jul, Sep	2,787

Species group	Species	Feeding behaviour in the marine environment [1]	Diet [2]	Distribution in the Humber Estuary [3]	Month of peak count [4]	WeBS Core Count 5-year estuary-wide mean peaks (2015/16 to 2019/20) [5]
			Earthworms on terrestrial habitats, Diet proportions during winter of 46 % bivalves, 35 % worms and 19 % 'other'.	and Theddlethorpe St. Helen (Outer South).		
	Avocet		Benthic crustaceans e.g. *Corophium* spp. and worms such as ragworm *H. diversicolo*r. Insects, especially Chironomidae larvae, in freshwater habitats.	Largest wintering flocks are present in the inner Humber around Far Ings/Read's Islands, close to the favoured locations for breeding.	Aug-Oct	2,479
	Bar-tailed Godwit		Polychaete worms are the principal food source during winter such as *Hediste diversicolor, Nephtys, Pygospio elegans and Scoloplos armiger*. Diet proportions comprise 94 % worms. Other species sometimes consumed include the shrimp *Crangon crangon* and bivalve *Limecola balthica.*	The most important sectors for Bar-tailed Godwit are the three sectors that make up the Outer (North) area, and the adjacent Cherry Cobb Sands (Middle Humber), and Paull Holme Strays (also Middle Humber).	Feb, Sep, Nov	1,561

Species group	Species	Feeding behaviour in the marine environment [1]	Diet [2]	Distribution in the Humber Estuary [3]	Month of peak count [4]	WeBS Core Count 5-year estuary-wide mean peaks (2015/16 to 2019/20) [5]
	Ringed Plover		In winter, mainly marine worms, crustaceans (such as *Corophium* spp.) and molluscs (such as *Peringia ulvae*).	Most commonly recorded in the Outer Estuary.	Aug-Sep	731
	Sanderling		Polychaete worms (such as *Hediste diversicolor*), crustaceans and insects. Diet proportions comprise 60 % worms, 1 % molluscs and 39 % 'other'.	Within the Humber Estuary, Sanderling are found exclusively in the outer estuary, particularly on the sandflats of the Lincolnshire coast.	May, Jul-Aug, Dec	579
	Turnstone		A wide range of invertebrates and other food sources. This includes polychaete worms and mudshrimp *Corophium* spp. on mudflats. Also feeds on rocky shore species, including mussels, amphipods, molluscs (such as periwinkles) and crabs. Diet proportions comprise 20 % bivalves,	Key areas for Turnstone include rocks around New Holland between Barton upon Humber and East Halton (Middle Humber) and between Grimsby and Cleethorpes (Outer South). Also feed on jetties and around the harbours.	Feb, Sep, Nov-Dec	239

Species group	Species	Feeding behaviour in the marine environment [1]	Diet [2]	Distribution in the Humber Estuary [3]	Month of peak count [4]	WeBS Core Count 5-year estuary-wide mean peaks (2015/16 to 2019/20) [5]
			5 % worms and 75 % 'other'.			
	Whimbrel		On passage the species consumes shrimps, molluscs, worm and crabs.	No obvious preferred areas, found throughout the Humber during migration periods.	Jul-Aug	110
	Ruff	Intertidal benthivore on mudflats but omnivores more generally	Omnivore feeding on insects, larvae, frogs, small fish and seeds.	The Humber Estuary is considered an important site for passage Ruff. The most important areas of the Humber for the ruff are the intertidal mud and sand flats and adjacent lagoons of Alkborough Flats and Blacktoft Sands with smaller numbers also observed wintering along the River Trent, at North Killingholme and at Tetney). During autumn, Paull Holme Strays, Sunk Island, Read's Island, New Holland and Whitgift Sand on the River Ouse are also important areas.	Aug-Oct	80
Water-fowl	Pink-footed Goose	Herbivorous waterfowl	Herbivorous. Outside the breeding season this species feeds on improved grasslands, cereal	Recorded mainly on Read's Island, which it uses as a roosting site, flying inland during the day to feed in fields.	Oct-Nov	14,345

Species group	Species	Feeding behaviour in the marine environment [1]	Diet [2]	Distribution in the Humber Estuary [3]	Month of peak count [4]	WeBS Core Count 5-year estuary-wide mean peaks (2015/16 to 2019/20) [5]
			stubbles and vegetables (e.g. potatoes, sugar beet, carrots).			
	Shelduck	Intertidal benthivore	Invertebrates, with small molluscs predominant in north and west Europe, especially mud snail *Peringia* spp. Other species consumed include the mud shrimp *Corophium volutator*, bivalves and polychaetes.	Shelduck are found throughout the estuary with key areas including Read's Island and Alkborough Flats (Inner Humber) and at Pyewipe, Salt End, Cherry Cobb Sands and Paull Holme Sands (Middle Humber).	Jul-Aug, Oct-Nov	4,515
	Teal	Omnivorous waterfowl	Seeds of saltmarsh and other wetland plants, including glasswort Salicornia spp. and oraches *Atriplex* spp., and invertebrates (especially small oligochaetes) sifted from the benthos.	Key areas include Alkborough Flats, Read's Island and Blacktoft Sands.	Sep-Nov	3,757
	Dark-bellied Brent Goose	Herbivorous waterfowl	Mainly grasses, and on arable land the shoots of winter cereals, and oilseed rape. On estuaries,	The North Lincolnshire coast between Tetney and Donna Nook is a key area. Spurn is also important during spring passage.	Jan, Nov-Dec	3,092

Species group	Species	Feeding behaviour in the marine environment [1]	Diet [2]	Distribution in the Humber Estuary [3]	Month of peak count [4]	WeBS Core Count 5-year estuary-wide mean peaks (2015/16 to 2019/20) [5]
			eelgrass *Zostera* spp. and saltmarsh plants.			
	Wigeon		Plants (leaves, stems, stolons, bulbils and rhizomes).	Alkborough Flats and Read's Island as well as Faxfleet to Brough Haven (also Inner Humber) are key areas.	Jan-Feb, Sep, Nov	2,672
	Greylag Goose		Grass, roots, cereal leaves and spilled grain.	Present within the Inner Humber to a greater extent (e.g. Faxfleet). Present in greatest numbers close to freshwater pools.	Aug-Sep, Nov	1,595
	Mallard	Omnivorous waterfowl	Omnivorous, including both plants and animal matter.	Occurs throughout Humber Estuary, with key areas including the River Ouse and Cherry Cobb Sands. The area around the outfall at New Holland is also a favoured area where the birds feed on grain spill from the dock.	Jan-Feb, Sep, Nov-Dec	1,046
	Barnacle Goose	Herbivorous waterfowl	The leaves and stems of grasses, roots and seeds.	Present on fields/arable land around the entire Humber Estuary in low densities.	Jan-Mar, Sep	878

Species group	Species	Feeding behaviour in the marine environment [1]	Diet [2]	Distribution in the Humber Estuary [3]	Month of peak count [4]	WeBS Core Count 5-year estuary-wide mean peaks (2015/16 to 2019/20) [5]
	Common Scoter	Benthivorous diving duck	Molluscs.	Present within the Outer Humber due to their more pelagic lifestyle. Occurs in passage and winter.	Mar, Oct-Dec	682
	Canada Goose	Herbivorous waterfowl	Roots, grass, leaves and seeds.	Occurs within the Inner Humber in the largest numbers. Present in greatest numbers close to freshwater pools.	Jun, Sep	641
	Goldeneye	Benthivorous diving duck	Mostly aquatic insects, molluscs and crustaceans. Occasional fish. Plant material generally less than 25 %.	Goxhill to New Holland and Barrow to Barton (including Barton Pits) are key areas.	Jan, Dec	329
Gull	Black-headed Gull	Omnivorous/ scavenging gull	Worms, insects, small fish, crustacea and carrion.	Widely distributed.	Aug-Sep	11,217
	Common Gull		Worms, insects, fish and carrion.	Widely distributed.	Aug-Oct, Dec	1,599
	Herring Gull		Carrion, offal, seeds, fruits, young birds, eggs, crustaceans, small mammals, insects and fish.	Widely distributed.	Jan, Apr, Sep, Dec	1,015

Species group	Species	Feeding behaviour in the marine environment [1]	Diet [2]	Distribution in the Humber Estuary [3]	Month of peak count [4]	WeBS Core Count 5-year estuary-wide mean peaks (2015/16 to 2019/20) [5]
	Great Black-backed Gull		Shellfish, birds and carrion.	Widely distributed.	Sep-Dec, Feb	292
Terns, and other diving birds	Sandwich Tern	Piscivorous plunge diver	Fish such as sandeels, sprats and whiting.	Widely distributed.	Jul-Aug	686
	Common Tern		Fish and crustaceans in some areas.	Widely distributed.	Aug-Sep	476
	Cormorant	Piscivorous pursuit diver	Feeds on fish such as flatfish, blennies gadoids, sandeel, salmonid and eels.	Widely distributed.	Jan-Feb, Sep, Nov	323
	Red-throated Diver	Piscivorous pursuit diver	Diet consists predominantly of fish (mainly clupeids, mackerels, flatfish, gadoids and sand eels).	Recorded mainly in the outer Humber Estuary and approaches.	Jan-March	39

1. Feeding behaviour based on Ref 10-28 and Ref 10-29:

Intertidal benthivore: Waterbird species feeding on infaunal and/or epibenthic invertebrates in intertidal habitats;

Herbivorous waterfowl: Geese, swans and ducks feeding on plant material;

Omnivorous waterfowl: Ducks feeding on a range of animal and plant food;

Species group	Species	Feeding behaviour in the marine environment [1]	Diet [2]	Distribution in the Humber Estuary [3]	Month of peak count [4]	WeBS Core Count 5-year estuary-wide mean peaks (2015/16 to 2019/20) [5]
Benthivorous diving duck: Diving ducks/seaducks feeding on epibenthic and infaunal invertebrates on the seabed; Omnivorous/scavenging gull: Gulls feeding on a range of animal and plant food including through scavenging; Piscivorous plunge diver: Seabirds foraging for fish through plunge diving; and Piscivorous pursuit diver: Seabirds foraging for fish through pursuit diving. 2. Based on Ref 10-30; Ref 10-31 and Ref 10-32. 3. Based on Ref 10-31 and Ref 10-33 4. Months when peaks count occurred in the 2015/16 to 2019/20 estuary-wide BTO Core Counts (Ref 10-20). 5.Data from Ref 10-20.						

10.3.14 The most abundant wading bird species recorded in the Humber Estuary are Golden Plover and Knot (5-year mean peak for 2015/16 to 2019/20 of 31,237 and 22,500 birds respectively). Other wading birds occurring in large numbers include Lapwing (5-year mean peak of 16,453 birds) and Dunlin (5-year mean peak of 15,954 birds) as well as Oystercatcher, Black-tailed Godwit, Grey Plover, Curlew, Avocet and Bar-tailed Godwit (Ref 10-20). Important areas for feeding and roosting waders include the Pyewipe frontage on the south bank and Paull Holme, Cherry Cobb, Foulholme, Spurn and Sunk Island Sands on the north bank of the Humber Estuary. In the inner section of the Humber Estuary, sites such as Blacktoft Sands, Alkborough and Read's Island Flats are considered important (Ref 10-21). The numbers of different waders in the Humber Estuary can show a high degree of interannual variation with some species (such as Black-tailed Godwit, Avocet, Oystercatcher) showing an overall long-term increase in estuary wide numbers with other species such as Dunlin, Redshank and Knot showing an overall decline (Ref 10-31; Ref 10-22).

10.3.15 Key prey items for waders on the Humber Estuary include annelid worms (such as ragworm *Hediste diversicolor, lugworm Arenicola marina, Pygospio elegans, Streblospio shrubsolii, Tubificoides spp., and Nephtys spp), the bivalves Cerastoderma edule and Limecola balthica, the mudsnail Peringia spp. and mud shrimp Corophium spp* (Ref 10-30; Ref 10-31).

10.3.16 The most abundant wildfowl bird species recorded in the Humber Estuary are Pink-footed Goose and Shelduck (5-year mean peak of 14,345 and 4,515 birds respectively). The number of Shelduck in the Humber Estuary has remained relatively stable with Pink-footed Goose showing a long-term increase (Ref 10-23; Ref 10-22). Other commonly occurring wildfowl include Teal, Dark-bellied Brent Geese, Wigeon, Greylag Goose and Mallard (Ref 10-20). Pink-footed Goose are recorded in large numbers at Read's Island with Dark-bellied Brent Geese and Wigeon, principally occur in areas along the southern shore from Cleethorpes to Saltfleetby (Ref 10-21).

10.3.17 Black-headed Gull (5-year mean peak of 11,217 birds) as well as Herring Gull and Common Gull (occurring in lower numbers) are widespread in the Humber Estuary.

10.3.18 The Humber Estuary also supports several heron species including Grey Heron, Little Egret and Great Bittern. Grey Heron and Little Egret are recorded in a wide variety of intertidal and coastal habitats with Great Bittern recorded within reedbed habitats such as around Blacktoft Sands, Far Ings, Barton and North Killingholme Haven clay pits (Ref 10-21).

10.3.19 Diving birds occurring in the Humber Estuary include Common Scoter and Goldeneye (5-year mean peak of 682 and 329 birds respectively) with Cormorants and Tufted Duck also occurring in relatively large numbers.

10.3.20 Little Tern breed at Easington Lagoon, which is located approximately 20 km from the Project (Ref 10-21), with data suggesting this species forages within 5 km of nesting sites (Ref 10-34. Sandwich Tern (5-year mean peak of 686 birds) and Common Tern (5-year mean peak of 476 birds) are also regularly recorded, particularly in passage periods in the Humber Estuary.

Immingham area

10.3.21 Pre and post consent monitoring of coastal waterbird surveys as part of the IOH development have been undertaken annually since winter 1997/98. The foreshore in the area of the Project overlaps with 'Sector C' (between the Immingham Oil Terminal Jetty and Oldfleet Drain (as shown in **Figure 10.1** (PEI Report, Volume III)). The most recent 5-years of data (2017/18 to 2021/22) has been analysed for this sector (Table 10.6). During this period, surveys were undertaken between October and March twice a month[7]. During each survey, either five counts (October and March) or four counts (November to February) were undertaken every two hours after high water. In addition, the 2021/22 survey season started early in August rather than October. The surveys have continued on a monthly basis in 2022 rather than stopping in March as per previous years. On this basis, the results from passage and summer months (August and September 2021 and April to August 2022) have been presented separately (Table 10.7).

10.3.22 To summarise the findings from the survey work, the annual peak count (maximum count from each winter period between October and March) for birds feeding, roosting as well as the combined total[8] is presented in **Table 10.6**. The 5-year average of the annual peak counts for each species (referred to as the mean peak)[9] is also presented in **Table 10.6**. This table also compares the 5-year mean peak against the thresholds and values outlined below, to provide objective criteria to help determine the value of the area in an international, national and regional context:

a. **Internationally Important Threshold Level**: The threshold for an individual species (or subspecies) is set at 1% of the biogeographic population[10];

b. **Nationally Important Threshold Level:** The threshold for an individual species (or subspecies) is set at 1% of the British population i.e. if a site supports more than 1% of the British population it is considered Nationally Important (for that species or subspecies); and

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7 Passage surveys have been undertaken on a weekly basis in March and April 2022 and will also be undertaken on a weekly basis from September to November 2022 to provide further data on abundances during these periods.

8 The combined peak count is a summed value derived from the largest count of both feeding and roosting birds during the same hourly count.

9 It is standard practice to present the average of the annual peaks for a certain duration of time (sometimes referred to as the mean of peaks). This is calculated as the average of the maximum annual counts and for the most recent 5-years of available data if possible. Mean peaks (using five years of winter values) is the approach presented in the WeBS annual reports. For most migratory species, the WeBS 5-year mean of peak is also the value that is used when identifying qualifying features for each SPA. Using mean of peaks is also useful for characterising the relative importance of sectors within a site, as it gives a good indication of how many individuals of a given species a sector typically supports (Ref 10-35).

10 The thresholds levels are available at: https://www.bto.org/volunteer-surveys/webs/data/species-threshold-levels. It should be noted that, where 1 % of the population is less than 50 birds, 50 is normally used as a minimum qualifying threshold for the designation of sites of national or international importance (accessed 04/04/22) (Ref 10-36).

c. **Latest Humber Estuary WeBS Core Counts 5-year average:** The 5-year mean peak from the latest Humber Estuary WeBS Core Counts. Core Count surveys are typically undertaken around high water. Within this assessment, this is from 2015/16 to 2019/20 (Ref 10-20). It should be noted that as a result of COVID-19 lockdowns, the BTO were unable to undertake comprehensive counts and therefore produce robust data for 2020/21 at an estuary-wide scale and therefore the period 2015/16 to 2019/20 is the most recent 5 years of data available from the BTO. For the purposes of this assessment, numbers representing more than 10 % of the estuary-wide Core Counts for an individual species are considered regionally important and numbers representing between 1 % and 10 % are considered locally important [11].

10.3.23 The 5-year mean peak number of birds in Sector C during different months is presented in **Figure 10.3** (PEI Report, Volume III) to show any seasonal trends over the winter period. The distribution of birds within Sector C based on distribution data collected in the surveys is shown in **Figure 10.4** (PEI Report, Volume III).

10.3.24 During the surveys, over 25 waterbird species have been recorded on the foreshore within Sector C with approximately 20 species considered regularly occurring.

10.3.25 The most numerous wading bird species recorded foraging within the area over this period were Black-tailed Godwit and Dunlin (5-year mean peaks of 1361 and 519 birds respectively). It should be noted that during winter 2017/18, 2018/19 and 2019/20 Black-tailed Godwit were recorded in nationally important numbers (503, 944 and 752 birds respectively) and in internationally important numbers in 2020/21 and 2021/22 (2016 and 2591 birds respectively) (**Table 10.7**). Other wading birds regularly recorded but in lower numbers included Bar-tailed Godwit, Redshank, Turnstone, Oystercatcher and Curlew. Shelduck were the most abundant wildfowl species recorded foraging (5-year mean peak of 131 birds). Lower numbers of other ducks such as Teal and Mallard were also recorded.

10.3.26 With respect to roosting birds, Black-tailed Godwit was the most numerous species recorded (5-year mean peaks of 514 birds). Other species regularly recorded roosting included Shelduck and Curlew (5-year mean peak of 32 and 27 birds, respectively) as well as Knot, Redshank and Turnstone.

[11] The 1% local threshold has been requested to be used in the baseline data analysis by Natural England as part of previous developments on the Humber Estuary.

Table 10.7: Coastal waterbird species recorded within Sector C during the last five winters

Species	Peak count per winter (feeding)						Peak count per winter (roosting)						Peak count per winter (combined – non-behavioural)					
	17/18	18/19	19/20	20/21	21/22	MP	17/18	18/19	19/20	20/21	21/22	MP	17/18	18/19	19/20	20/21	21/22	MP
Avocet			42	2		9			64			13			64	2		13
Black-headed Gull					83	17											83	17
Bar-tailed Godwit	48	30	54	45	141	64		2		3		1	48	30	54	45	141	64
Black-tailed Godwit	503	944	752	2016	2591	1361	280	1	1352	700	238	514	503	944	1352	2016	2591	1361
Common Gull					1	<1					8	2					8	2
Cormorant							1	1				<1	1	1				<1
Curlew†	23	35	24	35	37	31	37	11	14	57	16	27	37	35	24	57	37	31
Dunlin	541	371	571	554	556	519	16	9	110	6	4	29	541	371	571	554	556	519
Great Black-Backed Gull					1	<1											1	<1
Gadwall			1			<1									1			<1

Species	Peak count per winter (feeding)						Peak count per winter (roosting)						Peak count per winter (combined – non-behavioural)					
	17/18	18/19	19/20	20/21	21/22	MP	17/18	18/19	19/20	20/21	21/22	MP	17/18	18/19	19/20	20/21	21/22	MP
Golden Plover					13	3				4		1				4	13	3
Goldeneye					1	<1											1	<1
Grey Plover†	14		11	20	75	24				1		<1	14		11	20	75	24
Herring Gull					13	3					2	<1					13	3
Knot		191	110	16	39	71			210	2		42		191	210	16	39	71
Lapwing†							1		1			<1	1		1			<1
Lesser Black-backed Gull					2	<1					2	<1					2	<1
Little Egret			3			1									3			1
Mallard†	3	2	3			2	2		2	2		1	3	2	3	2		2
Oystercatcher†	5	4	9	7	7	6	2	2	2	7	2	3	5	4	9	7	7	6
Pink-footed Goose										1		<1				1		<1

Species	Peak count per winter (feeding)						Peak count per winter (roosting)						Peak count per winter (combined – non-behavioural)					
	17/18	18/19	19/20	20/21	21/22	MP	17/18	18/19	19/20	20/21	21/22	MP	17/18	18/19	19/20	20/21	21/22	MP
Redshank	56	38	50	48	80	54	26	5	12	13	44	20	56	38	50	48	80	54
Ringed Plover†	2	3	12	25	2	9	13	1	7	22	16	12	13	3	12	25	16	12
Shelduck	109	152	125	139	128	131	16	26	64	35	18	32	109	152	125	139	128	131
Teal†	1	8	13	3		5							1	8	13	3		5
Turnstone†	19	15	21	28	32	23	5		15	18	17	11	19	15	21	28	32	23
Yellow-legged Gull					1	<1					76	15					76	15

SPA qualifying species highlighted in **bold.** † Species with this symbol are included within the SPA waterfowl assemblage.

	Cells highlighted green indicate the count is of local importance (> 1 %) of the current estuary wide WeBS 5-year MP.
	Cells highlighted orange indicate the count is of regional importance (> 10 %) of the current estuary wide WeBS 5-year MP.
	Cells highlighted blue indicate the count is of national importance. It should be noted that for Black-tailed Godwit the regional importance (> 10 % of the estuary wide WeBS 5-year MP – 455 birds) is higher than the national importance threshold (390 birds).
	Cells highlighted red indicate the count is of international importance.

10.3.27 As shown in **Figure 10.3** (PEI Report, Volume III), during the surveys, the largest numbers of wintering Black-tailed Godwit were recorded in October. The numbers of other wintering species were highly variable with no clear pattern.

10.3.28 The data collected during passage and summer periods (August to September 2021 and April to August 2022) recorded a range of species some of which were recorded in relatively large numbers (**Table 10.7**). The number of birds using Sector C was generally higher in the spring months (April to May) than in autumn passage months (August and September) with peak counts of 400 Dunlin and 581 Black-tailed Godwit recorded in the spring and 222 Dunlin and 160 Black-tailed Godwit in the autumn respectively. However, none of the peak counts during the passage period exceeded the winter mean peaks for the last five years.

10.3.29 All of the species observed in Sector C are frequently recorded in large numbers during both passage and winter periods in the Humber Estuary more widely with the estuary-wide peak abundances of passage birds typically showing a high degree of both monthly and annual variability. This would be expected given the more transient nature of passage birds with numbers fluctuating on a daily basis as birds arrive and depart from sites in the Humber Estuary (Ref 10-23).

10.3.30 Within Sector C, the largest numbers of waterbirds typically occur on mudflat in the east of the sector towards the Pyewipe mudflats near Grimsby. Within this area approximately 500 to 2000 Black-tailed Godwit, 100s of Dunlin as well as lower numbers (<50) of other species such as Shelduck, Redshank and Knot are regularly recorded (**Figure 10.4** (PEI Report, Volume III)).

10.3.31 Lower numbers of waterbirds are seen on the mudflat in the western section of Sector C (between the IOT Jetty and the mudflat fronting North Beck drain) including flocks of Black-tailed Godwit (typically < 100 birds), Turnstone, Curlew, Dunlin (typically<50-60 birds) as well as lower numbers of other species such as Oystercatcher, Redshank, Knot and Shelduck (<20 birds) (**Figure 10.4** (PEI Report, Volume III)).

10.3.32 The upper shore sea defences in the area are regularly used through the tide by individuals or small flocks of Turnstone (typically < 20 to 30 birds throughout the sector).

10.3.33 The assemblage recorded in the surveys is broadly similar to that recorded during the WeBS Core Counts for the period 2016/17 to 2020/21 (the most recent 5-years of data available from the BTO for the 'Immingham Docks Sector K'). The most commonly recorded species were Dunlin (mean peak of 165 birds), Redshank (mean peak of 83 birds), Black-tailed Godwit (mean peak of 47 birds) Shelduck (mean peak of 35 birds), Turnstone (mean peak of 44) and Curlew (mean peak of 11 birds). It is worth noting that this WeBS sector covers a much larger area than Sector C and so it is not directly comparable in terms of spatial

extent [12.] Core counts are also only typically undertaken around high water periods and so do not provide information through the tide or during low water periods.

[12] The sector includes foreshore adjacent to the Port of Immingham and also extents east of the IOT terminal jetty (https://app.bto.org/websonline/sites/data/sites-data.jsp#lon=-0.1652575&lat=53.6215984&zoom=14&type=BING) (Ref 10-37).

Table 10.8: Coastal waterbird species recorded within Sector C during August to September 2021 and April to August 2022

Species	Peak count per passage/summer month (feeding)							Peak count per passage/summer month (roosting)							Peak count per passage/summer (combined – non-behavioural)						
	Aug 21	Sept 21	Apr 22	May 22	Jun 22	Jul 22	Aug 22	Aug 21	Sept 21	Apr 22	May 22	Jun 22	Jul 22	Aug 22	Aug 21	Sept 21	Apr 22	May 22	Jun 22	Jul 22	Aug 22
Avocet			2	1													2	1			
Bar-tailed Godwit	2	3			248		3								2	3			248		3
Black Headed Gull			9	15	44	219	449			2	10	2	181	61			9	15	44	219	449
Black-tailed Godwit	66	160	581	106			39		13						66	160	581	106			39
Common Gull					20	21	1				6		5	34				6	20	21	34
Common Sandpiper	2					2		2							2					2	
Cormorant		1							1	1						1	1				
Curlew†	14	16	43	16	4	19	20	3	3	6	1	3	3	3	14	16	43	16	4	19	20
Dunlin	1	222	400				47	2	3						2	222	400				47
Golden Plover			12														12				

Species	Peak count per passage/summer month (feeding)							Peak count per passage/summer month (roosting)							Peak count per passage/summer (combined – non-behavioural)						
	Aug 21	Sept 21	Apr 22	May 22	Jun 22	Jul 22	Aug 22	Aug 21	Sept 21	Apr 22	May 22	Jun 22	Jul 22	Aug 22	Aug 21	Sept 21	Apr 22	May 22	Jun 22	Jul 22	Aug 22
Great Black-backed Gull			8	4		4	2					1					8	4	1	4	2
Herring Gull			13	2	4	7	16			21	6	2	8	1			21	6	4	8	16
Knot		6	4	26	3											6	4	26	3		
Lesser Black-backed Gull			6	1	1	14	4			2			4				6	1	1	14	4
Little Egret	2	1		1			1		1			1			2	1		1	1		1
Little Ringed Plover	3														3						
Mallard†	1														1						
Oystercatcher†			5	5	3	3	3	2	1	2	2				2	1	5	5	3	3	3
Redshank	6	7	24			13	9		2	1					6	7	24			13	9
Ringed Plover†		1			2								2			1			2	2	
Shelduck	88	90	12	5	2	8	116		42	10			3		88	90	12	5	2	8	116
Turnstone†	16	41	8				16	6	12	5			5		16	41	8			5	16

Species	Peak count per passage/summer month (feeding)							Peak count per passage/summer month (roosting)							Peak count per passage/summer (combined – non-behavioural)						
	Aug 21	Sept 21	Apr 22	May 22	Jun 22	Jul 22	Aug 22	Aug 21	Sept 21	Apr 22	May 22	Jun 22	Jul 22	Aug 22	Aug 21	Sept 21	Apr 22	May 22	Jun 22	Jul 22	Aug 22
Whimbrel	1		4	3		1									1		4	3		1	

SPA qualifying species highlighted in **bold.** † Species with this symbol are included within the SPA waterfowl assemblage.

	Cells highlighted green indicate the count is of local importance (> 1 %) of the current estuary-wide WeBS 5-year MP.
	Cells highlighted orange indicate the count is of regional importance (> 10 %) of the current estuary-wide WeBS 5-year MP.
	Cells highlighted blue indicate the count is of national importance. It should be noted that for Black-tailed Godwit the regional importance (> 1% of the WeBS 5-year MP – 455 birds) is higher than the national importance threshold (39 birds). The national importance threshold for Common Sandpiper and Whimbrel is set as 1.

Terrestrial Habitats (Passage and Wintering SPA/Ramsar Waterbirds)

10.3.34 Habitats within the majority of the land impacted by the pipeline route are unsuitable for coastal waterbirds, as they comprise scrub/woodland that are not suitable for high tide roosting/loafing/feeding waterbirds, and areas of land currently used for port-related storage/ operational areas.

10.3.35 The habitat within the former arable land off Kings Road is dominated by tall-swarded grassland having been abandoned from agricultural cultivation approximately ten years ago. Consequently, the habitats within the West Site are not suitable for high tide roosting/loafing/feeding waterbirds from the nearby Humber Estuary SPA/Ramsar. This is because there is insufficient scanning distance for birds to observe approaching ground-based predators, and they therefore typically avoid taller swarded grassland. This conclusion is supported by the findings of a limited suite of wintering bird surveys undertaken to coincide with the high tide period in February and March 2022, which did not record any SPA/Ramsar waterbird species (**Appendix 8.B** of PEI Report, Volume IV). Previous wintering bird surveys of these fields were undertaken for a 2013 Drax planning application (planning reference: DM/1027/113/OUT) also did not record any SPA/Ramsar waterbirds, and the habitats were concluded to be unsuitable for waterbirds. Further survey of these habitats for wintering/ passage SPA/Ramsar waterbirds was therefore scoped out.

10.3.36 The large arable field adjacent to the Humber Estuary within the temporary compound area off Laporte Road may be suitable for coastal waterbirds, given its proximity to intertidal feeding habitats. Surveys are ongoing across the passage and wintering period of 2022/2023[13] and the findings will be presented in the ES. Where locally important aggregations of SPA/Ramsar waterbirds are recorded within this field (i.e. at numbers >1% of the WeBS 5 year mean peak count), it will be concluded that the field is functionally linked to the Humber Estuary.

Breeding SPA/ Ramsar Species

10.3.37 There is no suitable habitat within the Site for breeding SPA/Ramsar species Bittern, Marsh Harrier or Avocet. Marsh Harrier has been previously recorded overflying the Site (at West Site) in 2013 (information contained within an ecology report submitted with planning application DM/1027/13/ OUT) but there are no extensive areas of reedbed/marsh habitat that would be suitable nesting habitat; the reedbed habitat within the Site (at West Site) is restricted to narrow bands within/on the margins of the ditches. Breeding SPA/Ramsar species are therefore not considered further and are scoped out of the assessment.

Breeding Non-SPA/Ramsar Species

Desk Study

10.3.38 The Lincolnshire Environmental Records Centre (LERC) desk study returned a number of records of breeding species within the study area, including five

[13] Terrestrial surveys will be undertaken twice monthly across the High Water period between September 2022 and March 2023 inclusive.

species listed on Annex I of the EC Birds Directive, 13 species listed on Schedule 1 of the Wildlife and Countryside Act (1981) (as amended) (Ref 10-13), 15 Species of Principal Importance (SPI), and respectively 16 Red List and seven Amber List species included in the Birds of Conservation Concern 5 (BoCC5). The records also include 14 species of bird that are priority species in Lincolnshire listed on the Lincolnshire BAP.

10.3.39 Previous breeding bird surveys of the West Site in 2013 for planning application DM/1027/113/OUT recorded the following breeding species on the West Site:

a. Grassland habitat: ground nesting skylark (*Alauda arvensis*) and meadow pipit (*Anthus pratensis*).

b. Ditches: reed warbler (*Acrocephalus scirpaceus*), sedge warbler (Acrocephalus schoenobaenus) and reed bunting (Emberiza schoeniclus).

c. Boundary hedgerows: blackcap (Sylvia atricapilla), chiffchaff (*Phylloscopus collybita*), willow warbler (*Phylloscopus trochilus*), whitethroat (*Sylvia communis*), lesser whitethroat (*Sylvia curruca*), tree sparrow (*Passer montanus*), yellowhammer (*Emberiza citrinella*), linnet (*Carduelis cannabina*) and song thrush (*Turdus philomelos*).

Breeding Bird Survey Method

10.3.40 The Common Bird Census (CBC) methodology was scaled down to five visits during the 2022 breeding bird season; this was considered adequate to provide a good indication of the breeding bird ornithological baseline for the purposes of an assessment of ornithological impacts.

10.3.41 The surveys involved recording all the birds observed, their locations and activity/behaviour. Contacts with birds (by song, call or sighting) were marked on the survey map using BTO species codes and standard behaviour notation[14].

10.3.42 Surveys were undertaken during the mornings in suitable weather conditions (unrestricted visibility, winds less than Beaufort 5 and not in continuous rain). Surveys of the land off Kings Road were undertaken on 17 March, 11 April, 05 and 25 May and 21 June 2022 to record breeding activity within this part of the Site, which was the only accessible area for survey in Spring 2022. Further survey work is necessary to characterise the breeding bird assemblage within Long Strip woodland and the Queens Road part of the site and will be undertaken in spring/summer 2023.

10.3.43 The survey maps were analysed to determine breeding activity for species of conservation concern and/or protected species according to the following categories:

a. Possible breeding – species present during the survey period in possible nesting habitat, but with no indication of breeding. Presumed passage migrants are not included.

[14] https://www.bto.org/sites/default/files/u10/downloads/taking-part/species_codes.pdf) (Ref 10-38)

b. Probable breeding – observations of one or more of the following activities during the survey period:
   i. singing male heard, or breeding calls heard.
   ii. pair observed in suitable nesting habitat during the survey period.
   iii. display or courtship.
   iv. birds visiting a probable nest site.
   v. birds seen to be carrying nesting material.
c. Confirmed breeding – observations of any one or more of the following activities during the survey period:
   i. agitated behaviour or anxiety calls from adults suggesting a nest or young close by.
   ii. distraction display or injury feigning from adults.
   iii. a nest has obviously been used or eggshells found.
   iv. adults seen carrying food for young.
   v. adults seen carrying faecal sac away from nest site.
   vi. nest with eggs.
   vii. nest with young or downy young in the case of waders, game birds etc.
   viii. recently fledged young.
   ix. soliciting calls from young birds.
d. Non-breeding – species present during the survey period however the habitat type within the survey area is unsuitable for the particular species (for example passage migrants).

Breeding Bird Survey Results

10.3.44 A detailed breeding bird report will be prepared as a technical appendix to the ornithology chapter of the ES, but the results of the surveys undertaken to date are summarised below. The assemblage recorded is similar to that recorded on the West Site area during previous surveys in 2013 (information contained within an ecology report submitted with planning application DM/1027/13/OUT).

Table 10.9: Summary of Breeding Birds Recorded in Land off Kings Road

English Name	Scientific Name	Birds of Conservation Concern 5 (BOCC5)	Annex 1 of the EU Birds Directive (Annex 1)	Schedule 1 Wildlife and Countryside Act 1981 (Schedule 1)	UK Biodiversity Action Plan Priority Species (UK BAP)	NERC Act 2006	Breeding Status (Confirmed, Probable, Possible or Not Breeding)	Territories/breeding pairs within West Site area
Pheasant	*Phasianus colchicus*						Probable	1
Woodpigeon	*Columba palumbus*	Amber					Probable	2
Blue Tit	*Cyanistes caeruleus*						Possible	1
Great Tit	*Parus major*						Possible	1
Skylark	*Alauda arvensis*	Red			✓	s.41 species	Probable	1
Cetti's Warbler	*Cettia cetti*			✓			Probable	1
Long-tailed Tit	*Aegithalos caudatus*						Probable	1
Willow Warbler	*Phylloscopus trochilus*	Amber					Probable	1

English Name	Scientific Name	Birds of Conservation Concern 5 (BOCC5)	Annex 1 of the EU Birds Directive (Annex 1)	Schedule 1 Wildlife and Countryside Act 1981 (Schedule 1)	UK Biodiversity Action Plan Priority Species (UK BAP)	NERC Act 2006	Breeding Status (Confirmed, Probable, Possible or Not Breeding)	Territories/breeding pairs within West Site area
Chiffchaff	*Phylloscopus collybita*						Probable	1
Sedge Warbler	*Acrocephalus schoenobaenus*	Amber					Probable	3
Reed Warbler	*Acrocephalus scirpaceus*						Probable	2
Blackcap	*Sylvia atricapilla*						Possible	1
Whitethroat	*Sylvia communis*						Probable	3
Wren	*Troglodytes troglodytes*	Amber					Probable	4
Blackbird	*Turdus merula*						Probable	1
Song Thrush	*Turdus philomelos*	Amber			✓	s.41 species	Probable	1
Robin	*Erithacus rubecula*						Probable	1
Meadow Pipit	*Anthus pratensis*	Amber					Probable	1

English Name	Scientific Name	Birds of Conservation Concern 5 (BOCC5)	Annex 1 of the EU Birds Directive (Annex 1)	Schedule 1 Wildlife and Countryside Act 1981 (Schedule 1)	UK Biodiversity Action Plan Priority Species (UK BAP)	NERC Act 2006	Breeding Status (Confirmed, Probable, Possible or Not Breeding)	Territories/breeding pairs within West Site area
Chaffinch	*Fringilla coelebs*						Probable	1
Linnet	*Linaria cannabina*	Red			✓	s.41 species	Probable	1
Goldfinch	*Carduelis carduelis*						Probable	1
Reed Bunting	*Emberiza schoeniclus*	Amber			✓	s.41 species	Probable	3
Magpie	*Pica pica*						Not breeding	
Carrion crow	*Corvus corone*						Not breeding	
Dunnock	*Prunella modularis*	Amber			✓	s.41 species	Not breeding	
Yellowhammer	*Emberiza citrinella*	Red			✓	s.41 species	Not breeding	

10.3.45 One probable breeding pair of the Annex I species Cetti's warbler was recorded within the West Site area. Cetti's warbler, a previously rare UK species restricted to the southern region, has rapidly expanded its breeding range north and is now referred to in the Lincolnshire Bird Atlas as an "…*increasing breeding resident and passage migrant/winter visitor in Lincolnshire*."[15] Cetti's warbler has also been recently (in 2019) taken out of the UK Rare Breeding Birds Panel annual reports, reflecting its substantial increases in breeding numbers and range across the country. The south bank of the Humber was reported to support 93 singing males at the time of the 2021 Lincolnshire Bird Atlas publication, and it is therefore concluded to be relatively widespread in suitable habitats along the south bank of the Humber in North East/North Lincolnshire.

10.3.46 Two Red List species of high conservation concern were recorded probably breeding, with one pair each of skylark and linnet recorded within the West Site area. There were seven Amber List species of moderate conservation concern recorded as probably breeding within the Site, with sedge warbler and reed bunting being present on several of the overgrown ditches within the Site where there was an abundance of common reed to provide nesting sites for these species.

10.3.47 A total of 22 possible/probable breeding species were recorded within the West Site. Based on the criteria published by Fuller[16], this assemblage would fall beneath the 'Local' significance band of 25 to 49 breeding species. As no rare or notable species were recorded, it is therefore concluded that the breeding bird assemblage is of Site value to nature conservation.

10.3.48 Land off Queens Road and Long Strip woodland would be expected to support a range of breeding bird species commonly found within woodland habitats, and may be reasonably concluded to be of Site or Local value to nature conservation following the completion of surveys within the habitat.

Future Baseline

10.3.49 In the absence of the Project, the current marine coastal processes would remain the same as described in **Chapter 16: Physical Processes**.

10.3.50 Marine species are likely to become increasingly vulnerable to anthropogenic pressures in the future due to the predicted effects of climate change and ocean acidification in combination with more local pressures. The 2020 MCCIP report card (Ref 10-40) highlighted the following changes to ecology receptors could potentially occur as a result of climate change:

a. Sea-level rise could result in deeper waters and larger waves reaching saltmarsh and other intertidal habitats, causing erosion at the seaward edge;

b. Changes in patterns of rainfall or temperature changing vegetation composition of coastal saltmarsh communities;

[15] Casey, C., Clarkson, J.R., Espin, P. and Hyde, P.A. (2021) *Birds of Lincolnshire*. Published by the Lincolnshire Bird Club. Ref 10-39.
[16] Fuller, R.J. (1980) *A method for assessing the ornithological interest of sites for nature conservation*. British Trust for Ornithology, Hertfordshire, UK. (Ref 10-41).

c. Marine communities around the UK altering as ocean acidification increases;

d. Changing sea temperatures resulting in range shifts for both benthic species and mobile species (such as fish, marine mammals). This could result in a decline of some cold-water species around certain parts of the UK and an increase in the prevalence of non-native species;

e. Changing temperatures affecting spawning in some marine species as well as the timings of migrations;

f. Coastal waterbirds showing north-easterly shifts in the winter distributions in Europe; and

g. Changes in prey distribution and availability, resulting in range shifts in some regional populations of marine mammals, fish and seabirds.

10.3.51 Data suggests that ecological changes linked to climate change (such as range shifts) are already occurring although there is currently a high degree of uncertainty with respect to predicting the magnitude of potential effects in the future.

10.4 Development Design and Impact Avoidance

Standard Mitigation Measures

Impacts on Nesting Birds (construction)

10.4.1 Vegetation clearance will be undertaken outside the nesting bird season where possible, and clearance works will be avoided in the period March to August inclusive to ensure compliance with the Wildlife and Countryside Act (1981) (as amended) (Ref 10-13).

10.4.2 Where this is not possible, pre-clearance checks of vegetation would be undertaken to identify any nesting species. If occupied nests are identified, an appropriate buffer zone (at least 2 m) would be established around the nest to ensure it is protected from damage/ destruction during construction. No clearance of vegetation within the buffer zone would be undertaken until any young had fledged and the nest was confirmed to be unoccupied.

10.5 Potential Impacts and Effects

10.5.1 The preliminary assessment has identified the potential likely effects on ornithology receptors as a result of the construction and subsequent operation of the Project.

10.5.2 The Physical Processes assessment (**Chapter 16: Physical Processes** and Water and Sediment Quality assessment (**Chapter 17: Marine Water and Sediment Quality**) have informed the outcomes of the ornithology assessment.

10.5.3 Potential impacts on features of internationally designated sites (SACs, SPAs and Ramsar sites) have been assessed in **Section 10.5** and will also be assessed within the HRA (**Appendix 9.C** (PEI Report, Volume IV))

10.5.4 It is noted that the Killingholme Haven Pits Site SSSI which is located approximately 6km away from the Project could be functionally linked to the

mudflat habitat in the Project footprint with local populations of species such as Dunlin and Black-tailed Godwit potentially utilising both areas. However, Killingholme Haven Pits is considered too distant to be impacted directly by the Project (such as through potential disturbance effects). Based on the predicted magnitude of potential effects and proposed mitigation, indirect impacts on the SSSI (e.g., changes in local population levels resulting from changes in distribution or mortality) are also expected to be negligible.

10.5.5 The Lagoons SSSI is located approximately 20km from the Project with Little Tern a notified feature of the SSSI. However, data suggests that this species forages within 5km of nesting sites (Ref 10-34) with this species considered very rare within the Immingham area. On this basis, this notified feature will not overlap with any potential direct or indirect changes resulting from the construction and operational activities associated with the Project which are limited to within the vicinity of the Port of Immingham.

10.5.6 Cumulative impacts on ornithology receptors that could arise as a result of other coastal and marine developments and activities in the Humber Estuary combined with the project are considered as necessary and is assessed as part of **Chapter 25: Cumulative Effects and In-Combination Effects**.

Construction

10.5.7 This section contains a preliminary assessment of the potential impacts to ornithology receptors as a result of the construction phase of the Project. Potential effects during the construction phase that are considered relevant are reviewed in **Table 10.10**. It should be noted that the table includes the rationale for the scoping in or out of individual pathways for further assessment in this PEI Report.

10.5.8 The construction of the Project may be completed in a single stage, or it may be sequenced such that the construction of Berth 2 takes place at the same time as operation of Berth 1 (see **Chapter 2: The Project**). In the case of a sequenced construction, the duration of construction will be extended with both construction and operational disturbance stimuli potentially occurring concurrently. However, both berths will be over 1 km offshore and therefore no disturbance responses in roosting and feeding waterbirds utilising nearby intertidal habitat are expected to occur due to Berth 2 construction (with the approach jetty which directly overlaps with the intertidal already constructed for Berth 1). Potential disturbance in operation is expected to be relatively limited given the nature of the activities and expected habituation. Therefore, the assessment below is considered the worst case and will not be altered by a sequenced construction period.

Table 10.10: Potential effects during construction scoped in / out of further detailed assessment

Impact Pathways/ Potential Effects	Project activity	Included in assessment?	Justification
Direct loss to intertidal feeding and roosting habitat as a result of the piles	Piling	Yes	Piling would result in the small loss of intertidal habitat. This impact pathway has, therefore, been scoped into the assessment.
Direct changes to waterbird foraging habitat as a result of the capital dredge and dredge disposal	Capital dredge and dredge disposal	No	The footprint of the capital dredge and dredge disposal sites do not overlap with the intertidal and would not cause any direct changes to intertidal feeding and roosting habitat. Capital dredging and dredge disposal at sea has the potential to cause impacts to seabed habitats which could cause changes to the prey resources available for seabirds and other diving birds. However, the seabed in the vicinity of the berth pockets and at the disposal sites are highly dynamic and subject to regular physical disturbance as a result of maintenance dredging and strong tidal currents. These areas are likely to provide a limited prey resource and are also not known to support large populations of diving birds/seabirds. This impact pathway has, therefore, been scoped out of the assessment.
Indirect changes to foraging and roosting habitat as a result of changes to hydrodynamic and sedimentary processes	Marine works (capital dredging and piles)	Yes	The capital dredge and piling structures has the potential to result in changes to hydrodynamic and sedimentary processes (e.g. water levels, flow rates, changes to tidal prism, accretion and erosion patterns) which could cause changes to intertidal feeding and roosting habitat. This impact pathway has, therefore, been scoped into the assessment.
	Dredge disposal	No	Dredge disposal has the potential to result in changes to hydrodynamic and sedimentary processes (e.g. water levels, flow rates, changes to tidal prism, accretion and erosion patterns). The seabed in the vicinity of the disposal sites are highly dynamic and

Impact Pathways/ Potential Effects	Project activity	Included in assessment?	Justification
			subject to regular physical disturbance as a result of maintenance dredging and strong tidal currents. As described in more detail in **Chapter 16: Physical Processes**, only minor changes in flow rates and subtidal seabed morphology are predicted which are not expected to modify existing subtidal habitat types found in the area (i.e. mobile sand habitats characterised by an impoverished infaunal assemblage). On this basis, these areas are likely to provide a limited prey resource and are also not known to support large populations of diving birds/seabirds. This impact pathway has, therefore, been scoped out of the assessment.
Changes to seabed habitats and species as a result of sediment deposition during piling	Piling	No	Piling has the potential to result in the localised resuspension of sediment as a result of seabed disturbance. The amount of sediment that settles out of suspension back onto the seabed as result of piling is expected to be negligible and benthic habitats and species are not expected to be sensitive to this level of change. This impact pathway has, therefore, been scoped out of the assessment for coastal waterbirds in terms of changes to supporting habitat and prey resources
Direct loss of terrestrial habitats that are functionally linked to the Humber Estuary SPA/ Ramsar	Construction	Yes	Large arable field within temporary construction area off Laporte Road may be suitable for high tide feeding, roosting and loafing waterbirds. This impact pathway is considered in more detail below. No other terrestrial habitats within the Site boundary are suitable for coastal waterbirds.
Direct loss of breeding bird (SPA/ Ramsar) habitats	Construction	No	No suitable habitats for breeding SPA/Ramsar species are present within the Site. This impact pathway has, therefore, been scoped out of the assessment

Impact Pathways/ Potential Effects	Project activity	Included in assessment?	Justification
Direct loss of breeding bird (non-SPA/ Ramsar) habitats	Construction	Yes	The breeding bird assemblage on the Land off Kings Road part of the Site is evaluated to be of Site nature conservation importance and is therefore not scoped in as a relevant ecological feature for the purposes of impact assessment. The woodland habitat within Land off Queens Road/Long Strip has not yet been surveyed, although given the relatively low diversity of the woodland habitats, and thus the limited nature of the habitats for nesting species, it is not anticipated that the woodland would support a particularly important assemblage of nesting birds. However, the precautionary principle has been applied for the PEI Report and this feature is scoped into the impact assessment.
Airborne noise and visual disturbance to coastal waterbirds using intertidal habitats	Construction	Yes	During construction, there is the potential for airborne noise and visual disturbance to affect coastal waterbirds. This impact pathway is considered in more detail below.
Airborne noise and visual disturbance to coastal waterbirds using functionally linked terrestrial habitats outside the boundary of the Humber Estuary SPA/ Ramsar	Construction	Yes	During construction, there is the potential for airborne noise and visual disturbance to affect coastal waterbirds using functionally linked land. This impact pathway is considered in more detail below.
Noise and visual disturbance during capital dredge disposal	Capital dredge and dredge disposal	No	During dredge disposal, there is the potential for the dredging vessel to cause noise and visual disturbance. However, only a very small increase in vessel movements in the vicinity of the disposal site due to the capital dredge activity will occur. In addition, these areas are also not known to support large populations of diving birds/seabirds. Research has shown that disturbance to birds from vessel movements generally occurs within 50 to 100 m with vessels

Impact Pathways/ Potential Effects	Project activity	Included in assessment?	Justification
			approaching at faster speeds eliciting higher disturbance (Ref 10-42; Ref 10-43; Ref 10-44). However, it is acknowledged that some species such as Red-throated Diver and Common Scoter are considered particularly sensitive to disturbance from vessels and could be disturbed at greater distances (Ref 10-44; Ref 10-45; Ref 10-46; Ref 10-47. Any potential disturbance stimuli caused by the capital dredge disposal would be restricted to a localised area in the vicinity of the vessel for most species with even sensitive species (such as as Common Scoter) expected to temporarily redistributed locally, rather than dispersing out of the area. In addition, vessels will only be at the disposal sites for short durations of time with any birds that might be temporarily flushed able to return to feeding following cessation of the capital dredge disposal activity. In addition, the foraging ranges of diving bird species encompasses an extensive area which will not be spatially restricted to the disposal sites which are not considered to be important foraging areas for diving bird species. In addition, it should be noted that due to the high levels of existing maintenance dredging activities within the area, seabirds and other diving birds foraging in the dredge footprint would be expected to be reasonably habituated to vessels with more sensitive species already likely to be avoiding this area. This impact pathway has, therefore, been scoped out of the assessment.

10.5.9 This section contains a preliminary assessment of the potential impacts to coastal waterbird receptors as a result of the construction phase of the Project. The following impact pathways have been assessed:

a. Direct loss to intertidal feeding and roosting habitat as a result of the piles;

b. Direct loss of terrestrial habitat that are functionally linked to the Humber Estuary SPA/Ramsar;

c. Direct loss of breeding habitat used by non-SPA/ Ramsar birds;

d. Indirect changes to intertidal foraging and roosting habitat as a result of changes to hydrodynamic and sedimentary processes; and

e. Airborne noise and visual disturbance to coastal waterbirds using intertidal habitats and functionally linked terrestrial habitats outside the boundary of the Humber Estuary SPA/ Ramsar Site.

Direct loss to intertidal feeding and roosting habitat as a result of the piles

10.5.10 The piles will cause a direct loss of 0.017 ha of intertidal mudflat habitat.

10.5.11 The loss of habitat represents approximately 0.000046 % of the Humber Estuary SPA/Ramsar[17]. When considering this in the context of intertidal, the area of loss represents approximately 0.000196 % of intertidal foreshore habitats[18] and approximately 0.000274 % of mudflat[19] within the SPA/Ramsar.

10.5.12 This habitat loss is therefore clearly negligible in the context of the Humber SPA and Ramsar.

10.5.13 The loss of habitat due to piling will also be highly localised and considered de minimis in extent. The loss is also considered to be a magnitude that will not change the overall structure or functioning of the nearby mudflats within the Port of Immingham area or more widely in the Humber Estuary.

10.5.14 On this basis, any change to prey resources for birds feeding in the local area will be negligible. Individual survival rates or local population levels (either directly through mortality or due to birds dispersing to new feeding areas in other areas of the Humber Estuary) will not be affected.

10.5.15 Based on the available information provided above, the potential impact at this preliminary stage has been assessed as **not significant**.

[17] Based on the extents given in the Standard Data Form on the JNCC website (Ref 10-25)
[18]Based on using the 'Intertidal Substrate Foreshore (England and Scotland)' data layer (https://magic.defra.gov.uk/Metadata_for_MAGIC/SPIRE%20intertidal%20substrate%20foreshore.pdf (Ref 10-48)
[19] Based on using mudflat data layer of the Priority Habitat Inventory (England) (https://data.gov.uk/dataset/4b6ddab7-6c0f-4407-946e-d6499f19fcde/priority-habitat-inventory-england). (Ref 10-49).

Indirect changes to intertidal foraging and roosting habitat as a result of changes to hydrodynamic and sedimentary processes

10.5.16 Numerical modelling has been carried out to investigate the extent of changes to intertidal habitat from the marine works (capital dredge and piling) and is presented in detail in **Chapter 16: Physical processes**. It should be noted that predicted changes are primarily as a result of the capital dredging with the effects due to the presence of the piles having a negligible, localised effect.

10.5.17 Slight increases to local peak ebb current speed landward of the berth pocket are predicted to cause a limited amount of erosion of the bed along part of the lower intertidal (at the elevation of MLWS) beneath the landward ends of the proposed jetty. This will result in a potential indirect loss in intertidal area (approximately 0.01 ha). The assessment indicates that once the softer upper layer is removed, the harder, more consolidated, underlayer of bed material is unlikely to erode further. This calculation represents a worst-case assessment of potential elevation changes and has been considered on a precautionary basis. The level of predicted change is at the limit of the accuracy of the modelled data and, in real terms, is likely to be immeasurable against the context of natural variability (as a result of storm events, for example).

10.5.18 This loss represents 0.000027 % of the Humber Estuary SPA/Ramsar[20]. When considering this in the context of intertidal area, the area of loss represents approximately 0.000113 % of intertidal foreshore habitats[21] and approximately 0.000157 % of mudflat[22] within the SPA.

10.5.19 The predicted intertidal loss also consists of a very narrow strip on the lower shore around the sublittoral fringe and is considered to have limited functional value to waterbirds which utilise the foreshore in this location (such as Black-tailed Godwit, Turnstone, Curlew, Dunlin, Oystercatcher, Redshank, Knot and Shelduck) (**Table 10.7**).

10.5.20 Based on the available information provided above, the potential impact at this preliminary stage has been assessed as **not significant**

Direct loss of terrestrial habitats that are functionally linked to the Humber Estuary SPA/ Ramsar

10.5.21 At present there is no survey data to inform an evaluation of whether the arable land within the temporary construction compound off Laporte Road is functionally linked to the Humber Estuary SPA/Ramsar. However, given the proximity of the land to the intertidal feeding habitats, and that the land use would render it

[20] Based on the extents given in the Standard Data Form on the JNCC website (JNCC, 2022b)
[21] Based on using the 'Intertidal Substrate Foreshore (England and Scotland)' data layer (https://magic.defra.gov.uk/Metadata_for_MAGIC/SPIRE%20intertidal%20substrate%20foreshore.pdf
[22] Based on using mudflat data layer of the Priority Habitat Inventory (England) (https://data.gov.uk/dataset/4b6ddab7-6c0f-4407-946e-d6499f19fcde/priority-habitat-inventory-england).

suitable for high tide roosting, feeding and loafing waterbirds across the high tide period, a precautionary approach has been taken to the preliminary assessment.

10.5.22 The construction phase of the Project would result in the temporary displacement of waterbirds from this habitat for the duration of construction, although the land would not be permanently lost.

10.5.23 In the absence of mitigation, there is the potential for the loss of functionally linked land during construction to result in an adverse effect on high tide roosting, loafing and feeding SPA/Ramsar waterbirds, which may be significant in the context of the Estuary populations depending on the numbers of species, and the regularity with which they are present (i.e. how seasonally important the land is to wintering/ passage waterbirds).

Direct loss of breeding bird (non-SPA/ Ramsar) habitats

10.5.24 The loss of woodland within Long Strip may will result in an adverse effect on breeding birds, due to the permanent nature of the habitat impacts and thus the permanent displacement of nesting pairs. However, the magnitude of the impact and the significance of the effect cannot be determined until further survey work has been undertaken, and the extent of woodland loss quantified.

10.5.25 At this stage it is assumed, based on the relatively limited diversity of the woodland, that any breeding bird assemblage would be reasonably likely to be evaluated to be of Site or Local value to nature conservation. Therefore applying the precautionary principle, it is assessed that the permanent loss of breeding bird territories within the woodland is likely to result in a moderate adverse effect, that would be **significant** (Site or Local level).

Airborne noise and visual disturbance to coastal waterbirds using intertidal habitats

10.5.26 Within the construction site, the level of disturbance stimuli is dependent on the type of activity being undertaken. In general, human presence on or near the foreshore (e.g. walking) is considered to cause greater disturbance than vehicles or watercraft and waterbirds are more easily disturbed by irregular movements than the regular and defined presence of machinery, vessels and other vehicles (Ref 10-50; Ref 10-51; Ref 10-52; Ref 10-53; Ref 10-54).

10.5.27 High level responses to noise (such as dispersal away from marine works) are typically associated with sudden noise over 60 dB (at the receiver (i.e. bird) location not the noise source) or irregular noise over 70 dB (Ref 10-55). However, visual disturbance associated with construction activity will often create a disturbance effect before any associated noise starts to have an effect particularly in those species sensitive to visual stimuli (Ref 10-55). It should be noted that the predicted noise levels associated with piling and other construction activities were not available in time for the PEI Report but will be included in the ES.

10.5.28 The specific responses that waterbirds will have to disturbance varies between species with some ducks (such as Shelduck) and larger waders such as Curlew, Grey Plover and godwits generally showing stronger responses to disturbance

stimuli than smaller waders (such as Turnstone, Dunlin and Sanderling) (Ref 10-56; Ref 10-57; Ref 10-58; Ref 10-55; Ref 10-57). The level of response to potential disturbance stimuli also varies considerably between birds of the same species. This is due to their previous experience of the disturbance (i.e. level of habituation) as well as a range of other factors such as environmental conditions, their state at the time of the disturbance (e.g. hungry or satiated) and the quality of their alternative foraging sites (Ref 10-60; Ref 10-61; Ref 10-62; Ref 10-56. Evidence suggests, however, that waterbirds generally show a flight response to construction activities and a presence of people (such as construction workers) on or near the foreshore at distances <200-300 m (and more typically between 20 m and 100 m for certain species such as Turnstone or Dunlin) (Ref 10-63; Ref 10-64; Ref 10-62; Ref 10-65; Ref 10-66; Ref 10-67; Ref 10-55; Ref 10-68; Ref 10-57; Ref 10-56; Ref 10-59; Ref 10-51). However, distances over 300 m have been recorded more occasionally for some sensitive species (Ref 10-55; Ref 10-56; Ref 10-59; Ref 10-57). A 300 m radius, however, is often commonly applied to construction works based on a broadly worst-case FID range for sensitive waterbirds (Ref 10-69).

10.5.29 The bird data suggest that the foreshore fronting the Project (i.e. the section of Sector C between the IOT Jetty and the mudflat fronting North Beck drain within approximately 400-500 m of the Project) is regularly used by a variety of feeding and roosting waterbirds including flocks of Black-tailed Godwit (typically < 100 birds), Turnstone, Curlew, Dunlin (typically <50-60 birds) as well as lower numbers of other species such as Oystercatcher, Redshank and Shelduck (<20 birds).

10.5.30 It should be noted that construction of the Jetty Platform will occur at distances of more than 1km from the foreshore. In addition, capital dredging of the berths will also be undertaken at distances of more than 1km from the foreshore. On this basis, responses are considered unlikely even in more sensitive species and these elements of construction are not considered further.

10.5.31 The approach jetty construction works will overlap directly with the foreshore. Noise stimuli caused by the vibro and percussive piling activity and the presence of jack-up or crane barges (causing both potential noise and visual disturbance stimuli) as well as other construction machinery, construction workers and plant activity are all potential sources of disturbance associated with the construction of the approach jetty.

10.5.32 The evidence reviewed above suggests that the response of waterbirds to disturbance stimuli is relatively limited at distances over 200-300m, particularly in areas subject to already high levels of existing anthropogenic activity (as found in the Port of Immingham area). On this basis while disturbance responses of waterbirds would be expected associated with approach jetty construction activity on or near the foreshore, the more offshore elements of the approach jetty at distances greater than 200m to 300m would be expected to cause limited responses in birds.

10.5.33 Waterbirds present in the area are expected to be habituated to some extent to anthropogenic activities (due to existing port operations) near the foreshore. Nevertheless, construction of the approach jetty is located in close proximity to

feeding and roosting habitats used by waterbirds. Avoidance responses or dispersive disturbance events resulting in the redistribution of waterbird flocks to nearby areas may occur relatively frequently for the duration of the construction. Rather than being displaced from the local area completely, birds would be expected to redistribute to nearby foreshore in the Immingham area and continue to feed and roost in these alternative locations following dispersal. It is acknowledged, however, that wintering waterbirds can show a high level of site fidelity and can sometimes either show reluctance to move to alternative sites or choose the nearest alternative site, despite potentially being of lower quality habitat (e.g. reduced prey resources and also subject to disturbance pressure) when compared to more optimal habitats further away) (Ref 10-31 Ref 10-70; Ref 10-71; Ref 10-72).

10.5.34 Based on the available information provided above, the potential impact at this preliminary stage has been assessed as potentially **significant**.

Operation

10.5.35 This section contains a preliminary assessment of the potential impacts to ornithology receptors as a result of the operational phase of the Project. These effects have been reviewed in **Table 10.11.** This section includes an explanation of the rationale that was adopted for scoping in or out individual pathways for further assessment.

Table 10.11: Potential effects during operation scoped in / out of further detailed assessment

Receptor	Impact Pathways/Potential Effects	Project activity	Included in more detailed assessment?	Justification
Coastal waterbirds	Direct changes to intertidal foraging and roosting habitat as a result of marine infrastructure	Berth operations	Yes	Marine infrastructure associated with the Project (such as the raised jetty structure) could potentially cause direct damage or reduced functionality to waterbird feeding and roosting habitat. It should be noted that this pathway relates to potential changes to foraging and roosting habitat as a result of the physical presence of marine infrastructure rather than the direct loss of intertidal mudflat habitat due to the infrastructure (i.e. the piles) which would be assessed in the construction phase. It should also be noted that this pathway specifically relates to the structures themselves rather than human activity on the infrastructure which is assessed in the disturbance pathway below. However, it is acknowledged that such effects are likely to be interrelated to some extent. This impact pathway is considered in more detail below.
	Airborne noise and visual disturbance to coastal waterbirds using intertidal habitats	Berth operations	Yes	During operation, there is the potential for airborne noise and visual disturbance to affect coastal waterbirds. This impact pathway has, therefore, been scoped into the assessment.
	Airborne noise and visual disturbance to waterbirds using terrestrial habitats	Berth operations	Yes	During operation, there is the potential for airborne noise and visual disturbance to affect coastal waterbirds using terrestrial land adjacent to the Humber Estuary. This impact pathway has, therefore, been scoped into the assessment.

10.5.36 This section contains a preliminary assessment of the potential impacts to coastal waterbird receptors as a result of the operational phase of the Project. The following impact pathways have been assessed:

a. Direct changes to intertidal foraging and roosting habitat as a result of the presence of the infrastructure;

b. Airborne noise and visual disturbance to coastal waterbirds using intertidal habitats; and

c. Airborne noise and visual disturbance to coastal waterbirds using terrestrial habitats.

Direct changes to intertidal foraging and roosting habitat as a result of the presence of infrastructure

10.5.37 For clarity it should be noted this pathway relates to potential changes to foraging and roosting habitat as a result of the physical presence of marine infrastructure. The direct loss of intertidal mudflat habitat due to the presence of the infrastructure (i.e. the piles) was assessed in the construction phase (**Paragraph 10.5.10**).

10.5.38 It should also be noted that this pathway specifically relates to the structures themselves rather than human activity on the infrastructure which is assessed in the disturbance pathway below. However, it is acknowledged that such effects are likely to be interrelated to some extent.

10.5.39 Waterbirds often show a preference for foraging in open spaces with clear sightlines when feeding so that scanning distances can be maximised. On this basis, certain species of coastal waterbirds might show a reluctance to approach tall anthropogenic structures or those that create enclosed spaces. One of the main reasons for not approaching a structure is thought to be the same as waders avoiding feeding near high banks, tall hedges/trees and in enclosed spaces (such as small fields surrounded by trees) (Ref 10-73, i.e. they are trying to avoid any sudden attack by a predator that may be hiding in or behind the structure. Just as raptors often exploit tall structures to aid prey detection, species that may be targeted by raptors would naturally avoid tall structures to minimise predation risk. Many waders and waterfowl may avoid areas in which their sightlines are reduced, even though in certain circumstances this may reduce the quantity of high-quality foraging habitat available to them or access to important roosting sites. However, it is often difficult to separate the direct impact of the structure from other factors associated with development, such as human activity causing potential disturbance stimuli (assessed below) (Ref 10-74).

10.5.40 The addition of anthropogenic structures to coastal waters can also result in a new habitat for colonising epibiota (such as mussels, periwinkles, limpets and barnacles) which are considered prey items for certain wading birds such as Turnstone, Oystercatcher and Purple Sandpiper. Certain species (such as Turnstone) are also regularly recorded feeding on epifaunal species which have colonised anthropogenic structures in the intertidal such as jetties and coastal defences (Ref 10-75).

10.5.41 Marine infrastructure associated with the Project (raised jetty structure, linkspan etc.), will not prevent any direct access to established roosting habitat used by coastal waterbirds in the area. In addition, shading caused by the structures would not be expected to cause significant changes to benthic prey resources used by coastal waterbirds as assessed above.

10.5.42 The approach jetty will be an open piled structure with large gaps between each of the piles and between the jetty deck and the foreshore seabed (i.e. the mudflat surface). This will minimise the enclosed feel and allow birds feeding near the structure to maintain sightlines. It should be noted that observations from the ornithology surveys in the area suggest that birds regularly feed in very close proximity to both the Eastern Jetty (approximately 1km from the Project) and the Immingham Oil Terminal approach jetty (approximately 500m from the Project) – which are both similar open piled structures - with species such as Redshank, Dunlin, Turnstone regularly recorded underneath jetties and Curlew, Shelduck and Black-tailed Godwit approaching them closely. On this basis, birds would be expected to show similar highly localised responses to structures associated with the Project with responses ranging from no avoidance for some species to potentially some local avoidance (i.e. directly underneath or in close proximity) for other species. This is unlikely, however, to change the overall distribution of waterbirds more widely along the foreshore fronting Immingham.

10.5.43 Based on the available information provided above, the potential impact at this preliminary stage has been assessed as **not significant.**

Airborne noise and visual disturbance to coastal waterbirds using intertidal habitats

10.5.44 Operational ports, wherever located, inevitably act as a potential source of disturbance in the coastal environment. Waterbird monitoring work in the vicinity of port locations has generally recorded limited evidence of birds on nearby intertidal habitat being disturbed through regular land side port operations with birds often becoming habituated (such as the movement of vehicles, cranes and cargo containers) (Ref 10-76; Ref 10-51). For example, Ref 10-69 reported that most species of waterbird assemblages utilising estuarine habitats adjacent to major infrastructure (such as power stations, jetties, bridges, port facilities etc) appear to be tolerant and will both roost and forage within less than 50 m of the working infrastructure. Waterbirds have also been recorded regularly feeding under large industrial jetties as well as roosting on jetties and harbour walls.

10.5.45 Disturbance events have also been recorded as part of the ongoing IOH monitoring in the Port of Immingham area since winter 2005/06[23]. This includes any potential disturbance due to operational activities on various jetties (such as the Immingham Oil Terminal (which includes vehicle activity), Western Jetty, Eastern Jetty and Immingham Bulk Terminal). During the surveys the vast majority of the disturbance observed was caused due to either raptors (such as peregrine and sparrowhawk), recreational activities (angling or dog walking) or

[23] These surveys have been undertaken twice a month from October to March (see Section 9.3 for further information on these surveys).

maintenance work on the seawall. Disturbance was also recorded on several occasions as a result of construction or maintenance work on several of the jetties. No disturbance, however, was recorded as a result of vessel movements or operational activity at or near the berths or jetties.

10.5.46 Operational disturbance stimuli could occur as a result of vessel movements associated with the Project. However, the nearest berth during spring tide periods will be located approximately 1km from intertidal mudflat used by coastal waterbirds. On this basis, disturbance responses are considered highly unlikely due to vessel movements and berthing operations.

10.5.47 Disturbance could potentially occur as a result of vehicles on the approach jetty near the intertidal. The movement of vehicles will typically be restricted to periods of vessel mooring and disembarkation. This will include movement along the approach jetty which will be located above the intertidal mudflats. In general, human presence on the foreshore (e.g. walking) is considered to cause greater disturbance than vehicles (Ref 10-52; Ref 10-53; Ref 10-62). With specific respect to activity associated with commercial operations and works, observations from monitoring and other studies (including specifically on the Humber Estuary), suggests that disturbance responses are typically greater for personnel in the open, compared to when enclosed within a vehicle at the same distances (Ref 10-69). Waterbirds are also considered more likely to habituate to vehicle movements which occur in a more predictable manner and in a spatially limited area compared to more erratic activity (such as quad bikes on the foreshore) (Ref 10-77; Ref 10-78; Ref 10-69).

10.5.48 Vehicle movements associated with the Project will be spatially limited and mostly restricted to linear routes (e.g. along the jetty) with no direct access to the foreshore. Vehicle movement will be undertaken at slow speeds (typically <12 miles per hour) and also in a predictable and consistent manner (i.e. producing the same type of visual/noise stimuli each time). Based on the evidence reviewed above, these are all attributes which support habituation and therefore are likely to limit disturbance responses. It should also be noted that many of the existing approach jetties in the Port of Immingham have some vehicular access. The IOT approach jetty in particular has regular vehicle movements with no disturbance associated with this activity recorded during the IOH bird surveys (**Section 10.3**). Furthermore, pipe racks on either side of the approach jetty (which are approximately 2m in height) will likely obscure the visibility that birds on the foreshore have to moving vehicles on the approach jetty and act as screens to some extent.

10.5.49 Regarding engineering and maintenance works, this activity is expected to be limited and only required occasionally.

10.5.50 The level of response that waterbirds will have to operations will be dependent to some extent on the sensitivity they have to anthropogenic disturbance stimuli. For example, species such as Turnstone and Dunlin are typically more tolerant than Shelduck, Curlew and godwits. The evidence presented above, however, suggests that birds are typically less affected by defined regular movements of people or vehicles near the shoreline (as occurs in port environments) than by random movements of people on the foreshore. Birds are regularly recorded

feeding nearby or below port structures such as jetties or pontoons and appear to be relatively tolerant to normal day-to-day port operational activities.

10.5.51 It is acknowledged, however, that disturbance can occur as result of any human activity irrespective of habituation, if the activity occurs in sufficiently close proximity to a species so as to trigger a responsive reaction. Given that vessel movements will be occurring close to the foreshore on the approach jetty, intermittent disturbance responses are, therefore, still possible. This may particularly be the case at first when birds are likely to be less habituated to the new activity or as a response to a more infrequent sporadic type of activity on a structure with which birds are less familiar (such as maintenance works which are likely to be highly infrequent). Responses for most species are expected typically to involve infrequent, mild behavioural responses in a localised area in the vicinity of the approach jetty. The responses observed in birds are likely to range from increased vigilance to short flights with birds rapidly resettling and resuming feeding near their original location.

10.5.52 Based on the available information provided above, the potential impact at this preliminary stage has been assessed as **not significant**.

Airborne noise and visual disturbance to coastal waterbirds using terrestrial habitats

10.5.53 Following the completion of construction, the temporary compound occupying the arable land off Laporte Road would be removed and it is assumed that it would be reverted to its previous agricultural use. It would therefore return to being suitable habitat for high tide feeding, roosting and loafing waterbirds, and may be considered functionally linked to the Humber Estuary when the Project is operational, if it supported waterbirds in aggregations >1% of the Humber Estuary 5-year peak mean. In this case, there is the potential for noise and visual disturbance arising from the operation of the Project to result in the disturbance/displacement of birds from this habitat.

10.5.54 As discussed above in respect of the potential for noise and visual disturbance to waterbirds on the intertidal habitats, waterbirds are already relatively habituated to normal day-to-day port operations such as vessel and vehicle movements associated with the foreshore/ intertidal area.

10.5.55 Operational activities associated with the jetty (vehicle/people movements) would be closer to the field than existing operations associated with the IOH jetty, but would be relatively well screened from any waterbirds within the field by retained woodland in Long Strip (which is adjacent to the western boundary of the field) and the raised flood embankment (around the north and east boundaries of the field). There is a public footpath running the length of the northern boundary of the field (on top of the flood embankment), and therefore any waterbirds using the field would be assumed to be tolerant of people/ vehicles (the path is used by the Environment Agency when undertaking maintenance works) on the flood embankment. There is also a public bridleway running along the eastern edge of the woodland, although this is screened to some degree from the field by the mature field boundary hedgerow; however, as stated above, it is reasonable to

assume that any waterbirds using the field are tolerant of existing recreational activity (or already modify their behaviour as a result).

10.5.56 It is therefore concluded that, even in the absence of evidence to demonstrate that the arable field is functionally linked to the Humber Estuary, if a precautionary approach is taken to the assessment, there would be a minor adverse effect arising from noise/visual disturbance during operation, that is **not significant**.

10.6 Mitigation and Enhancement Measures

Disturbance to coastal waterbirds during construction

10.6.1 In order to reduce the level of potential impact associated with noise and visual disturbance during construction, a number of mitigation measures are being considered including the use of soft start procedures, cold weather construction restrictions, seasonal working restrictions and the use of acoustic barriers and screening.

10.6.2 These mitigation measures would be further developed if required through ongoing engagement with statutory authorities as part of the statutory consultation process and taking into account the final Project design information and latest understanding of potential effects.

Loss of functionally linked land (construction)

10.6.3 It may be necessary to mitigate for the loss of the arable land within the temporary construction compound off Laporte Road if it is concluded to be functionally linked to the Humber Estuary.

10.6.4 The land lies within the Mitigation Zone to which Policy 9 of the Local Plan is applicable. This states that "…*proposals which adversely affect the Humber Estuary SPA/ Ramsar site due to the loss of functionally linked land will normally be required to provide their own mitigation in order to comply with the requirements of the Habitats Regulations*."

10.6.5 To ensure Habitats Regulations compliance for the Project, if the land is subsequently concluded to be functionally linked to the Humber Estuary SPA/ Ramsar, Policy 9 could be applied to the Project as embedded mitigation for the loss of land, and a payment made to contribute towards the South Humber Bank Strategic Mitigation Delivery Plan.

10.6.6 However, given that the land will only be lost temporarily for the duration of construction, the potential for alternative mitigation could be considered. Policy 9 states that "*On an exceptional basis independent alternative mitigation proposals will be considered on sites within the identified Mitigation Zone. Proposals should be supported by evidence that demonstrates that the alternative mitigation contributes to the overall mitigation strategy and ensures that the development avoids adverse effects on the integrity of the SPA/Ramsar site, alone or in combination*." Where proposed by the Applicant, further discussion with stakeholders would be undertaken as necessary.

Loss of breeding bird habitat within Long Strip woodland (construction)

10.6.7 As set out in Chapter 8 (Terrestrial Ecology), a compensation strategy for the loss of woodland (a UK Priority Habitat) will need to be agreed with the local planning authority to ensure compliance with Local Planning Policy 41, which states that the council will seek to "..*minimise the loss of biodiversity features, or where loss is unavoidable and justified ensure appropriate mitigation and compensation measures are provided..".*

10.6.8 Mitigation for loss of breeding bird habitats will be determined following the completion of further survey work in spring 2023 to identify the species present, and to evaluate the importance of the woodland to breeding birds.

10.7 Preliminary Assessment of Residual Effects

Construction

10.7.1 The following sections summarise the likely effects on ornithology receptors. Potential effects on the following receptors during construction were assessed as potentially significant:

a. Noise and visual disturbance on intertidal feeding and roosting during construction;

b. Loss of functionally linked land during construction; and

c. Loss of woodland supporting breeding non-SPA/ Ramsar birds.

10.7.2 Standard mitigation measures for noise/ visual disturbance including the use of soft start procedures, cold weather construction restrictions, seasonal working restrictions and the use of acoustic barriers and screening will be developed if required through ongoing engagement with statutory authorities.

10.7.3 The loss of functionally linked land would be mitigated either through a financial contribution to the South Humber Bank Strategic Mitigation Delivery Plan as set out in Policy 9 of the North East Local Plan, or an alternative mitigation strategy to be agreed with stakeholders.

10.7.4 With the implementation of appropriate mitigation measures, the residual effects on these receptors are considered likely to be **not significant** at this preliminary stage.

10.7.5 The permanent loss of woodland of this age and structure providing habitat for nesting birds could not be compensated over the short to medium term. Instead, compensation would require a timeframe longer than the proposed 25-year operational life of the terrestrial elements of the Project (excluding the jetty and jetty access road). So, the loss of breeding bird habitat would be permanent for the purposes of this assessment even with compensation. It is therefore assessed that the residual effect remains moderate adverse (**significant**).

10.7.6 All the other potential impacts on ornithology receptors have, at this preliminary stage, and based on the current project design, been assessed as **not significant**.

Operation

10.7.7 All potential impacts on ornithology receptors during operation have, at this preliminary stage, and based on the current project design, been assessed as **not significant**.

Decommissioning

10.7.8 The DCO Application would not make any provision for the decommissioning of the marine infrastructure above and below water level. This is because the development would, once constructed, become part of the fabric of the Immingham port estate and would, in simple terms, continue to be maintained so that it can be used for port related activities to meet a long-term need. On this basis, potential effects on ornithology receptors from decommissioning have been scoped out.

10.8 Summary of Preliminary Assessment

10.8.1 A summary of the impact pathways that have been assessed at this preliminary stage, together with the identified residual impacts and level of confidence is presented in **Table 10.10**.

Table 10.12: Summary of potential impact, mitigation measures and residual effects

Receptor	Impact pathway	Impact Significance	Mitigation Measure	Residual Effect	Confidence
Construction Phase					
Coastal waterbirds	Direct loss to intertidal feeding and roosting habitat as a result of the piles	Not significant	N/A	Not significant	Medium
	Direct loss of terrestrial habitats that are functionally linked to the Humber Estuary	Potentially significant	Contribution to South Humber Bank Strategic Mitigation Delivery Plan, or other alternative mitigation to be considered.	Not significant	High
	Indirect changes to intertidal foraging and roosting habitat as a result of changes to hydrodynamic and sedimentary processes	Not significant	N/A	Not significant	Low
	Airborne noise and visual disturbance to coastal waterbirds using intertidal habitats	Potentially significant	In order to reduce the level of potential impact associated with noise and visual disturbance during construction, a number of mitigation measures are being considered including the use of soft start procedures, cold weather construction restrictions, seasonal working restrictions and the use of acoustic barriers and screening.	Not significant	Medium

Receptor	Impact pathway	Impact Significance	Mitigation Measure	Residual Effect	Confidence
Breeding birds (non-SPA/ Ramsar)	Permanent loss of woodland habitat within Long Strip	Potentially significant	Compensation for loss of woodland to be agreed; like-for-like replacement would take longer to establish than the lifetime of this Project (which is anticipated to be 25 years for the operation of the terrestrial elements of the Project).	Potentially significant	Medium
Operational Phase					
Coastal waterbirds	Direct changes to foraging and roosting habitat as a result of the presence of infrastructure	Not significant	N/A	Not significant	Medium
	Airborne noise and visual disturbance to coastal waterbirds using intertidal habitats	Not significant	N/A	Not significant	Medium
	Airborne noise and visual disturbance to coastal waterbirds using terrestrial habitats	Not significant	N/A	Not significant	Medium

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10.10 Abbreviations and Glossary of Terms

Table 10.13: Glossary and Abbreviations

Term	Acronym	Definition
Appropriate Assessment	AA	The assessment of the impact on the integrity of a European site of a project or plan, either alone or in combination with other projects or plans, with respect to the site's structure and function and its conservation objectives.
Associated British Ports	ABP	One of the UK's leading and best-connected ports groups, owning and operating 21 ports and other transport-related businesses across England, Wales and Scotland.
Biodiversity Action Plan	BAP	A Biodiversity Action Plan is an internationally recognised program addressing threatened species and habitats and is designed to protect and restore biological systems.
Department for Business, Energy and Industrial Strategy	BEIS	The Government department responsible for policy and regulations on business, energy and industry issues.
Biodiversity Net Gain	BNG	An approach that aims to leave biodiversity within the natural environment in a measurably better state than its condition prior to implementation of a project.
British Trust for Ornithology	BTO	The British Trust for Ornithology is an organisation founded in 1932 for the study of birds in the British Isles.
Centre for Environment, Fisheries and Aquaculture Science	Cefas	The Centre for Environment, Fisheries and Aquaculture Science is an executive agency of the United Kingdom government Department for Environment, Food and Rural Affairs.
Chartered Institute of Ecology and Environmental Management	CIEEM	The leading professional membership body representing and supporting ecologists and environmental managers in the UK, Ireland and abroad.
Countryside and Rights of Way Act 2000	CRoW	The Countryside and Rights of Way Act gives greater freedom for people to explore open countryside as well as provisions designed to reform and improve rights of way in England and Wales. Additionally, the Act gives greater protection to wildlife and natural features by making provision for the conservation of biological diversity, and by improving protection for Sites of Special Scientific Interest in England and Wales and the enforcement of wildlife legislation as well as the introduction of provisions to allow the better management and protection of Areas of Outstanding Natural Beauty.

Term	Acronym	Definition
Diadromous species	D	Species using estuaries as pathways of migration (for reproduction) between fresh waters and the sea; migration from fresh water to sea water to breed (catadromous species, e.g. eel), and in the opposite direction (anadromous species, e.g., salmonids and lampreys)
Decibel	dB	The scale used to measure noise is the decibel scale which extends from 0 to 140 decibels, corresponding to the intensity of the sound pressure level.
Development Consent Order	DCO	The consent for a Nationally Significant Infrastructure Project required under the Planning Act 2008.
Department of Energy and Climate Change	DECC	-
Department for Environment, Food and Rural Affairs	Defra	-
Department for Transport	DfT	The Department for Transport is the United Kingdom government department responsible for the English transport network.
European Commission	EC	An executive branch of the European Union.
Ecological Impact Assessment	EcIA	The process of identifying, quantifying and evaluating the potential impacts of defined actions on ecosystems or their components.
European Economic Community	EEC	-
Environmental Impact Assessment	EIA	The statutory process through which the likely significant effects of a development project on the environment are identified and assessed.
European Marine Site	EMS	European Marine Sites are areas at sea, partly or completely covered by tidal water, which are protected by European law.
Environmental Statement	ES	A statutory document which reports the EIA process, produced in accordance with the EIA Directive as transposed into UK law by the EIA Regulations.
Estuarine resident Species	ES	Species that are able to reproduce and complete their life cycle in the estuary; as such they are highly euryhaline species, able to move throughout the full length of the estuary
European Union	EU	An economic and political union of 28 countries which operates an internal (or single) market which allows the

Term	Acronym	Definition
		free movement of goods, capital, services and people between member states.
Freshwater species	F	Species of freshwater origin that regularly or accidentally enter estuaries, in moderate to low numbers, moving varying distances down the estuary but often restricted to low-salinity, upper reaches of estuaries and to periods of freshwater flooding
Feature of Conservation Importance	FOCI	Features of Conservation Importance are marine features that are particularly threatened, rare, or declining species and habitats.
Great Britain	GB	-
Humber International Terminal	HIT	A terminal located within the Port of Immingham.
Heavily Modified Water Body	HMWB	Significant water bodies that have changed water category due to modifications.
Habitats Regulations Assessment	HRA	An assessment of projects (or plans) potentially affecting European Sites in the UK, required under the Habitats Directive and Regulations. Also known as an assessment of implications on European Sites
The Institute of Estuarine & Coastal Studies	IECS	The Institute of Estuarine & Coastal Studies (IECS) is a multi-disciplinary Environmental Research Consultancy with experience in the marine, coastal and estuarine environment.
Institute of Environmental Management and Assessment	IEMA	A professional body for practitioners working in the fields of environmental management and assessment.
International Maritime Organization	IMO	The International Maritime Organization is a specialised agency of the United Nations responsible for regulating shipping.
Invasive Non-native Species	INNS	Non-native UK plants that are invasive, for example Japanese Knotweed.
Immingham Outer Harbour	IOH	Immingham Outer Harbour is an area which partly makes up infrastructure located at the Port of Immingham.
Immingham Oil Terminal	IOT	An oil terminal operating out of the Port of Immingham.
Improvement Programme for England's Natura 2000 Sites	IPENS	A programme to develop a strategic approach to achieving favourable condition on these sites by reviewing: the risks and issues that are impacting on and/or threatening the condition of the site.

Term	Acronym	Definition
Joint Cetacean Protocol	JCP	This survey was undertaken to inform the identification of discrete and persistent areas of relatively high harbour porpoise density in the UK marine area.
In-combination Climate Change Impacts	JNCC	The JNCC are the public body that advises the UK Government and devolved administrations on UK-wide and international nature conservation.
Lincolnshire Ecological Records Centre	LERC	A statutory designation made under Section 21 of the National Parks and Access to the Countryside Act 1949 by principal local authorities.
Local Geological Sites	LGS	Non-statutory geological sites considered worthy of protection for their earth science or landscape importance. Formerly known as Regionally Important Geological Sites.
Local Nature Reserve	LNR	A statutory designation made under Section 21 of the National Parks and Access to the Countryside Act 1949 by principal local authorities.
Likely Significant Effect	LSE	Schedule 4 of the Regulations requires an environmental statement to include a description of the likely significant effects of the development on the environment.
Local Wildlife Site	LWS	Non-statutory sites of nature conservation value that have been designated 'locally'. These sites are referred to differently between counties with common terms including site of importance for nature conservation, county wildlife site, site of biological importance, site of local importance and sites of metropolitan importance.
Multi-Agency Geographic Information for the Countryside	MAGIC	A website which provides geographic information about the natural environment.
Marine Aggregate Levy Sustainability Fund	MALSF	The Levy was introduced as a means to better reflect the environmental costs of winning primary construction aggregates, and to encourage the use of alternative, secondary and recycled construction materials.
Marine and Coastal Access Act 2009	MCAA	The Act introduces a new system of marine management. This includes a new marine planning system, which makes provision for a statement of the Government's general policies, and the general policies of each of the devolved administrations, for the marine environment, and also for marine plans which will set out in more detail what is to happen in the different parts of the areas to which they relate

Term	Acronym	Definition
Marine Conservation Zone	MCZ	Marine Conservation Zones are areas that protect a range of nationally important, rare or threatened habitats and species
Mean High Water Springs	MHWS	The height of Mean Water High Springs is the average throughout the year, of two successive high waters, during a 24-hour period in each month when the range of the tide is at its greatest.
Marine Migrant species	MM	Marine species that spawn at sea and regularly enter estuaries in large numbers, thus having a temporary residence in the estuarine habitat; they usually are highly euryhaline species, able to move throughout the full length of the estuary, and spending much of their life within estuaries, using these habitats as nursery grounds or visiting them regularly at sub-adult and adult life stages.
Marine Management Organisation	MMO	The Marine Management Organisation is an executive non-departmental public body in the United Kingdom established under the Marine and Coastal Access Act 2009, with responsibility for English waters.
Marine Policy Statement	MPS	The UK Marine Policy Statement provides the framework for preparing Marine Plans and is key when making decisions directly affecting the marine environment.
Marine Straggler species	MS	A category of fish that enter estuaries infrequently and usually in low numbers,
National Biodiversity Network	NBN	A collaborative venture in the United Kingdom, which facilitates access to biodiversity information.
Nationally Significant Infrastructure Project	NSIP	A type of project listed in the Planning Act 2008, which must be consented by a Development Consent Order.
Natural England	NE	Executive non-departmental public body constituted under the Natural Environment and Rural Communities Act 2006 (section 2(1)) to ensure that the natural environment is conserved, enhanced and managed for the benefit of present and future generations, thereby contributing to sustainable development.
Natural Environment and Rural Communities	NERC	The act created Natural England and the Commission for Rural Communities and, amongst other measures, it extended the biodiversity duty set out in the Countryside and Rights of Way Act to public bodies and statutory undertakers to ensure due regard to the conservation of biodiversity.

Term	Acronym	Definition
National Policy Statement for Ports	NPSfP	The National Policy Statement for Ports provides the framework for decisions on proposals for new port development.
Permanent Threshold Shift	PTS	A permanent reduction of the sensitivity of the ear, decreasing the ability of the ear to detect sound.
Planning Act 2008	PA	An Act of Parliament in the UK intended to speed up the process of approving major new infrastructure projects.
Polycyclic Aromatic Hydrocarbons	PAH	A polycyclic aromatic hydrocarbon is a chemical compound containing only carbon and hydrogen that is
Preliminary Environmental Information Report	PEI Report	A report that compiles and presents the Preliminary Environmental Information gathered for a project.
Planning Inspectorate	PINS	An executive agency with responsibilities for planning appeals, national infrastructure planning applications, local plan examinations and other planning-related casework in England and Wales.
Particle Size Analysis	PSA	Particle size analysis is used to characterise the size distribution of particles in a given sample.
Wetlands of international importance, designated under The Convention on Wetlands (Ramsar, Iran, 1971)	Ramsar	Wetlands of international importance designated under the Ramsar Convention
Regional Environmental Characterisation	REC	A regional assessment of the geology, ecology and archaeology of the seafloor using information gathered through desk based assessment, geophysical data and sampling surveys.
Roll On-Roll Off	Ro-Ro	A design to allow vehicles to drive on and drive off ships.
Royal Society for the Protection of Birds	RSPB	Nature conservation charity for the protection of birds.
Special Area of Conservation	SAC	Sites designated under EU legislation for the protection of habitats and species considered to be of European interest.
Small Cetaceans in European Atlantic Waters and the North Sea	SCANS	A series of large-scale surveys for cetaceans in European Atlantic waters was initiated in 1994 and continued in 2005 and 2007 with the purpose of providing estimates of abundance needed to put bycatch in a population context and to allow EU member States to discharge their responsibilities under the Habitats Directive.

Term	Acronym	Definition
Special Committee on Seals	SCOS	Sites designated under the European Directive on the Conservation of Wild Birds for the protection of birds in member states.
Sea Mammal Research Unit	SMRU	The parameter by which sound levels are measured in air. It is measured in decibels. The threshold of hearing has been set at 0dB, while the threshold of pain is approximately 120dB. Normal speech is approximately 60dB at a distance of 1 metre and a change of 3dB in a time varying sound signal is commonly regarded as being just detectable. A change of 10dB is subjectively twice, or half, as loud.
Special Protection Area	SPA	Sites designated under the European Directive on the Conservation of Wild Birds for the protection of birds in member states.
Sound Pressure Levels	SPL	The parameter by which sound levels are measured in air. It is measured in decibels. The threshold of hearing has been set at 0dB, while the threshold of pain is approximately 120dB. Normal speech is approximately 60dB at a distance of 1 metre and a change of 3dB in a time varying sound signal is commonly regarded as being just detectable. A change of 10dB is subjectively twice, or half, as loud.
Suspended Sediment Concentrations	SSC	Suspended sediment concentration is the total value of both mineral and organic material carried in suspension by a river.
Site of Special Scientific Interest	SSSI	Area of land notified by Natural England under section 28 of the Wildlife and Countryside Act 1981 as being of special interest due to its flora, fauna or geological or physiological features
Total Organic Carbon	TOC	Total Organic Carbon (TOC) is a measure of the total amount of carbon in organic compounds in pure water and aqueous systems.
Transitional and Coastal Waters	TraC	The transitional zone of water between river and sea.
Trailer Suction Hopper Dredger	TSHD	Trailer suction hopper dredgers are oceangoing vessels that can collect sand and silt from the seabed and transport it over large distances.
Temporary Threshold Shift	TTS	A noise-induced threshold shift that fully recovers over time.
United Kingdom	UK	-

Term	Acronym	Definition
Wildlife and Countryside Act 1981	WCA	This legislation protects various animals, plants, habitats in the UK.
Wetland Bird Survey	WeBS	The Wetland Bird Survey monitors non-breeding waterbirds in the UK.
Water Framework Directive	WFD	A European Union Directive which commits member states to achieve good status of all waterbodies (both surface and groundwater), and also requires that no such waterbodies experience deterioration in status. Good status is a function of good ecological and good chemical status, defined by a number of elements.