## CONTENTS



## TABLES

# 10.0 ECOLOGY

## 10.1 Introduction

10.1.1 This chapter of the Environmental Statement (ES) addresses the potential effects of the Proposed Development on ecology features.

10.1.2 The ecological impact assessment (EcIA) presented within this chapter of the ES considers:

- the present-day and future baseline conditions at the Site;
- the predicted temporary effects of construction of the Proposed Development on habitats and species, with respect to construction traffic, construction dust and the Proposed Development;
- the predicted permanent/ long-term effects of the operation and maintenance of the Proposed Development on habitats and species; and
- the potential effects of decommissioning of the Proposed Development on habitats and species.

10.1.3 This chapter is supported by the following technical appendices, provided in ES Volume III (Document Ref. 6.4):

- Appendix 10A – Planning Policy and Legislation;
- Appendix 10B – Ecological Impact Assessment Method;
- Appendix 10C – Preliminary Ecological Assessment (PEA);
- Appendix 10D – Aquatic Invertebrate Survey;
- Appendix 10E – Otter and Water Vole Survey;
- Appendix 10F – Reptile Survey; and by the

10.1.4 A Habitats Regulations Assessment (HRA) Signposting Report has also been prepared to accompany the Development Consent Order (DCO) application (Document Ref. 5.8).

## 10.2 Legislation and Planning Policy Context

10.2.1 This EcIA has been undertaken within the context of relevant planning policies, guidance documents and legislative instruments. A summary of these is provided below, and further details are included in Appendix 10A, ES Volume III (Document Ref. 6.4).

Legislative Background

10.2.2 The following legislation is considered relevant to the Proposed Development:

- Wildlife and Countryside Act (WCA) 1981 (as amended);
- Countryside and Rights of Way (CRoW) Act 2000 (as amended);
- Natural Environment and Rural Communities (NERC) Act 2006 (as amended);

- The Conservation of Habitats and Species Regulations 2017 (as amended) (the Habitats Regulations);
- Protection of Badgers Act 1992 (as amended);
- The Water Environment (Water Framework Directive) (England and Wales) Regulations 2017 (WFD);
- Animal Welfare Act 2006; and
- The Environment Bill (if enacted and brought into force).

National Planning Policy

10.2.3 The overarching National Policy Statement (NPS) for Energy (EN-1) (Department for Energy and Climate Change (DECC), 2011) sets out national policy for energy infrastructure. Part 5.3 relates to biodiversity and states that where development is subject to Environmental Impact Assessment (EIA), the ES should clearly set out the effects on internationally, nationally and locally designated nature conservation sites, on protected species and on habitats and other species identified as being of principal importance for the conservation of biodiversity. It also requires that the applicant shows how the project has taken advantage of opportunities to conserve and enhance biodiversity, and states that as a general principle developments should aim to avoid significant harm to biodiversity conservation interest, including through mitigation and consideration of alternatives.

10.2.4 The UK Government has committed to halting the overall decline in biodiversity. Planning policy support for this is set out in the National Planning Policy Framework (NPPF) published by the Ministry for Housing, Communities and Local Government in February 2019. While the NPPF does not directly apply to nationally significant infrastructure projects (NSIPs), such as the Proposed Development, it may be a relevant factor in their determination. The forthcoming Environment Bill will mandate biodiversity net gain for development carried out pursuant to a planning permission but NSIPs are not within the scope of the provisions in the Bill for biodiversity net gain.

10.2.5 The NPPF states the commitment of the UK Government to minimising impacts on biodiversity and providing net gains in biodiversity where possible, contributing to the Government's commitment to halt the overall decline in biodiversity. It specifies the obligations that Local Authorities and the UK Government have regarding statutory designated sites and protected species under UK and international legislation, and how this is to be delivered in the planning system. Protected or notable habitats and species can be a material consideration in planning decisions and may therefore make some sites unsuitable for particular types of development, or if development is permitted, mitigation measures may be required to avoid or minimise impacts on certain habitats and species, or where an impact is unavoidable, compensation may be required.

Local Development Plan Policy

10.2.6 Local planning policy relevant to ecology and nature conservation is set out in the North East Lincolnshire Local Plan, which was adopted by North East

Lincolnshire Council (NELC) in 2018 and sets out a long-term vision for managing growth and development in the area up to 2032.

10.2.7 Policy 41 (Biodiversity and Geodiversity) relates to the protection of statutory and non-statutory designated sites, biodiversity features and the borough's ecological network.

10.2.8 Policy 9 (Habitat Mitigation – South Humber Bank) sets out the approach to delivering mitigation within the Local Plan area for the loss of wintering bird habitat that is functionally linked to the Humber Estuary internationally designated site. Within the Mitigation Zone identified on the policies map, development proposals on greenfield land that adversely affect the Humber Estuary Special Protection area (SPA)/ Ramsar site due to the loss of functionally linked land will be required to make contributions towards the provision and management of the mitigation sites identified. This is secured on a proportional approach relating to the site area. The Proposed Development lies within the Mitigation Zone, and therefore this policy will apply to the delivery of mitigation for wintering birds. The habitat mitigation contribution for the Consented Development was secured by a Section 106 agreement, and these provisions will carry over to the Proposed Development via a deed of variation. The quantum of the contribution will not change between the Consented Development and the Proposed Development, since the area of land potentially used by wintering birds and which will be lost is the same in each case.

Other Guidance

10.2.9 In July 2012, the UK Post-2010 Biodiversity Framework was published by the Joint Nature Conservation Committee and the Department for the Environment, Food and Rural Affairs (Defra). This covers the period from 2011 to 2020 and forms the UK Government's response to the UN Convention on Biological Diversity held in Nagoya in 2010. Following publication of the Framework, most of the strategic biodiversity work previously enacted under the UK Biodiversity Action Plan was delegated to each of the four countries comprising the United Kingdom of Great Britain and Northern Ireland. The Framework shows how the work of the four UK countries joins up to achieve the international biodiversity targets agreed under the UN Convention, as well those required under the European Union biodiversity strategy.

10.2.10 In England, the strategic approach to be taken in biodiversity planning over the period from 2010 to 2020 is set out in '*Biodiversity 2020, A strategy for England's wildlife and ecosystem services*' (Defra, 2011). These country strategies replace the UK Biodiversity Action Plan, with the associated lists of priority habitats and species carried over into the newly defined lists of habitats and species of principal importance for nature conservation in England listed pursuant to Section 41 of the NERC Act. This latter list encompasses 56 habitats and 943 species.

10.2.11 The Local Biodiversity Action Plan (BAP) for Lincolnshire is a nature conservation strategy identifying threats to habitats and species within the county and setting out the actions necessary to conserve them through a series of Habitat Action Plans (HAPs) and Species Action Plans (SAPs).

10.2.12 Standing advice has been published by Natural England and Defra to guide decision-makers on the determination of proposals with the potential to affect designated sites, species and habitats. The guidance sets out responsibilities and minimum requirements for survey and mitigation.

## 10.3 Assessment Methodology

10.3.1 The EcIA presented in this chapter has been undertaken in accordance with best practice guidance issued by the Chartered Institute of Ecology and Environmental Management (CIEEM) (CIEEM, 2019). Full details of the approach applied are provided in Appendix 10B: Ecological Impact Assessment Methodology in ES Volume III (Document Ref. 6.4) with an abridged overview provided below. The aims of the EcIA are to:

- identify relevant ecological features (i.e. designated sites, habitats, species or ecosystems) which may be impacted as a consequence of the Proposed Development;
- provide a robust assessment of the likely ecological impacts and resultant effects of the Proposed Development, which may be beneficial (i.e. positive) or adverse (i.e. negative);
- facilitate determination of the consequences of the Proposed Development in terms of national, regional and local policies relevant to nature conservation and biodiversity, where the level of detail provided is proportionate to the scale of the development and the complexity of its potential impacts; and
- set out the steps to be taken to adhere to legal requirements relating to the relevant ecological features concerned.

10.3.2 It is not necessary in the assessment to address all habitats and species with potential to occur in the zone of influence of a proposed development. Instead, the focus should be on those that are 'relevant'. CIEEM guidance makes it clear that there is no need to "*carry out detailed assessment of ecological features that are sufficiently widespread, unthreatened and resilient to project impacts and will remain viable and sustainable*". This does not mean that efforts should not be made to safeguard wider biodiversity and requirements for this have been considered.

10.3.3 To support a focussed EcIA, there is a need to determine the scale at which the ecological features identified through the desk studies and field surveys undertaken for the Proposed Development are of value. The value of each ecological feature has been defined with reference to the geographical level at which it matters, and the results of this assessment have been used to identify the relevant features requiring impact assessment. The frames of reference used for this assessment, based on CIEEM guidance, are:

- International (generally this is within a European context, reflecting the general availability of good data to allow cross-comparison);
- National (Great Britain, but considering the potential for certain ecological features to be more notable (of higher value) in an England context relative to Great Britain as a whole);

- Regional (South Humberside);
- County (Lincolnshire);
- District (Stallingborough parish);
- Local or Site (ecological features that do not meet criteria for valuation at a District or higher level, but that have sufficient value to merit retention or mitigation); and
- Negligible (common and widespread ecological features of such low priority that they do not require retention or mitigation at the relevant location to otherwise maintain a favourable nature conservation status).

10.3.4 All ecological features of Local value and above have been taken forward to impact assessment, and are the 'relevant ecological features' for the purposes of impact assessment.

10.3.5 In line with the CIEEM guidelines, the terminology used within the EcIA draws a clear distinction between the terms 'impact' and 'effect'. For the purposes of the EcIA, these terms are defined as follows:

- impact – actions resulting in changes to an ecological feature; for example, demolition activities leading to the removal of a building utilised as a bat roost; and
- effect – outcome resulting from an impact, acting upon the conservation status or structure and function of an ecological feature; for example, killing/ injury of bats and reducing the availability of breeding habitat as a result of the loss of a bat roost may lead to an adverse effect on the conservation status of the population concerned.

Significance Criteria

10.3.6 For each ecological feature only those characteristics relevant to understanding the ecological effect and determining the significance are described. The determination of the significance of effects has been made based on the predicted effect on the structure and function, or conservation status, of relevant ecological features, as follows:

- not significant - no effect on structure and function, or conservation status; and
- significant - structure and function, or conservation status is affected.

10.3.7 For significant effects (both adverse and beneficial) this is qualified with reference to the geographic scale at which the effect is significant (e.g. an adverse effect significant at a national level).

10.3.8 The CIEEM approach described in Appendix 10B: Ecological Impact Assessment Method in ES Volume III (Document Ref. 6.4) broadly accords with the EIA methodology described in Chapter 2: Assessment Methodology of this ES. However, the matrix has not been used to classify predicted effects, as this deviates from CIEEM guidance. In order to provide consistency of terminology in the final assessment, the findings of the CIEEM assessment have been translated into the classification of effects scale used in other chapters of the ES as outlined in Table 10.1 below.

**Table 10.1: Relating CIEEM assessment terms to those used in other ES chapters**

| EFFECT CLASSIFICATION | TERMINOLOGY USED IN OTHER ES CHAPTERS | EQUIVALENT CIEEM ASSESSMENT |
|---|---|---|
| Significant (beneficial) | Major beneficial | Beneficial effect on structure/ function or conservation status at regional, national or international level. |
| | Moderate beneficial | Beneficial effect on structure/ function or conservation status at District or County level. |
| Non-significant | Minor beneficial | Beneficial effect on structure/ function or conservation status at Site or Local level. |
| | Neutral | No effect on structure/ function or conservation status. |
| | Minor adverse | Adverse effect on structure/ function or conservation status at Site or Local level. |
| Significant (adverse) | Moderate adverse | Adverse effect on structure/ function or conservation status at District or County level. |
| | Major adverse | Adverse effect on structure/ function or conservation status at Regional, National or International level. |

Survey Methods and Scope

*Extent of Study Area*

10.3.9 The study areas used in this assessment were defined with reference to the likely zone of influence over which the Proposed Development may have potential to result in significant effects on relevant ecological features.

10.3.10 It is important to recognise that the potential zone of influence of the Proposed Development may vary over time (e.g. the construction zone of influence may differ from the operational zone of influence) and/ or depending on the individual sensitivities of different ecological features.

10.3.11 This was taken into account when defining study areas and these are sufficient to address the potential worst case zone of influence of the Proposed Development on the relevant ecological features concerned.

10.3.12 The extent of the study areas applied during the desk study and field surveys are detailed within Table 10.2 and Table 10.3 below, and in Figures 10C.2 and 10C.3 in Appendix 10C in ES Volume III (Document Ref. 6.4).

*Desk Study*

10.3.13 A desk study was carried out to identify nature conservation designations and protected and notable habitats and species potentially relevant to the Proposed Development. The desk study was carried out using the data sources detailed in Table 10.3 and is reported in detail in the Preliminary Ecological Appraisal (PEA) report in Appendix 10C in ES Volume III (Document Ref. 6.4).

10.3.14 Protected and notable habitats and species include those listed under Schedules 1, 5 and 8 of the WCA, Schedules 2 and 4 of The Habitats Regulations, and species and habitats of principal importance for nature conservation in England listed pursuant to Section 41 of the NERC Act. Other notable habitats and species have also been considered and assessed on a case by case basis (e.g. those included in national Red Data Books and Lists and within the Lincolnshire BAP, but not protected by legislation). This is consistent with the requirements of relevant planning policy.

**Table 10.2: Desk study area and data sources**

| ECOLOGY FEATURE | STUDY AREA | SURVEY METHOD | DATE ACCESSED |
|---|---|---|---|
| International statutory nature conservation designations | 10 km | Multi-Agency Geographic Information for the Countryside (MAGIC) website | March 2020 |
| National statutory nature conservation designations | 2 km | MAGIC website<br>Natural England website | March 2020 |
| Local non-statutory nature conservation designations | 2 km | Greater Lincolnshire Nature Partnership | March 2020 |
| Protected and notable habitats and species | 1 km | Greater Lincolnshire Nature Partnership<br>Ecological Assessment of Centrica South | March 2020 |

| ECOLOGY FEATURE | STUDY AREA | SURVEY METHOD | DATE ACCESSED |
|---|---|---|---|
| | | Humber Bank Power Station (Humber INCA, 2010)<br>Centrica South Humber Bank Biodiversity Action Plan (Humber INCA, 2011)<br>Lincolnshire BAP (Lincolnshire Biodiversity Partnership, 2011) | |
| Ponds | 250 m | 1:25,000 Ordnance Survey maps<br>Aerial photographs (Google Earth)<br>MAGIC website | March 2020 |
| Wintering birds | Site and surrounding fields (Fields 30, 31, 37 & 39[1]) | Humber Environmental Data Centre | March 2020 |

*Field Surveys*

10.3.15 The scope of habitat and protected species survey work considered necessary to inform this EcIA is summarised in Table 10.3. This was determined through a PEA of the Site, as detailed within Appendix 10C: PEA Report in ES Volume III (Document Ref. 6.4) ,which also includes the rationale applied when scoping out surveys for certain species or species groups.

10.3.16 The Phase 1 Habitat survey area encompassed all habitats within the Main Development Area (green line boundary on the Phase 1 Habitat map) and the Wider Survey Area (red line boundary on the Phase 1 Habitat map) (the Site).

10.3.17 In addition to the surveys undertaken by AECOM, a survey of the Site was previously undertaken by Humber INCA in 2010 and included a Phase 1 Habitat survey and water vole survey (Humber INCA, 2010).

[1] Field numbering refers to codes used to identify fields subject to survey as part of the Humber Environmental Data Centre's wintering bird survey programme. The Proposed Development is within Field 39.

**Table 10.3: Scope and methods of ecological field survey work**

| ECOLOGY SURVEY | STUDY AREA | SURVEY METHOD | TIMING |
|---|---|---|---|
| Phase 1 Habitat survey | Habitats within the Main Development Area and Wider Survey Area. | Habitats mapped in accordance with Joint Nature Conservancy Council (JNCC), 2010. | May 2018 and October 2019 |
| Reptiles | Suitable habitat for reptiles within and adjacent to the Main Development Area. | Seven visits in suitable weather conditions using artificial refuges in accordance with standard guidance. | July and Sept 2018 |
| Aquatic invertebrates | Suitable ditches within the Main Development Area. | Sampling in accordance with Buglife guidance (Palmer et al., 2013). | June and Sept 2018 |
| Water vole | Suitable ditches within the Main Development Area and Wider Survey Area. | Single visit to survey all banks of ditches. | 3rd October 2018 and 16th October 2019 |
| Otter | Suitable ditches within the Main Development Area and Wider Survey Area. | Single visit to survey all banks of ditches. | 3rd October 2018 and 16th October 2019 |

*Wintering Bird Surveys*

10.3.18 Surveys of the Main Development Area for wintering birds were not undertaken because the Applicant has committed to providing mitigation for the loss of high tide roosting/ loafing and foraging habitat that is functionally linked to the Humber Estuary SPA/ Ramsar via the South Humber Gateway (SHG) strategic mitigation scheme covered by Policy 9 of the Local Plan. This approach was agreed with Natural England through its Discretionary Advice Service (DAS) for the Consented Development EIA.

10.3.19 The area of habitat to be drawn down from the SHG strategic mitigation scheme at Cress Marsh, to the south of the Site, has been determined with reference to the wintering bird surveys conducted at the time the SHG scheme was developed in winter 2010/11. The Cress Marsh habitat mitigation site has been constructed

and is now functioning. Further wintering bird surveys of the Site are therefore not necessary to inform this calculation.

*Surveys Scoped Out*

10.3.20 The following protected species surveys were scoped out primarily on the basis of habitat unsuitability following completion of the PEA (further justification is provided in the PEA in Appendix 10C in ES Volume III (Document Ref. 6.4):

- wintering birds – see rationale above;
- breeding birds – the Main Development Area does not have the potential to support important assemblages of nesting birds but habitats within the Main Development Area provide limited nesting opportunities for a range of bird species. Desk study results revealed limited records of breeding birds in the wider area and species such as curlew and lapwing are unlikely to use the enclosed landscape character of the Site. Requirements for mitigation for legislative compliance only are considered in this chapter;
- bats (roosting) – there is no habitat suitable for roosting bats within or adjacent to the Main Development Area. Roosting bats are therefore not considered further in this EcIA;
- bats (foraging/ commuting) – habitats present within the Main Development Area are of limited value (lack of linear features, largely grassland) to foraging/ commuting bats, as they are likely to be open and exposed due to their proximity to the banks of the Estuary. Foraging and commuting bats are therefore not considered further in this EcIA;
- [redacted] – [redacted] within the Site or Main Development Area were found during the Phase 1 Habitat surveys/ protected species surveys undertaken in 2018 and most recently in October 2019. A pre-construction ecological walkover survey will be completed if the start of construction is delayed beyond the earliest construction programme scenario set out in Chapter 5: Construction Programme and Management. [redacted] further in this EcIA;
- great crested newt (GCN) – there are no ponds within the Main Development Area or within 250 m of the Main Development Area. Great crested newt is not considered further in this EcIA. However due the presence of a potential hibernacula and ditches with standing water during times of no flow, there is potential for newts to be in the wider area, so a watching brief will be carried out during the ground clearance of the Main Development Area; and
- water shrew (*Neomys fodiens*) – this species was incidentally recorded during the reptile surveys within the Main Development Area and may be present in the surrounding habitats. However, this species is widespread and common and is not considered an important feature for the purposes of EcIA. Requirements for mitigation for legislative compliance only are considered in this chapter.

Assessment Scenarios and Parameters

10.3.21 As described in Chapter 4: The Proposed Development and Chapter 5: Construction Programme and Management, there are three possible construction programme scenarios. For the purposes of the EcIA there is no significant difference in impacts between the three scenarios, and the construction assessment presented would apply to all.

10.3.22 For the purposes of the EcIA it is assumed that the majority of the Main Development Area would be cleared for construction and the Proposed Development would be built out to the maximum dimensions (i.e. the maximum Rochdale Envelope parameters for the Proposed Development as set out in Chapter 4: The Proposed Development). As such a worse case has been assessed in terms of impacts on ecological features within the Site.

Consultation

10.3.23 Comments relevant to the EcIA were provided by Natural England and the Marine Management Organisation and summarised in the NELC Scoping Opinion for the Consented Development as follows:

> "*The location of the proposal close to the Humber Estuary means that the provisions of the Wildlife and Countryside Act 1981 (as amended) and the Habitats Regulations 2010 will apply. Any assessment will need to consider potential impacts of the development close to the designated sites on all of the features of the SSSI, SPA, Ramsar and SAC. SPA Bird species will need to be considered. Moreover consideration will need to be given to Breeding Birds and Protected Species. It is acknowledged that you have undertaken consultation with Natural England and their response is dated 27th July 2018. You are also advised to consider the comments of the Marine Management Organisation dated 13th July 2018.*"

10.3.24 The assessment presented within this chapter considers impacts on the designated sites, breeding birds and protected species as required. The comments from the Marine Management Organisation (MMO) (as referenced within the quote at paragraph 10.3.23 above) do not apply as they relate to any works below the Mean High Water level which may require a licence or consent from the MMO (of which none are required).

10.3.25 An EIA Scoping Opinion was received from the Planning Inspectorate on 02 October 2019 (see Appendix 1B in ES Volume III, Document Ref. 6.4). The consultation response received from NELC outlined that the EIA Scoping Report for the Proposed Development captured the relevant information requested by NELC at the time of scoping the EIA for the Consented Development and that NELC had no further comments to make in respect of the Proposed Development.

10.3.26 Comments from other stakeholders in the PINS Scoping Opinion in relation to the EcIA scope are shown in Table 10.4 below.

**Table 10.4: Stakeholder comments from the PINS Scoping Opinion**

| SURVEY | COMMENT | RESPONSE |
|---|---|---|
| Phase 2 botanical survey | It is noted that the Phase 1 habitat survey already carried out provides a detailed species list which will be updated in September 2019. The Inspectorate therefore agrees that further botanical surveys can be scoped out. | This is noted. |
| Wintering birds | The Scoping Report states that there is already sufficient data on bird usage of the affected fields and further surveys would add little new information. In addition, this approach was agreed with Natural England during consultation on the EIA for the extant planning permission. The Inspectorate agrees that further surveys can be scoped out, provided the ES contains sufficient information on the wintering bird populations to allow an assessment of likely significant effects. | This is noted. |
| Breeding birds | The Scoping Report states that there is little suitable habitat available on the site which could support breeding bird populations. However, there is little supporting evidence in the Scoping Report. The Inspectorate does not agree to this matter being scoped out and an assessment of any likely significant effects associated with this matter should be included in the ES. | As stated at paragraph 10.3.20 above, the Main Development Area does not have the potential to support important assemblages of nesting birds. However habitats within the Main Development Area provide limited nesting opportunities for a range of bird species so mitigation requirements legislative compliance are considered in this chapter. |
| [redacted] | The Scoping Report states that there is [redacted] available on the site which could [redacted]. However, there is little | As described at paragraph 10.3.20 above [redacted] |

| SURVEY | COMMENT | RESPONSE |
|---|---|---|
| | supporting evidence in the Scoping Report to support this statement. The Inspectorate does not agree to this matter being scoped out unless the ES can provide evidence which supports the position that [redacted] | Development Area were found during the Phase 1 Habitat survey undertaken in 2018, during subsequent surveys for other protected species in 2018, and during the update Phase 1 Habitat survey in 2019. A pre-construction ecological walkover survey will be completed if the start of construction is delayed beyond the earliest construction programme scenario set out in Chapter 5: Construction Programme and Management. |
| Study areas | The ES should explain how the study areas used for the different ecological receptors relates to the zone of influence of the Proposed Development. | The rationale for the Study Area is set out above in paragraphs 10.3.9 to 10.3.12. |
| Potential impacts on ecological features | The list of potential impacts does not appear to include effects associated with decommissioning, operational effects on aquatic habitats and water quality in the surrounding ditches, and temporary air quality effects resulting from plant and vehicle movements during construction. The ES should assess the effects resulting from these impacts where a likely significant environmental effect would occur. | Decommissioning effects are assessed in paragraphs 10.6.91 – 10.6.92.<br>Operational effects on aquatic habitats are considered in paragraphs 10.6.70 – 10.6.71 (Humber Estuary), paragraph 10.6.84 – 10.6.85 (ditches), paragraph 10.6.87 - 10.6.88 (water vole habitat) and paragraph 10.6.89 - 10.6.90 (otter).<br>Water quality impacts are also assessed in Chapter 14: Water Resources, Flood Risk and Drainage.<br>The air quality assessment presented in Chapter 7: Air Quality concludes that construction traffic and plant emissions will have imperceptible or very low |

| SURVEY | COMMENT | RESPONSE |
|---|---|---|
| | | impacts and no significant effects, so this topic is not discussed further in this chapter. |
| Update of the ecological impact assessment for the Consented Development | The updated ecological impact assessment must take account of the additional generating capacity and its associated effects. The Applicant is advised to agree the scope of the assessment of effects on the Humber Estuary Special Protection Area/ Ramsar/ Site of Special Scientific Interest with Natural England. | The Applicant has consulted with Natural England regarding the information to support a Habitat Regulations Assessment for the Proposed Development. |

10.3.27 A response to consultation on the Preliminary Environmental Information (PEI) Report in accordance with Section 42 of the Planning Act 2008 was provided by Natural England (dated 13 December 2019). This is summarised in Table 10.5 below. The only other Section 42 consultee which made comments on Ecology was from North Lincolnshire Council who stated,

> "*The competent authority will need to carry out a Habitats Regulations Assessment of this project, alone and in combination with other plans or projects. The Humber Nature Partnership maintains a database of in-combination plans and projects around the Humber Estuary that may be useful. Having reviewed Chapter 10 of the PEIR and the comments supplied by the council's ecologist I can confirm that the proposed approach to the Habitats Regulations Assessment appears to be acceptable; as does the proposed approach in respect of protected and priority species. Furthermore, North Lincolnshire Council supports the proposal to contribute towards strategic mitigation for SPA/Ramsar waterbirds"*.

10.3.28 These comments were noted however no updates have been required to the assessment in light of this response.

**Table 10.5: Natural England Section 42 consultation comments**

| PARAMETER | COMMENT | RESPONSE |
|---|---|---|
| Functionally linked land | This development proposal falls within the South Humber Bank mitigation zone, the applicant has stated that they wish to contribute to this approach and Natural England welcomes this position. The applicant should further liaise with the Council | The financial contribution to NELC will be secured by Section 106 agreement, as outlined at paragraphs 10.5.3 and 10.5.4 below. |

| PARAMETER | COMMENT | RESPONSE |
|---|---|---|
| | regarding how to contribute to the strategic approach. | |
| Noise and visual disturbance | Natural England notes that it has been determined that a Likely Significant Effect cannot be ruled out for potential noise disturbance from piling activity to SPA/ Ramsar bird species that use neighbouring land that is functionally linked to the Humber Estuary designated sites. Two mitigation options have been proposed: either seasonal piling restrictions or the use of Continuous Flight Auger piling. If the latter is chosen, then further details may be required to demonstrate that the use of CFA piling itself would not have a Likely Significant Effect on the designated sites. | Noted. Both piling noise mitigation options are deemed appropriate, and are described in Section 10.7. Since the PEI Report further detail on impacts from Continuous Flight Auger (CFA) piling are assessed in Chapter 8: Noise and Vibration and effects on birds at functionally linked fields are assessed at paragraphs 10.6.15, 10.6.23 and 10.6.28.<br>As described at paragraph 10.7.3, CFA piling is one of the quietest forms of piling. |
| Noise and visual disturbance | Natural England welcomes the proposed measure to mitigate visual disturbance from vehicle and personnel movements by installing a 2.5 m high close-boarded fence along part of the southern boundary of the site. | Noted. See Section 10.7 and Figure 4.2 (ES Volume II, Document Ref. 6.3) for information on this mitigation measure. |
| Noise and visual disturbance | Natural England welcomes the recognition of lighting impacts and the statements that "*Construction temporary lighting would be arranged so that glare is minimised outside the construction site. Measures to minimise the impact of lighting will be detailed in the CEMP*" and "*Lighting impacts beyond the Site boundary will be minimised as far as possible, for example by directing lighting away from adjacent habitats, in accordance with the lighting design for the scheme*". Natural England recommends that this | As described at paragraphs 10.5.11 and 10.5.13, construction and operational light impacts will be controlled by design. An Indicative Lighting Strategy is provided as Document Ref. 5.12, and lighting impacts are considered in the HRA Signposting Document (Document Ref. 5.8). |

| PARAMETER | COMMENT | RESPONSE |
|---|---|---|
| | information is included within the HRA. | |
| Air quality | Natural England notes that the in-combination assessment for air quality is being updated and therefore would welcome this information when it becomes available. | The updated in-combination effects assessment for air quality is reported in Appendix 7A (ES Volume III, Document Ref. 6.4), Chapter 17: Cumulative and Combined Effects and in the HRA Signposting Document (Document Ref 5.8). |
| Water quality and drainage | We note that surface water quality and drainage into the Humber Estuary has been discussed within the HRA as a potential impact pathway and welcome the commitment to maintain the greenfield run off rates and endorse pollution prevention best practice. However, there is no discussion of potential impacts from foul drainage into the Humber Estuary. It appears that the foul drainage strategy has yet to be decided, and therefore depending on the design further consideration may be required if there is discharge into the European sites or if a septic tank is installed with a soakaway, consideration should be made as to the location of the soakaway. | The foul drainage options are set out in Chapter 4: The Proposed Development and in the Outline Drainage Strategy at Appendix 14B (ES Volume III, Document Ref. 6.4). Foul drainage is likely to be processed via an on-site package treatment plant that discharges to one of the surface water ditches within the Main Development Area, and will ultimately discharge to the Humber Estuary. No impacts on water quality within the receiving ditches or the Humber Estuary are predicted (see Chapter 14: Water Resources, Flood Risk and Drainage) and as such there is no potential adverse operational effect on the ditch habitats and the protected species they support (water vole) (see paragraph 10.5.16 below), or the Humber Estuary. |

| PARAMETER | COMMENT | RESPONSE |
|---|---|---|
| Protected species | Natural England note the suite of ecological field surveys that have been undertaken as detailed in Table 10.3 of the Preliminary Environmental Information Report and welcome the proposed avoidance/ mitigation measures and pre-construction checks as set out in Sections 10.5 and 10.7 of the report and the creation of an Ecological Management and Enhancement Plan (EMEP). | Development design and impact avoidance measures are set out at Section 10.5 below.<br>Biodiversity mitigation and enhancement measures are set out at Section 10.7 below.<br>Both are also detailed in the Biodiversity Protection Plan contained within the Biodiversity Strategy (Document Ref. 5.11). |
| Environmental and Biodiversity Enhancement | Natural England welcomes the creation of the EMEP and note that this includes mitigation for impacts on water vole, grass snake, breeding birds, and loss of species-rich grassland and ponds. | Biodiversity mitigation and enhancement proposals are outlined at Section 10.7 below and detailed in the Indicative Biodiversity Mitigation and Enhancement Plan contained within the Biodiversity Strategy (Document Ref. 5.11). |
| Environmental and Biodiversity Enhancement | Natural England notes that the enhancement measures that have been described for this project are the addition of log pile refuges and bird nest boxes. These measures are welcomed by Natural England, however we did not believe that given the nature and scale of the development that these enhancements measures are adequate in terms of creating a net environmental gain from the development. Natural England would encourage the applicant to consider additional enhancement measures to provide further benefits to the local environment. For example, as stated in the Lincolnshire Biodiversity Action Plan, this | Since the publication of the PEI Report, in response to this comment, the proposed mitigation and enhancement measures have been reviewed and additional measures have been added – see Section 10.7 and the Indicative Biodiversity Mitigation and Enhancement Plan contained within the Biodiversity Strategy (Document Ref. 5.11). |

| PARAMETER | COMMENT | RESPONSE |
|---|---|---|
| | county is considered a national stronghold for water vole, it is noted that the species were present in older surveys of the ditches around the perimeter of the site, however, the most recent survey only found limited evidence of water vole. Therefore perhaps further enhancement works could be carried out to improve the habitat suitability around the ditches for this species. | |

Summary of Key Changes to Chapter 10 since Publication of the Preliminary Environmental Information (PEI) Report

10.3.29 The PEI Report was published for statutory consultation in November 2019, allowing consultees the opportunity to provide informed comment on the Proposed Development, the assessment process and preliminary findings through a consultation process prior to the finalisation of this ES.

10.3.30 The key changes since the PEI Report was published are summarised in Table 10.6 below.

**Table 10.6: Summary of key changes to Chapter 10 since publication of the PEI Report**

| SUMMARY OF CHANGE SINCE PEI REPORT | REASON FOR CHANGE | SUMMARY OF CHANGE TO CHAPTER TEXT IN ES |
|---|---|---|
| Updates to Chapter 10 to incorporate updated desk study baseline data. | To ensure the most up to date baseline data is used as part of the EcIA. | Refer to Table 10.2 and Section 10.4. No changes to the assessment conclusions. |
| Additional option for foul drainage discharge (on-site package treatment plant) added. | Update to foul drainage strategy. | Impacts and effects of foul drainage package treatment plant assessed at paragraph 10.6.85. No change to assessment conclusions. |
| Ecological assessment updated to reflect updated noise assessment. | Noise assessment updated to include for updated traffic data and also to provide additional information on the | Additional information on CFA piling impacts and effects added at Section 10.6. No |

| SUMMARY OF CHANGE SINCE PEI REPORT | REASON FOR CHANGE | SUMMARY OF CHANGE TO CHAPTER TEXT IN ES |
|---|---|---|
| | predicted noise levels associated with CFA piling, in response to Section 42 consultation responses. | change to assessment conclusions. |
| Air quality assessment updated to include two other proposed developments that were not assessed within the PEI Report and updates to APIS background data. | Air Quality ADMS 5 modelling was updated This has been considered to ensure the impacts on Ecological reports as a result of the change are appropriately assessed. | Section 10.6 and Chapter 17: Cumulative and Combined Effects have been updated. No change to assessment conclusions. |

## 10.4 Baseline Conditions

10.4.1 The ecological baseline relevant to the Proposed Development is summarised below. Further details of the findings of desk and field based studies, including evaluation of the relative nature conservation value of identified ecological features, are provided in Appendices 10C (Preliminary Ecological Appraisal), 10D (Aquatic Invertebrate Survey), 10E (Water Vole and Otter Survey) and 10F (Reptile Survey) in ES Volume III (Document Ref. 6.4).

Statutory International Nature Conservation Designations within 10 km

10.4.2 The Humber Estuary is approximately 175 m east of the Site. The Estuary is designated as a European Marine Site (EMS), encompassing designations as a Special Area of Conservation (SAC), SPA and Ramsar site because of its estuarine and intertidal habitats that support internationally important populations of wintering birds (especially geese, ducks and waders) during the migration periods and in winter. In summer, the Humber Estuary supports important breeding populations of bittern (*Botaurus stellaris*), marsh harrier (*Circus aeruginosus*), avocet (*Recurvirostra avosetta*) and little tern (*Sterna albifrons*). The marine species sea lamprey (*Petromyzon marinus*), river lamprey (*Lampetra fluviatilis*) and grey seal (*Halichoerus grypus*) are also designated features of the SAC.

10.4.3 There are no other international nature conservation designations within a 10 km radius of the Site, which is the worst case zone of influence defined in Table 10.3. This search radius is sufficient to identify all designations relevant to the assessment of potential air quality impacts.

10.4.4 A signposting report to inform Habitats Regulations Assessment (HRA) of the Proposed Development has been prepared (refer to Document Ref 5.8).

Statutory National and Local Nature Conservation Designations within 2 km

10.4.5 The Humber Estuary is also designated as a Site of Special Scientific Interest (SSSI), the boundary of which largely overlaps with the SPA, SAC and Ramsar designated site boundaries. There are no other statutory national or local nature conservation designations within 2 km of the Site.

Non-Statutory Nature Conservation Designations within 2 km

10.4.6 Four Local Wildlife Sites (LWS) were identified in the desk study area:

- Healing Cress Beds Stallingborough LWS – approximately 0.7 km south-west;
- Sweedale Croft Drain LWS – approximately 0.8 km south-east;
- Laporte Road Brownfield Site LWS – approximately 1 km north-west; and
- Fish Ponds to the West of Power Station, Stallingborough LWS – approximately 1 km south-west.

Habitats

10.4.7 The Main Development Area is bounded to the north by South Marsh Road, to the east by the cooling water pumping station, beyond which is the Humber Estuary, to the west by the South Humber Bank Power Station (SHBPS) and to the south by a large arable field. Further information on the habitats present on the Site is provided in Appendix 10C (PEA) in ES Volume III (Document Ref. 6.4), and a brief summary is provided below.

10.4.8 The Proposed Development is located on an area of land adjacent to the existing SHBPS that has been created and managed for the benefit of nature conservation since the late 2000s. The land was seeded with a wildflower seed mix.

10.4.9 There are a number of drainage ditches around the margins of the Main Development Area.

10.4.10 The wildflower grassland within the Main Development Area is evaluated to be of District nature conservation value. The grassland meets the GLNP LWS site selection criteria for 'neutral grassland' because the area exceeds 0.1 ha and has eight or more scoring grassland species from the GLNP criteria list. The grassland is not considered to merit county value, despite meeting the LWS selection criteria, because it originates relatively recently from a sown seed mixture. As such, the grassland does not represent long-standing grassland habitat.

10.4.11 The traditional orchard in the Wider Survey Area to the west of SHBPS was planted as part of the nature improvements to the Site approximately 10 years ago. Although marked as a Priority Habitat by GLNP as it has more than 5 trees with the edges of the crowns less than 20m apart, it has been classed as district value to lacking the age and suitable habitat mosaic that would merit county value.

10.4.12 The ditches do not support habitats notable on their own merits and instead have been valued in terms of their importance for the protected species otter and water vole, and their aquatic invertebrate interest (see below).

Protected and Notable Species

10.4.13 The following protected and notable ecology species were identified either as present in association with the Site, or potentially within the zone of influence of the Proposed Development:

- breeding birds;
- wintering birds (on Site and in adjacent habitats);
- reptiles;
- water vole;
- otter; and
- aquatic invertebrates.

*Breeding Birds*

10.4.14 The habitats within the Main Development Area do not have the potential to support important assemblages of nesting birds but do provide limited opportunities for nesting birds. Ground nesting birds such as skylark (*Alauda arvensis*) and meadow pipit (*Anthus pratensis*) may be present. Birds may also utilise the ditches within the Main Development Area for foraging.

10.4.15 Breeding birds noted during the course of the Phase 1 Habitat survey (2018) that may nest in habitats within the Main Development Area included sedge warbler (*Acrocephalus schoenobaenus*), reed warbler (*Acrocephalus scirpaceus*), reed bunting (*Emberiza schoeniclus)*, yellow wagtail (*Motacilla flava*) and linnet (*Carduelis cannabina*). Based on the habitats recorded, the Main Development Area can be expected to support an assemblage of up to Site value.

10.4.16 The Applicant has confirmed the presence of nesting peregrine falcon (*Falco peregrinus*) at SHBPS, which is adjacent to the Main Development Area. A pair of peregrine falcons was incidentally recorded during several other surveys undertaken at the Site in 2018, and it is assumed that this pair nests on SHBPS. Peregrine falcons are listed on Schedule 1 (Wildlife and Countryside Act 1981 (as amended)), for which there are additional offences of disturbing these birds at their nests, or their dependent young. The UK population of this species has increased substantially in recent times thought likely due to an increase in conservation efforts and control of persecution, as well as the adaptability of the species to exploit previously unused nesting sites e.g. in urban environments (Banks et al., 2003). It is evaluated that this species is of Local nature conservation value.

*Wintering Birds (Site)*

10.4.17 The Proposed Development occupies a parcel of grassland in close proximity to the Humber Estuary SPA/ Ramsar, in which a number of shallow scrapes have been constructed to attract feeding, loafing and roosting birds at high tide that are displaced from coastal mudflats. This area where scrapes have been constructed is referred to as ‘Field 39’ in the South Humber Bank Wintering Bird Surveys undertaken in 2007/08 and 2010/11 to inform the South Humber Gateway strategic mitigation approach (Policy 9 in the NE Lincolnshire Local Plan).

10.4.18 Surveys of the Site in winter 2007/ 08 recorded very few SPA/ Ramsar birds. Turnstone were recorded in small numbers (1 or 2 birds) at the far eastern end of the field (i.e. nearest to the coastal mudflats) in November, December, January, February and March across this period. The only other species recorded were redshank (one record of 1 bird in December 2017, and curlew (two records of 7 birds in January 2008, and one record of 1 bird in April 2008). No birds were recorded in the field in the 2010/11 surveys. A summary of the peak counts of birds in the 2007/08 survey season is provided in Table 10.7, with comparison against the Humber Estuary 5-year peak mean counts (from Frost *et al*., 2018) and the thresholds for international importance.

10.4.19 Despite the low numbers of records of SPA/ Ramsar birds within the Main Development Area, and that none were recorded in numbers above the 1% threshold of the Humber Estuary population[2], given its proximity to the Humber Estuary it is considered to be functionally linked to the Humber Estuary SPA/ Ramsar. A precautionary approach has been taken to the assessment, because the survey data are now somewhat out of date and the plot may have become more suitable for wintering birds in the interim period due to sensitive management of the grassland on the Site. The Site is therefore evaluated to be of District nature conservation value to wintering birds.

**Table 10.7: Peak counts and importance of Site to wintering birds (Field 39)**

| SPECIES | PEAK COUNT ON SITE (2007/08) | HUMBER ESTUARY 5-YEAR MEAN PEAK COUNT | PERCENTAGE OF HUMBER ESTUARY POPULATION ON SITE | THRESHOLD FOR INTERNATIONAL IMPORTANCE |
|---|---|---|---|---|
| Turnstone | 2 | 249 | 0.8% | 1,400 |
| Redshank | 1 | 3,368 | 0.03% | 2,400 |
| Curlew | 7 | 2,806 | 0.2% | 8,400 |

*Wintering Birds (Field to the South)*

10.4.20 The large arable field to the south of the Site, for which the southern boundary is defined by Oldfleet Drain, is referred to as 'Field 37' in the South Humber Bank counts.

10.4.21 This field regularly supports lapwing, curlew and golden plover across the winter months, and is noted to be an important field in the South Humber Bank survey area for high tide roosting, loafing and feeding birds. Although outside the Humber Estuary SPA/ Ramsar designated site boundary, this field is considered to be functionally linked to the SPA/ Ramsar. A summary of the survey results, with the peak counts from the three seasons of survey in 2006/07, 2007/08 and

[2] The 1% threshold of the Humber Estuary population is used to identify key terrestrial areas within the Estuary that support the SPA/ Ramsar assemblage, and which would be considered to be of County or higher importance.

2010/11 is provided in Table 10.8, with comparison against the Humber Estuary 5-year mean peak counts (from Frost *et al*., 2018) and thresholds for international importance.

10.4.22 Sparrowhawk, buzzard (*Buteo buteo*), peregrine falcon and barn owl (*Tyto alba*) were all recorded hunting over the field during the survey period. Other records were made during the survey period of snow bunting (*Plectrophenax nivalis*) and snipe (*Gallinago gallinago*).

10.4.23 This field is evaluated as being of Regional importance to nature conservation for its wintering and passage bird assemblage, for which several key SPA/ Ramsar species have been recorded in numbers above the 1% threshold of the Humber Estuary population. The eastern part of this field has been allocated in the Local Plan for the creation of strategic mitigation habitat for waterbirds as part of the SHG strategic mitigation strategy.

**Table 10.8: Peak counts and importance of Site to wintering birds (Field 37)**

| SPECIES | PEAK COUNT ON SITE (2006/07 – 2010/11) | HUMBER ESTUARY 5-YEAR MEAN PEAK COUNT | PERCENTAGE OF HUMBER ESTUARY POPULATION ON SITE | THRESHOLD FOR INTERNATIONAL IMPORTANCE |
|---|---|---|---|---|
| Curlew | 75 | 2,806 | **2.7%** | 8,400 |
| Golden plover | 228 | 33,994 | 0.7% | 9,300 |
| Lapwing | 510 | 11,702 | **4.4%** | 20,000 |
| Ringed plover | 17 | 1,089 | **1.6%** | 730 |
| Black-tailed godwit | 15 | 2,951 | 0.5% | 610 |
| Mallard | 46 | 1,204 | **3.8%** | 20,000 |

*Wintering Birds (Fields to the North)*

10.4.24 Two large arable fields to the north of the Proposed Development (on the north side of South Marsh Road) were also included within the baseline study area; these are Fields 30 and 31 in the South Humber Bank counts.

10.4.25 These fields are also considered to be functionally linked to the Humber Estuary, and although in the most recent survey years they have supported very low numbers of birds, peak counts in 2006/07 for golden plover and lapwing were particularly significant. A summary of the survey results, with the peak counts from the three seasons of survey in 2006/07, 2007/08 and 2010/11 is provided in Table 10.9, with comparison against the Humber Estuary 5-year mean peak counts (from Frost *et al*., 2018) and thresholds for international importance.

10.4.26 This field is evaluated as being of Regional importance to nature conservation for its wintering and passage bird assemblage, for which several SPA/ Ramsar

species have been recorded in numbers well above the 1% threshold of the Humber Estuary population.

**Table 10.9: Peak counts and importance of Site to wintering birds (Fields 30 and 31)**

| SPECIES | PEAK COUNT ON SITE 2006/07 – 2010/11 | HUMBER ESTUARY 5-YEAR MEAN PEAK COUNT | PERCENTAGE OF HUMBER ESTUARY POPULATION ON SITE | THRESHOLD FOR INTERNATIONAL IMPORTANCE |
|---|---|---|---|---|
| Curlew | 41 | 2,806 | **1.5%** | 8,400 |
| Golden plover | 3,600 | 33,994 | **10.6%** | 9,300 |
| Lapwing | 1,130 | 11,702 | **9.7%** | 20,000 |
| Ringed plover | 16 | 1,089 | **1.5%** | 730 |
| Mallard | 6 | 1,204 | 0.5% | 20,000 |

*Wintering Birds (Coastal Mudflats)*

10.4.27 The nearest coastal mudflats to the Site are within the boundary of the Humber Estuary SPA/ Ramsar, and are approximately 175 m from the eastern boundary of the Main Development Area. This is an extensive area of mudflat referred to as the 'Pyewipe mudflats', which extend from the southern end of Immingham Docks south to Grimsby Docks. This mudflat supports large aggregations of birds, particularly black-tailed godwit for which this part of the Estuary is favoured by this species. As they form part of the Humber Estuary SPA/ Ramsar designation this area of mudflats is considered to be of International importance for the purposes of assessment.

*Reptiles*

10.4.28 The habitats within the Site boundary were appraised in the PEA as being of potential suitability for grass snake (*Natrix helvetica*) and common lizard (*Zootoca vivipara*).

10.4.29 The habitats within the Main Development Area were subsequently surveyed for reptiles, and the survey results are presented in Appendix 10F (Reptile Survey Report) in ES Volume III (Document Ref. 6.4). No reptiles were recorded during the surveys. However, given the suitability of the ditch habitats for foraging and basking grass snake, it is considered that there remains a risk that this species may be present on occasion on a transitory basis. Given the lack of reptile records during the surveys, the Main Development Area is evaluated as being of low suitability for reptiles. Reptiles are therefore scoped out of the EcIA, except for consideration of requirements for precautionary mitigation to address the low residual risk of grass snake being present on a transitory basis.

*Water Vole*

10.4.30 Previous surveys of the Site (Humber INCA, 2010) confirmed the presence of water vole in ditches surrounding the perimeter of the Site. The water vole survey

undertaken in early October 2018 found limited evidence of water voles, with only a small number of water vole burrows and latrines recorded. There were also *ad-hoc* reports of characteristic water vole 'plops' in the ditches during the undertaking of other surveys on the Site. It has not been possible to calculate a population size class assessment given the limited number of latrines recorded.

10.4.31 A repeat water vole survey was undertaken in October 2019 and no evidence of water vole activity was recorded, however vegetation around the ditches had been strimmed recently and this may have affected the results of the survey.

10.4.32 The desk study returned numerous records of water vole in the desk study area, and it appears that the species is widespread and common in the local area, including on Oldfleet Drain to the south of the Site (Atkins, 2018). The Lincolnshire BAP states that the county is considered a national stronghold for water vole. The population of water voles within the Main Development Area is therefore evaluated to be of District nature conservation value.

*Otter*

10.4.33 Fresh otter spraints were recorded on a reptile mat close to the ditch which runs along the southern boundary of the Main Development Area in early September 2018. An older spraint was recorded on an outfall pipe on the ditch along the western boundary of the Site. No evidence of otter activity was recorded in 2019, and there is no suitable habitat to support resting otter within the Main Development Area, however it is likely that otters are foraging throughout the ditch networks, which are well connected to coastal habitats and further ditches running north-south along the landward base of the flood embankment, as well as other good quality otter foraging habitat on Middle Drain (north of the Site) and Oldfleet Drain (south of the Site).

10.4.34 Otter is noted in the Lincolnshire BAP to be present in all river catchments in the county, and was subsequently removed from the list of Species Action Plans in the third edition of the Lincolnshire BAP (having been included in the second edition) due to its widespread nature. Otters within the Main Development Area are therefore evaluated as being of Local nature conservation value.

*Aquatic Invertebrates*

10.4.35 None of the aquatic invertebrates recorded within the surveyed waterbodies receive specific legal protection by way of Schedule 5 of the WCA, or are listed pursuant to Section 41 of the NERC Act as being of principal importance for nature conservation in England. Survey results are presented in Appendix 10D (Aquatic Invertebrates Survey Report) in ES Volume III (Document Ref. 6.4).

10.4.36 The three ditches surveyed were found to support a moderate diversity of aquatic macroinvertebrates considered fairly typical of a small, slow flowing drain.

10.4.37 Only one notable aquatic invertebrate species was recorded. This was smooth ram's-horn snail (*Gyraulus laevis*) which was recorded from Ditch 2 (which runs approximately north-south in the southern part of the Main Development Area – see Appendix 10D, Annex A in ES Volume III, Document Ref. 6.4). This snail species is associated with shallow, slow flowing waters, rivers, lakes and ponds, usually found on weeds but sometimes on muddy bottoms and on stones. It is

Nationally Scarce, and although not currently threatened in Great Britain, is suffering from adverse habitat loss (Seddon *et al*., 2014).

10.4.38 Ditch 1 (which runs approximately east-west along the south-eastern boundary of the Main Development Area) and Ditch 3 (which runs along the northern boundary of the Main Development Area) (see Appendix 10D, Annex A in ES Volume III, Document Ref. 6.4) are evaluated as being of Local nature conservation value. Ditch 2 is evaluated as being of District nature conservation value as it supported a higher diversity of aquatic macroinvertebrates, including the Nationally Scarce smooth ram's-horn snail.

Summary of Baseline

10.4.39 A summary of the baseline ecology conditions at the Main Development Area is provided in Table 10.10 below. As discussed in the methods section, all ecology features valued at Local level or above have been taken forward for impact assessment, where there is the potential for these features to be affected either directly or indirectly.

**Table 10.10: Summary of baseline ecology features**

| ECOLOGY FEATURE | NATURE CONSERVATION VALUE | JUSTIFICATION | TAKEN FORWARD FOR ASSESSMENT? |
|---|---|---|---|
| Humber Estuary SPA/ SAC/ Ramsar/ SSSI (which together comprise the Humber Estuary European Marine Site) | International | Site supports qualifying features under the relevant EC Directives that are of international importance. | Yes – potential for direct and indirect effects on habitats and qualifying features. |
| Healing Cress Beds LWS | County | Meets LWS selection criteria. | Yes – potential for air quality impacts. |
| Sweedale Croft Drain LWS | County | Meets LWS selection criteria. | Yes – potential for air quality impacts. |
| Laporte Road Brownfield Site LWS | County | Meets LWS selection criteria. | Yes – potential for air quality impacts. |
| Fish Ponds to the West of Power Station, Stallingborough LWS | County | Meets LWS selection criteria. | Yes – potential for air quality impacts. |
| Semi-improved neutral grassland | District | Grassland meets the area and species-diversity | Yes – this habitat will be entirely lost to the |

| ECOLOGY FEATURE | NATURE CONSERVATION VALUE | JUSTIFICATION | TAKEN FORWARD FOR ASSESSMENT? |
|---|---|---|---|
| | | criteria for LWS selection in the greater Lincolnshire area, but has originated relatively recently from a sown mixture. | Proposed Development. |
| Traditional Orchard | District | Small young orchard planted approx. 10 years ago within limited mosaic habitat. Traditional Orchards are marked as Priority Habitats by GLNP | No, outside Main Development Area. |
| Breeding birds (non-Schedule 1) | Site | Small number of breeding pairs likely to be present within broadleaved woodland and scrub habitat; and ground-nesting birds in grassland habitat. Reeds in ditches also provide suitable nesting habitat for a range of species. | No. |
| Breeding birds (Schedule 1) | Local | Pair of peregrine falcons assumed to be nesting on SHBPS. | Yes – although outside the Main Development Area, potential for impacts to nesting peregrine falcon as a result of noise and visual disturbance during construction. |
| Wintering birds (Site) | District | Habitats on Site support very low numbers of SPA/ Ramsar birds, but | Yes – habitats will be lost to the Proposed Development. |

| ECOLOGY FEATURE | NATURE CONSERVATION VALUE | JUSTIFICATION | TAKEN FORWARD FOR ASSESSMENT? |
|---|---|---|---|
| | | are still considered to be functionally linked to the SPA/ Ramsar due to their proximity to the coastal environment. | |
| Wintering birds (off Site) | Regional | Habitats off Site support important aggregations of wintering/ passage birds including those that are the qualifying features of the Humber Estuary SPA/ Ramsar wintering assemblage. | Yes – potential for indirect impacts such as noise/ vibration and visual disturbance during construction and operation. |
| Wintering birds (Pyewipe mudflats within Humber Estuary SPA/ Ramsar) | International | Coastal mudflats adjacent to the Site support important assemblages of waterbirds and are within the boundary of the Humber Estuary SPA/ Ramsar. | Yes – potential for indirect impacts such as noise and visual disturbance during construction and operation. |
| Reptiles | Absent | - | No. |
| Water vole | District | Present on all perimeter ditches within the Proposed Development boundary. Widespread in the county but populations have declined substantially across the UK. | Yes – potential for direct and indirect impacts on habitats. |
| Otter | Local | Recorded on Site, likely to use all suitable ditches within Proposed Development boundary (foraging | Yes – potential for direct impacts and loss of foraging habitat. |

| ECOLOGY FEATURE | NATURE CONSERVATION VALUE | JUSTIFICATION | TAKEN FORWARD FOR ASSESSMENT? |
|---|---|---|---|
| | | otter only). Widespread in the county. | |
| Aquatic invertebrates | Local for Ditches 1 and 3<br><br>District for Ditch 2 | Presence of diverse aquatic macroinvertebrates including the Nationally Scarce smooth ram's-horn snail. | Yes – potential for direct impacts. |

Future Baseline

*At Construction*

10.4.40 It is reasonable to assume that the current grassland and ditch management regime would continue in the absence of development, and therefore the habitats within the Main Development Area would not be expected to change over this timeframe. Similarly, it is reasonable to assume that any protected species potentially present within the Main Development Area and wider Site (breeding birds, wintering birds, water vole and otter) would remain present in these habitats over this timeframe.

10.4.41 The surrounding fields, assuming they remain under arable cultivation (or some are enhanced as part of the strategic habitat mitigation proposals for the South Humber Industrial Investment Programme (SHIIP)), would also be expected to maintain their suitability for high tide feeding, roosting and loafing SPA/ Ramsar birds. At Opening

10.4.42 Again, assuming the current management of the Site continues in the absence of development, there would be no changes in the habitat or protected species baseline expected over this timeframe. The main assessment presented in Section 10.6 below assesses the impacts and effects of the Proposed Development against this future baseline without the Consented Development.

*At Decommissioning*

10.4.43 Over a longer timeframe, again in the absence of development and assuming the current management of the Site continues (i.e. annual grass cutting and cutting back of ditch vegetation), it is reasonable to assume there will be no significant changes in the majority of the baseline habitats.

10.4.44 The value of the surrounding arable fields to waterbirds may change (for better or worse) over this timeframe. There has been a general decline in many bird species recorded in the Humber Estuary SPA/ Ramsar, and increases in others. The exact reasons for these changes are not known, but may be linked to climate change and breeding success in their summer breeding grounds, many of which are outside the UK.

10.4.45 The coastal sea defences to the east of the Proposed Development fall within Policy Unit L of the Humber Estuary Shoreline Management Plan (SMP) (Scott Wilson, 2010). The policy for this stretch is to 'hold the line' for all epochs covered by the SMP, which extends to 2105. Throughout this period, further action will be taken to sustain the current level of flood risk in the future in response to the potential increase in risk from climate change. The SMP concluded that this may result in limited managed realignment being required due to the potential impacts on the intertidal environment associated with the Humber Estuary SAC/ SPA/ Ramsar as a result of the interruption of coastal processes and the effects of coastal squeeze. This section of coastline may therefore decline in its suitability for waterbirds over the future baseline scenario. This may lead to a corresponding decrease in the numbers of waterbirds using the coastal fields surrounding the Proposed Development.

## 10.5 Development Design and Impact Avoidance

10.5.1 The design process for the Proposed Development has included consideration of ecological constraints and has incorporated, where possible, measures to reduce the potential for adverse ecological effects, in accordance with the mitigation hierarchy and relevant planning policy. The measures identified and adopted include those that are inherent to the design of the Proposed Development, and those that can realistically be expected to be applied as part of construction environmental best practice, or as a result of legislative requirements.

10.5.2 The development design and impact avoidance measures have been, or would be, adopted during the construction, operation and decommissioning phases of the Proposed Development. These are set out below.

Construction

*Measures to Avoid Impacts on the Humber Estuary SPA/ Ramsar*

10.5.3 The calculation of the sum of money required for the application of Policy 9 to the Proposed Development (to contribute towards the SHG strategic mitigation land that has been delivered at Cress Marsh, which is part of a wider package of 120 ha of strategic mitigation land to be delivered in the SHG region for the SHIIP) was undertaken for the Consented Development. The same will apply to the Proposed Development as the area of land to be lost is the same. This ensures that the loss of functionally linked land within the footprint of the Proposed Development will not result in adverse effects on the integrity of the Humber Estuary SPA/ Ramsar, and is therefore compliant with the Habitat Regulations see HRA Signposting Report (Document Ref. 5.8).

10.5.4 The total sum of money to be commuted to NELC to contribute to the SHG mitigation scheme is calculated as follows: Site Area[3] x £11,580. The financial contribution for the Consented Development was secured by a Section 106 agreement and this provision would be varied to ensure that the financial contribution would also be secured for the Proposed Development (although the

3 This will be calculated based on the footprint of the Main Development Area.

sum would only need to be paid once, for either the Consented Development or the Proposed Development, as explained above).

10.5.5 In addition, a close board fence approximately 2.5 m in height will be installed along part of the southern boundary of the Site (see Figure 4.2 in ES Volume II, Document Ref. 6.3), to provide visual screening during construction and operation to the adjacent field to the south (Field 37). This field has been identified as a key high tide roost for SPA/ Ramsar waterbirds, and the eastern portion of the field is allocated as part of the SHG strategic mitigation package for the SHIIP (referred to in the SHIIP documents as 'Mitigation Site C').

*Measures to Avoid Impacts on Water Vole*

10.5.6 The layout of the Proposed Development has been designed to accommodate a minimum 5 m undeveloped buffer zone along the banks of all perimeter ditches, to avoid damage and disturbance to the main water vole habitats (i.e. the ditches) associated with the Main Development Area during construction and operation (with the exception of the new site access which will cross the northern perimeter ditch). The buffer zone will be fenced from the Proposed Development to prevent accidental damage during construction.

*General Good Practice*

10.5.7 The construction phase of the Proposed Development will comply with industry good practice and environmental protection legislation during construction in relation to prevention of surface and ground water pollution, fugitive dust management and noise prevention or amelioration. In support of this, the construction contractor will prepare and implement a Construction Environmental Management Plan (CEMP) detailing all requirements for environmental protection and legal compliance. A Framework CEMP is provided in Appendix 5A (ES Volume III, Document Ref. 6.4).

10.5.8 To ensure legislative compliance in relation to nesting birds, all clearance of suitable vegetation (notably any areas of scrub) during site preparation would be undertaken outside the breeding season (which is typically March-August inclusive for most avian species), where possible. In situations where this is not possible, an ecologist would survey the working area for nests before works commence. If nests were discovered, appropriate mitigation would be implemented to ensure that they are not disturbed or destroyed before any works can commence in that area. This would include imposing an appropriate exclusion zones between the works and nest(s) and suspending vegetation clearance works within the area until any young had fledged.

10.5.9 Precautionary measures will be implemented to prevent trapping wildlife in construction excavations, in order to ensure compliance with animal welfare legislation. Any excavations deeper than 1 m would be covered overnight, or where this is not practicable, a means of escape would be fitted (e.g. battered soil slope or scaffold plank situated at or below a 45º angle), to allow animals (e.g. otter) to vacate excavations should they fall in.

10.5.10 An ecological watching brief will be carried out during ground clearance of the Main Development Area at the start of the construction phase, including removal of the artificial hibernaculum (see Appendix 10C in ES Volume III, Document Ref.

6.4, Target Note 5 on Figure 10C.4) and the two hay piles (Appendix 10C, Target Note 4 on Figure 10C.4) to prevent harm to reptiles and amphibians that may be present.

10.5.11 Construction temporary lighting would be arranged so that glare is minimised outside the construction site. Measures to minimise the impact of construction lighting will be detailed in the CEMP.

10.5.12 If construction is delayed to one of the later construction programme scenarios as set out in Chapter 5: Construction Programme and Management, an update ecological walkover survey will be required to confirm there are no changes to the baseline conditions, particularly with regard to mobile species such as [redacted].

Operation

10.5.13 Lighting impacts beyond the Site boundary will be minimised as far as possible, for example by directing lighting away from adjacent habitats, in accordance with the lighting design for the scheme set out in the Indicative Lighting Strategy (Document Ref. 5.12).

10.5.14 Air quality impacts on designated sites will be minimised through the use of design constraints such as stack heights, air exit velocities and temperatures to aid dispersion of pollutants, and emissions monitoring to demonstrate continued compliance with emission limit values set by the Environment Agency through an Environmental Permit required for the operation of the Proposed Development.

10.5.15 Surface water discharge will be attenuated to green-field run-off rates and therefore there would be no changes in the flow rate within the adjacent drainage ditches. There is therefore no potential for adverse operational effects on the ditch habitats and the protected species they support (water vole).

10.5.16 Domestic foul drainage will be discharged to foul sewer, tankered off-site, or treated on-site using a package treatment plant which discharges to one of the surface water ditches within the Main Development Area (which ultimately discharges to the Humber Estuary). If treated foul drainage is discharged to surface water, the volume will be small and this is not considered to represent a potential adverse operational effect on the ditch habitats and the protected species they support (water vole).

Decommissioning

10.5.17 Further site surveys will be undertaken in advance of decommissioning works, to determine the status of protected species and to evaluate the habitats present that may be impacted. Relevant avoidance and mitigation measures would be specified and implemented with reference to the findings of the above surveys.

10.5.18 The following measures will be implemented as appropriate:

- survey findings and associated mitigation requirements will be discussed and agreed with stakeholders as required prior to the start of works;
- relevant stand-off working distances will be identified by the project ecologist and implemented to avoid effects, where practicable, particularly along the banks of ditches where a minimum 5 m buffer zone should be achieved (if water vole is still present);

- all necessary protected species licences will be obtained to derogate unavoidable impacts on relevant protected species. Mitigation and monitoring will be implemented in accordance with the requirements of the relevant licences;
- works will be planned to avoid key risk periods (seasons) where appropriate and practicable; and
- relevant works will be undertaken under the supervision of an Ecological Clerk of Works to deliver compliance with relevant legislation and approved mitigation.

## 10.6 Likely Impacts and Effects

The Proposed Development

10.6.1 The impacts and effects of the Proposed Development compared to a future baseline without the Consented Development are described below.

***Construction***

10.6.2 This section describes the impacts and potential effects during the construction phase of the Proposed Development on relevant ecological features in the absence of any mitigation, over and above that which is inherent to the design.

10.6.3 To enable a focussed impact assessment, screening was undertaken of potential impacts of the construction phase that are likely to result in adverse or beneficial effects on relevant ecological features and that require further impact assessment. The relevant impacts are taken forward in the more detailed impact assessment that follows. Those impacts that are considered unlikely to result in effects are scoped out and not considered further.

10.6.4 The following potential source-receptor pathways have been scoped out of the impact assessment:

- dust smothering of habitats within the Humber Estuary SAC/ SSSI – there are no terrestrial SAC/ SSSI habitats within the zone of influence of fugitive dust emissions during the construction phase, which is reasonably expected to be very small (see Chapter 7: Air Quality). The nearest terrestrial habitat within the designations (coastal saltmarsh) is approximately 500 m from the Main Development Area, and at this distance no dust smothering would be anticipated;
- noise/ visual disturbance to SPA/ Ramsar qualifying breeding bird species (bittern, marsh harrier, avocet and little tern) – there is no suitable habitat for the qualifying species of breeding birds within the potential zone of influence of noise and visual disturbance arising from the construction of the Proposed Development. There is therefore no pathway by which these features could be affected by the construction of the Proposed Development;
- noise/ visual disturbance to birds within the SHG mitigation area at Cress Marsh, which is approximately 500 m south-west of the Main Development Area – all construction activities will be on the eastern side of the SHBPS, which provides screening of the construction works to waterbirds using the Cress Marsh mitigation area.

- vibration impacts on the Humber Estuary SPA/ Ramsar – this pathway was scoped out of assessment based on distance and baseline conditions (see Chapter 8: Noise and Vibration); and
- air quality impacts on intertidal and subtidal habitats in the SAC/ SSSI – intertidal habitats are not susceptible to the effects of changes in air quality arising from construction (through dust deposition and smothering of habitats) because of their regular tidal inundation. Subtidal habitats have similarly been scoped out.

10.6.5 Impacts during the construction period that have potential to result in significant effects on relevant ecological features, and which were screened into the impact assessment, are considered further below:

- potential effects on Humber Estuary SAC/ SPA/ Ramsar/ SSSI (loss of functionally linked habitat for wintering birds, noise/ vibration and visual disturbance and surface water pollution);
- loss of semi-improved neutral grassland;
- potential effects on aquatic invertebrates (loss/ damage to habitat and surface water pollution);
- potential effects on Schedule 1 breeding birds (disturbance), specifically peregrine falcon;
- potential effects on water vole (loss/ damage to habitat, noise and visual disturbance); and
- potential effects on otter (loss/ damage to habitat, noise and visual disturbance).

Potential Effects on Humber Estuary SAC/ SPA/ Ramsar/ SSSI During Construction

*Loss of High Tide Roosting/ Loafing/ Feeding Habitat that is Functionally Linked to the SPA/ Ramsar*

10.6.6 Although the habitat within the Site boundary has been demonstrated to support low numbers of SPA/ Ramsar waterbirds, and there have been no recorded aggregations above 1% of the Humber Estuary threshold, a precautionary approach has been applied to the Proposed Development because it lies within the Mitigation Zone to which Policy 9 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"*.

10.6.7 To ensure Habitats Regulations compliance for the Proposed Development, it has been assumed that the land within the Proposed Development boundary is 'functionally linked' to the Humber Estuary SPA/ Ramsar. This policy has therefore been applied to the Site and the Proposed Development. Taking into account this embedded mitigation, the Proposed Development is assessed to give rise to a neutral effect on the Humber Estuary SPA/ Ramsar as a result of the loss of functionally linked habitat.

*Noise Disturbance to Qualifying SPA/ Ramsar Wintering Bird Assemblage at Pyewipe Mudflats*

10.6.8 A noise impact assessment has been completed, and baseline monitoring and noise modelling undertaken to determine whether the Proposed Development would result in any construction phase noise impacts on waterbirds in the nearest part of the Humber Estuary SPA/ Ramsar (see Chapter 8: Noise and Vibration), which is at the Pyewipe mudflats (represented by Receptor R3 on Figure 8.1 in ES Volume II, Document Ref. 6.3). The dB $L_{Aeq,1h}$ values provide an 'average' of noise levels expected to occur in any one hour as a result of each activity. Such 'continuous equivalent noise levels' form the basis of most noise assessment protocols, but are of limited relevance when considering the effect of noise on waterbirds because waterbirds are perceived to be more susceptible to being disturbed by short, sharp 'peaks' of noise e.g. during piling (IECS, 2009). Therefore, for piling activities, the $L_{Amax}$ values have been predicted at the nearest sensitive receptors to provide an indication of the likely 'peak' noise events so that they can be compared to the ambient conditions.

10.6.9 Ambient noise levels at noise receptor R3 (on the seawall at the edge of the Humber Estuary SPA/ Ramsar boundary) were recorded at 47 – 53 dB $L_{Aeq,T}$ (see Table 8.14 in Chapter 8: Noise and Vibration). The main sources of noise at this location were found to be waves breaking along the shoreline and birdsong. Occasional vehicle usage along the top of the sea wall (motorbikes and quad bikes) resulted in an increase in ambient noise, with a peak noise range of 51.3 – 77.7 dB $L_{AFMax15\ min}$.

10.6.10 Predicted noise levels for the majority of construction activities at R3 were predicted to be within the range 47 – 52 dB $L_{Aeq,1hr}$, which is within the ambient range at the nearest part of Pyewipe mudflats. There will therefore be no discernible change in the noise levels reaching the Humber Estuary SPA/ Ramsar during the majority of the construction phase of the Proposed Development.

10.6.11 The noisiest construction activity that potentially could be used is drop hammer piling, which the modelling predicts will result in noise levels of 62 dB $L_{Aeq,1hr}$ at R3, which represents an exceedance in the ambient noise level by up to 4 dB. In addition, the type of noise being emitted by drop hammer piling (regular impulsive high noise levels) may be considered as more disturbing to birds. An estimation of the peak noise from drop hammer piling activity results in predicted levels of 75 dB $L_{Amax}$ at the nearest part of the Estuary. This is significantly higher than the ambient noise level at the measured location on the edge of the Estuary, although as discussed above it is reasonable to assume that there would be some attenuation due to the topography of the seawall, and the fact that the mudflats are below the level of the measured receptor location.

10.6.12 Previous studies such as IECS (1999) and ERM (1996) have demonstrated that birds occupying mudflats elsewhere in the Estuary, such as the Salt End and Pyewipe mudflats, are relatively tolerant of piling noise levels (e.g. marine piling to construct new jetties). Based on bird behaviour and noise monitoring studies undertaken by Xodus Group during construction piling for the Grimsby River Terminal (Xodus Group 2012), the significance criteria for disturbance to birds are summarised below:

- ≤ 65 dB $L_{AmaxF}$ – negligible;
- > 65 to ≤ 75 dB $L_{AmaxF}$ – minor adverse;
- > 75 to ≤ 85 dB $L_{AmaxF}$ – moderate adverse; and
- > 85 dB $L_{AmaxF}$ – major adverse.

10.6.13 The significance levels in the Xodus study were determined based on the visible responses of waterbirds to noise stimuli and included a variety of behaviours including a 'heads-up' response, physical movement on the ground away from the disturbance source and taking flight.

10.6.14 Predicted noise levels across the nearest mudflats are within the range 52-62 dB $L_{Aeq,1hr}$, depending on the piling technique used which represents an exceedance in the ambient noise level by up to 4 dB. However, the peak noise clearly results in a much greater increase in baseline noise levels to which waterbirds may be more susceptible. It is therefore reasonable to conclude that noise impacts (taking into account the regular impulsive nature of drop hammer piling noise, and thus its higher likelihood of disturbance to birds) would result in a minor adverse effect on waterbirds at Pyewipe Mudflats that is not significant.

10.6.15 If CFA piling was to be undertaken instead of drop hammer piling, noise levels will be reduced to 50 dB $L_{Aeq,1h}$ at R3, falling below the ambient noise level at this location. Peak noise levels will also be reduced significantly due to CFA piling not producing regular, impulsive high peak noise levels. There will therefore be no discernible change in the noise levels reaching the Humber Estuary SPA/ Ramsar during the majority of the construction phase of the Proposed Development if CFA piling is used.

*Noise/ Vibration Disturbance to Qualifying SPA/ Ramsar Wintering Bird Assemblage in Adjacent Field to the South*

10.6.16 The noise impact assessment also considers the potential for noise and vibration impacts during construction on the fields to the south of the Proposed Development (i.e. field 37), which although outside the boundary of the Humber Estuary SPA/ Ramsar is considered to be functionally linked due to the important aggregations of wintering waterbirds present (see Chapter 8: Noise and Vibration).

10.6.17 Baseline noise levels were monitored along the southern edge of the Proposed Development at location LT3. This therefore represents the nearest part of the field 37 to the Proposed Development, and is considered to be the worst case for assessment of effects on this receptor because in reality, the majority of waterbirds will be orientated towards the centre of the field/ towards the eastern edge that borders the Estuary (for predator avoidance reasons).

10.6.18 Noise at this location was generally dominated by noise from the SHBPS, as well as noise from the associated cooling water pumping station and the adjacent chemical plant (Synthomer). Ambient noise levels were in the range 47 – 53 $L_{Aeq,T}$ and 49 – 65 dB $L_{AFmax}$.

10.6.19 Predicted noise levels arising from construction at this location are in the range 42 – 73 dB $L_{Aeq,1hr}$, at the nearest modelled receptors (on the boundary fence),

with the noisiest activity assessed, as expected, being the drop hammer piling. This represents an increase of up to 20 dB on the ambient noise levels, which is a significant increase. However, this would be the worst case scenario, with the modelled receptors being right on the boundary fence. In reality, most waterbirds would be located towards the central and eastern portions of this field (closer to the Estuary), and would therefore be further away from the noise source. The estimated noise levels at various points across the field have therefore been examined to establish the proportion of the field that would be subject to construction noise levels in excess of ambient levels. Vibration associated with drop hammer piling is also assessed in Section 8.6 of Chapter 8: Noise and Vibration in ES Volume I and the same approach has been applied to the assessment of effects on birds.

10.6.20 In the centre of field 37, noise from the drop hammer piling activities is predicted to be 62 dB $L_{Aeq,1hr}$, which is still in excess of the ambient noise level. Peak noise resulting from drop hammer piling is estimated to be 76 dB $L_{Amax}$, which is within the 'moderate adverse' disturbance threshold based on the Xodus study considered earlier in this assessment. At even the furthest receptors, estimated peak noise levels are in the range 69 – 70 dB $L_{Amax}$, which would be expected to also result in 'minor adverse' disturbance. For all other construction activities, noise will have attenuated to within the ambient range at this distance from the Proposed Development, and it is reasonable to conclude that the other construction activities would not result in the disturbance or displacement of waterbirds feeding, roosting and loafing in field 37.

10.6.21 In the absence of mitigation, it is therefore assessed that piling noise and vibration associated with construction will likely result in disturbance to birds feeding, roosting and loafing in field 37, if this takes place within the winter months when the highest aggregations of waterbirds are present in the field (September to March inclusive). This may result in displacement of birds within this field i.e. birds choose to move further away from the source of the noise but remain within the field (e.g. moving further south and east), or displacement of birds from this field entirely. This may result in increased energy expenditure as birds are spending more time flying between the mudflats and high tide roosts, and reduced feeding time as they are using more time and energy to find high tide roosting, loafing and feeding sites. This may have adverse effects on body condition and winter survival rates.

10.6.22 It is therefore assessed that in the absence of mitigation, drop hammer piling noise and vibration has the potential to cause moderate disturbance to waterbirds in field 37, and this is assessed as giving rise to a moderate adverse effect on the qualifying wintering bird assemblage of the Humber Estuary SPA/ Ramsar, which is significant. Mitigation is discussed in Section 10.7.

10.6.23 However, if CFA piling is used instead of drop hammer piling, noise levels will be reduced significantly (44 - 59 dB $L_{Aeq,1h)}$. Peak noise levels will also be reduced significantly due to CFA piling not producing regular, impulsive high peak noise levels. There will therefore be no discernible change in the noise levels reaching the qualifying SPA/ Ramsar wintering bird assemblage in the field to the south of the Main Development Area during the majority of the construction phase of the Proposed Development if CFA piling is used.

*Noise/ Vibration Disturbance to Qualifying SPA/ Ramsar Wintering Bird Assemblage in Adjacent Fields to the North*

10.6.24 Fields to the north of the Proposed Development on the north side of South Marsh Road (fields 30 and 31) have also been scoped into the noise and vibration impact assessment, because they are considered to be functionally linked to the Humber Estuary SPA/ Ramsar due to the aggregations of wintering birds they support. These fields are expected to experience typically higher ambient noise levels than those to the south, as a result of HGV and other vehicle movements along South Marsh Road and Hobson Way, which runs along the western boundary of field 30.

10.6.25 The central point of these two fields is approximately 400 m north-west for the nearest part of the Proposed Development. For all construction activities except the drop hammer piling, noise levels will have attenuated to within the ambient range at this distance from the works, and would therefore not be reasonably expected to displace waterbirds in fields 30 and 31. Vibration from drop hammer piling also decreases with distance from the piling location.

10.6.26 For drop hammer piling, the predicted noise level at the centre of the fields is 59 dB $L_{Aeq,1hr}$, which is slightly higher than the ambient noise level. Peak noise levels are estimated to be 72 dB $L_{Amax}$ at this location, which is within the threshold for 'minor adverse' disturbance effects based on the Xodus study previously referred to in this chapter. This may result in some localised displacement of waterbirds within the field, should the drop hammer piling activity overlap with the wintering period when birds are present. However, it is considered that the noise levels are not sufficiently high to result in complete displacement from the fields, particularly given that the southern and western extents of these fields (particularly field 30) are subject to relatively high ambient noise levels as a result of traffic along Hobson Way and South Marsh Road.

10.6.27 It is assessed that, in the absence of mitigation, drop hammer piling noise and vibration has the potential to cause minor disturbance to waterbirds in fields 30 and 31, and this is assessed as giving rise to a minor adverse effect on the qualifying wintering bird assemblage of the Humber Estuary SPA/ Ramsar, which is not significant.

10.6.28 However, if CFA piling is used instead of drop hammer piling, noise levels will be reduced significantly (42 - 62 dB $L_{Aeq,1h)}$. Peak noise levels will also be reduced significantly due to CFA piling not producing regular, impulsive high peak noise levels. There will therefore be a slight increase above ambient in the noise levels reaching the qualifying SPA/ Ramsar wintering bird assemblage in the field to the north of the Main Development Area during the majority of the construction phase of the Proposed Development with CFA piling, however this is within the threshold for negligible disturbance effects based on the Xodus study previously referred to in this chapter.

*Visual Disturbance to Qualifying SPA/ Ramsar Wintering Bird Assemblage at Pyewipe Mudflats*

10.6.29 Given the distance of the Proposed Development from the Pyewipe mudflats, and the fact that construction will be set against the backdrop of the adjacent SHBPS,

it is reasonable to conclude that there is minimal risk of visual disturbance to waterbirds feeding, roosting or loafing within the boundary of the SPA/ Ramsar. Furthermore, the substantial flood embankment wall will provide screening of construction activities to birds present on the mudflats/ shoreline. It is assessed that the Proposed Development will not result in any visual disturbance to waterbirds within the boundary of the Humber Estuary SPA/ Ramsar.

*Visual Disturbance to Qualifying Wintering Bird Assemblage in Adjacent Field to the South*

10.6.30 The nature and scale of the construction activities associated with the Proposed Development will be set against the backdrop of the SHBPS, and will therefore not represent a significant change in the type of structures already present in habitats adjacent to fields used by waterbirds. Regardless of this, it is difficult to predict with any degree of certainty what the response of waterbirds will be to changes in the visual environment. It is reasonable to assume that such birds are resilient to changes that do not directly affect habitats within which they are feeding, roosting and loafing, because they are present in a dynamic and highly commercial environment associated with the busy Humber Estuary. This includes the presence of tall structures such as power stations, bulk handling facilities, jetties and cranes, and the movement of large commercial vessels in and out of the nearby ports of Immingham and Grimsby.

10.6.31 As a precaution, a c.2.5 m high close board fence will be installed along part of the southern boundary of the Site (see Figure 4.2 in ES Volume II, Document Ref. 6.3) during the establishment of the construction site to provide visual screening from vehicle and personnel movements to any waterbirds feeding, roosting or loafing in the field.

10.6.32 Visual impacts on waterbirds feeding, roosting and loafing in the field to the south are, with this mitigation in place, therefore assessed as giving rise to a neutral effect on the qualifying wintering bird assemblage of the Humber Estuary SPA/ Ramsar.

*Surface Water Pollution to Habitats*

10.6.33 The ditches within the Site boundary currently capture surface water run-off and divert it to either Oldfleet Drain (to the south of the Site) or Middle Drain (to the north of the Site), from where it is discharged into the Humber Estuary. In the absence of mitigation, there is therefore the potential for contaminated surface water run-off to enter the drainage system and ultimately the Estuary. These pathways are considered in Chapter 14: Water Resources, Flood Risk & Drainage.

10.6.34 However, potential pollution (with sediment or contaminants) arising from surface water run-off from within the Site during construction will be controlled through the adoption of standard best practice construction methods to meet environmental requirements. This may include temporary measures to attenuate surface water run-off (e.g. SUDS, containment lagoon or similar), the use of drip trays beneath plant and/ or bunding of fuel or oil tanks and the use of double-skinned fuel or oil tanks to minimise the risk of spillage. These measures will be detailed in the CEMP, and a pollution plan will be prepared to deal with an

accidental pollution event. These are measures which are put in place as standard on similar construction projects and are not included here specifically to avoid an effect on the Humber Estuary.

10.6.35 It is reasonable to conclude that, with these measures in place, there is a negligible risk of surface water pollution to the Estuary during the construction phase. This is assessed as a neutral effect on the Humber Estuary SAC/ SPA/ Ramsar/ SSSI designated habitats, and the ecology features they support (waterbirds, sea lamprey, river lamprey and grey seal).

Loss of Semi-Improved Grassland During Construction

10.6.36 Approximately 6.7 ha of semi-improved grassland evaluated to be of District nature conservation value will be permanently lost to the Proposed Development at the start of construction. In the absence of mitigation, this is assessed to be a large impact because it will result in the irreversible loss of this habitat within the Main Development Area. This is assessed to give rise to a moderate adverse effect, which is significant.

Potential Effects on Aquatic Invertebrates During Construction

*Loss of Habitat due to Culvert Construction*

10.6.37 The Proposed Development will not directly affect Ditch 2, which had the greatest diversity of aquatic invertebrate species and was therefore evaluated to be of the highest nature conservation value (District) of those surveyed within the Site, or Ditch 1, which was evaluated to be of Local nature conservation value.

10.6.38 The installation of the culvert to facilitate access to the Main Development Area from South Marsh Road will result in direct impacts on approximately 8 – 10 m of Ditch 3, which runs along the northern boundary. This is assessed to be a negligible impact on the ditch, because it will not result in any substantial or extensive damage to the ditch, and as there are already culverted sections of this ditch, it will not reasonably change the habitats or assemblage of terrestrial invertebrate species present. This is assessed as giving rise to a negligible effect on Ditch 3.

*Surface Water Pollution*

10.6.39 As discussed above in respect of potential impacts on the Humber Estuary, the adoption of best practice construction methods will minimise the risk of surface water pollution to the ditches during the construction phase. There will also be an undeveloped buffer zone established along all ditches of at least 5 m, which will protect the ditches during construction. It is therefore assessed that there will be a negligible effect on the ditches as a result of surface water pollution during construction.

Potential Effects on Schedule 1 Nesting Birds During Construction – Peregrine Falcons

*Disturbance*

10.6.40 A pair of peregrine falcons was observed around the SHBPS during several surveys undertaken in summer 2018, and it is assumed that they nested there; anecdotal evidence from the Applicant indicates that they likely nest on SHBPS

most years. Given the proximity of the nesting location at SHBPS to the Main Development Area, there is the potential for disturbance to occur during the construction phase.

10.6.41 However peregrine falcons can be highly adapted to sites with human activity, such as the existing SHBPS. The species displays a high degree of nest-site fidelity and are likely to return to the same nesting location as in previous years. Given that this species is present in the existing industrial context of the SHBPS, it is reasonable to assume that the nesting pair would not be adversely affected by the movement of vehicles, plant and people during construction of the Proposed Development because this is a regular occurrence on the existing SHBPS site. No disturbance impacts are therefore considered likely, and the effect is assessed as negligible and not significant

Potential Effects on Water Vole During Construction

*Loss of Ditch Habitat due to Culvert Construction*

10.6.42 There will be a direct impact on the ditch running along the northern boundary of the Site (Ditch 3), but this will be limited to the installation of a short culvert (approximately 8 – 10 m) to facilitate vehicle access to the Proposed Development from South Marsh Road. The permanent loss of habitat resulting from this part of the Proposed Development will be minimal (the total length of this ditch is around 1 km). No other ditches would be directly affected.

10.6.43 The minor nature of the habitat loss in Ditch 3 would not reasonably result in any loss of water vole territories, or result in fragmentation or isolation of populations because individuals would still be able to access habitats on either side of the culvert. There are existing culverts on this ditch that are clearly not barriers to the movement of water voles throughout the ditch network. This impact is assessed as giving rise to a neutral effect on water voles.

10.6.44 In the absence of mitigation, there is a risk that water voles may be accidentally killed or injured during the construction works, and their burrows damaged or destroyed. Mitigation for this species will therefore be implemented for legislative compliance, and the works will be undertaken under the supervision of an ecologist holding a Natural England Class Licence for water voles.

*Damage to Ditch Habitat due to Construction*

10.6.45 Embedded mitigation in the design of the Proposed Development has incorporated a 5 m undeveloped buffer zone along the banks of all perimeter ditches to prevent damage and disturbance to water vole habitats. It is therefore reasonable to assume that water vole burrows would not be damaged by construction activities.

10.6.46 It may be necessary to undertake minor works within the 5 m buffer zone e.g. perimeter fence installation, but any such works would not require deep excavations, and would not reasonably be expected to result in damage to water vole burrows. The ditch banks are particularly steep-sided, and no water vole burrows were identified towards the tops of the banks; burrows are therefore likely to be further down the banks around the water level.

10.6.47 Measures to control the risk of surface water pollution that could result in damage to the riparian habitats supporting water voles e.g. as a result of siltation or a fuel spill, will be set out in the CEMP. A number of other embedded mitigation measures to avoid surface water impacts are set out in Chapter 14: Water Resources, Flood Risk and Drainage. With these measures in place, it is reasonable to conclude that there would be a negligible risk of contamination to the surface water of the ditches during construction.

*Accidental Killing or Injury*

10.6.48 In the absence of mitigation, there is a risk that water voles may be accidentally killed or injured during the works to install the culvert in Ditch 3. Mitigation for this species will therefore be implemented for legislative compliance, and the works will be undertaken under a Natural England licence.

10.6.49 It is considered that the minor extent of the works, and the likely small number of individual water voles affected, mean that displacement of water voles would be undertaken under the supervision of an ecologist holding a Natural England Class Licence for water voles, rather than triggering the requirement for a development-specific licence. This is discussed in Section 10.7 Mitigation.

*Noise and Visual Disturbance*

10.6.50 There is the potential for noise/ visual disturbance to water vole during the construction phase. However, given the industrial nature of the surrounding land use which includes an operational power station (SHBPS), chemical plant (to the north) and cooling water pumping station (to the east), it is reasonable to assume that water voles resident on ditches in this area would be habituated to current operational activity. Furthermore, the 5 m buffer along all ditches would limit the potential for any disturbance to water voles. It is assessed that construction disturbance would give rise to neutral effects on water voles.

<u>Potential Impacts on Otter During Construction</u>

*Loss of Ditch Habitat due to Culvert Construction*

10.6.51 As discussed above in respect of water vole, the minor loss of ditch habitat resulting from culverting of a short section of Ditch 3 for site access will not result in any impacts on otter. The culvert will not obstruct access to or fragment the ditch network, which already contains similar short culverted sections.

*Noise and Visual Disturbance*

10.6.52 There is the potential for noise/ visual disturbance to otter during the construction phase. This species is largely nocturnal and given that the majority of the works would be undertaken during daylight hours, it is unlikely that any otters would be present during construction activities as there is no suitable habitat cover for them to lie-up in. However, given the industrial nature of the surrounding land use which includes an operational power station (SHBPS), chemical plant (to the north) and cooling water pumping station (to the east), it is reasonable to assume that otters moving through ditches in this area would be habituated to current operational activity. It is assessed that construction activities would give rise to neutral effects on otter.

***Operation***

10.6.53 This section describes the impacts and potential effects during the operational and maintenance phase of the Proposed Development on relevant ecological features in the absence of any mitigation, over and above that which is inherent to the design.

10.6.54 To enable a proportionate impact assessment, screening was undertaken of potential impacts of the operational phase that are likely to result in adverse or beneficial effects on relevant ecological features and that require further impact assessment. The relevant impacts are taken forward in the more detailed impact assessment that follows. Those impacts that are considered unlikely to result in significant effects are scoped out and not considered further.

10.6.55 The following potential source-receptor pathways have been scoped out of the impact assessment:

- noise/ visual disturbance to Humber Estuary SPA/ Ramsar qualifying breeding bird species (bittern, marsh harrier, avocet and little tern) - there is no suitable habitat for the qualifying species of breeding birds within the potential zone of influence of noise and visual disturbance arising from the operation of the Proposed Development. There is therefore no pathway by which these features could be affected by the Proposed Development;
- visual disturbance to qualifying Humber Estuary SPA/ Ramsar wintering bird species feeding on mudflats – the nearest mudflats are approximately 175 m from the Proposed Development, and the cooling water pumping station and substantial flood embankment and seawall lies between the mudflats and the Proposed Development. The type and scale of buildings associated with the Proposed Development are not significantly different from those already present on the SHBPS site, and therefore there would be no discernible visual change in the baseline environment; and
- air quality impacts on intertidal and subtidal habitats in the Humber Estuary SAC/ SSSI – intertidal habitats are not susceptible to the effects of changes in air quality arising from stack emissions during operation (increased nitrogen and acid deposition) because of their regular tidal inundation. Subtidal habitats have similarly been scoped out.

10.6.56 Impacts during the operational period that have potential to result in significant effects on relevant ecological features, and which were screened into the impact assessment are considered further below:

- potential effects on Humber Estuary SAC/ SPA/ Ramsar/ SSSI (changes in air quality, noise and visual disturbance and surface water pollution);
- potential effects on Local Wildlife Sites (changes in air quality);
- potential effects on aquatic invertebrates (surface water pollution);
- potential effects on Schedule 1 breeding birds (disturbance);
- potential effects on water vole (noise and visual disturbance, surface water pollution to ditches); and

- potential effects on otter (noise and visual disturbance, surface water pollution to ditches).

Potential Effects on Humber Estuary SAC/ SPA/ Ramsar/ SSSI During Operation

*Air Quality Impacts on Habitats*

10.6.57 An air quality impact assessment has been undertaken and is presented in ES Chapter 7: Air Quality. The proposed stack heights are fixed at 102 m AOD to provide certainty to the assessment.

10.6.58 There are two measures of particular relevance when considering the potential for significant effects on habitats to result from changes in air quality arising from the Proposed Development. The first is the concentration of oxides of nitrogen (known as $NO_x$) in the atmosphere. The main importance is as a source of nitrogen (N), which is then deposited on adjacent habitats either directly (known as dry deposition, including directly onto the plants themselves) or washed out in rainfall (known as wet deposition). The deposited nitrogen can then have a range of effects, primarily growth stimulation or inhibition, but also biochemical and physiological effects such as changes to chlorophyll content. $NO_x$ may also have some effects which are un-related to its role in total nitrogen intake (such as the acidity of the gas potentially affecting lipid biosynthesis) but the evidence for these effects is limited and they do not appear to occur until high annual concentrations of $NO_x$ are reached.

10.6.59 The guideline atmospheric concentration of $NO_x$ advocated by Government for the protection of vegetation is 30 micrograms per cubic metre ($\mu gm^{-3}$), known as the Critical Level (Hall *et al*. 2006). This is driven by the role of $NO_x$ in N deposition and in particular in growth stimulation and inhibition. If the total $NO_x$ concentration in a given area is below the Critical Level, it is unlikely that N deposition will be an issue, unless there are other sources of nitrogen (e.g. ammonia). If it is above the Critical Level then local N deposition from $NO_x$ could be an issue and should be investigated.

10.6.60 The second important metric is a direct determination of the rate of the resulting N deposition, which is habitat specific because different habitats have varying tolerance to nitrogen. For many habitats there are measurable effects in the form of published dose-response relationships for N deposition, which do not exist for $NO_x$. Unlike $NO_x$, the N deposition rate below which current evidence suggests that effects should not arise is different for each habitat. The rate (known as the Critical Load) is provided on the UK Air Pollution Information System website (www.apis.ac.uk) and is expressed as a quantity (kilograms) of nitrogen over a given area (hectare) per year (kg N/ha/yr). More recently, there has also been research compiled that investigates N dose-response relationships in a range of habitats (Caporn *et al*. 2016).

10.6.61 For completeness, rates of acid deposition were also calculated. Acid deposition derives from both sulphur and nitrogen. It is expressed in terms of kiloequivalents (keq) per hectare per year. The thresholds against which acid deposition is assessed are referred to as the Critical Load Function.

10.6.62 The effects of elevated Hydrogen Fluoride (HF) emissions have been discounted from the assessment for ecological receptors on the basis that habitats are not sensitive to this type of pollutant.

**Nitrogen Oxides ($NO_x$)**

10.6.63 The air quality impact assessment has modelled a number of receptors within the Humber Estuary SAC/ SPA/ Ramsar/ SSSI that are sensitive to $NO_x$ emissions. The nearest to the Proposed Development is an area of saltmarsh habitat approximately 400 m south-east (receptors E1_1, E1_2 and E1_3 as shown on Figure 7.2 in ES Volume II (Document Ref. 6.3)). At these receptors, the process contribution resulting from the maximum annual mean $NO_x$ emissions is 2.4%, 2.4% and 2.5% respectively of the Critical Level for the Humber Estuary SAC/ SPA/ Ramsar. This therefore exceeds the screening threshold at which an adverse effect on the designated habitats (and therefore the species they support) may occur, and indicates that further assessment is required.

10.6.64 At this location, APIS data indicate that the background annual mean $NO_x$ concentration at these receptors is 25.9 µg/$m^3$. The process contribution from the Proposed Development, although greater than 1%, results in total $NO_x$ of 26.7 µg/$m^3$, which does not exceed the Critical Level for all vegetation types from the effects of $NO_x$ of 30 µg/$m^3$. As most of the reported concentration of $NO_x$ is due to the published background value used in the calculations, further analysis was undertaken using project-specific survey data, which concluded that the annual mean $NO_x$ process contribution would be 2.5% of the Critical Level, resulting in total annual mean $NO_x$ concentration of 18.6 µg/$m^3$.

**Nutrient Nitrogen (N) Deposition**

10.6.65 The air quality impact assessment has concluded that the annual N deposition rate (kg N/Ha/year) process contribution at the nearest saltmarsh habitat would be 2.1% of the Critical Load at receptors E1_1, E1_2 and E1_3. As this is above the 1% screening threshold, it is therefore necessary to examine the output from the modelling in greater detail to establish whether this elevation in N deposition would result in any significant effects on the saltmarsh habitat.

10.6.66 The total annual N deposition predicted at these three receptors is 0.4 kg N/ha/yr, resulting from NOx and ammonia ($NH_3$), compared to the background deposition of 15.5 kg N/ha/yr. With the Proposed Development there would therefore be no exceedance of the Critical Load for this habitat type, which is 20 – 30 kg N/ha/yr. It is therefore assessed that N deposition resulting from the Proposed Development will result in a neutral effect on the Humber Estuary SPA/ SAC/ Ramsar/ SSSI that is not significant.

**Acid Deposition**

10.6.67 For acid deposition (keq/Ha/year), the air quality impact assessment identified that there would be no exceedances of the 1% Critical Level screening threshold for potential adverse effects on sensitive habitat types within the Humber Estuary SAC/ SPA/ Ramsar/ SSSI. It is therefore concluded that there would be no significant effects on the Humber Estuary designated site as a result of acid deposition.

**Sulphur Dioxide ($SO_2$)**

10.6.68 For sulphur dioxide, the air quality impact assessment identified that there would be no exceedances of the 1% Critical Level screening threshold for potential adverse effects on sensitive habitat types within the Humber Estuary SAC/ SPA/ Ramsar/ SSSI. It is therefore concluded that there would be no significant effects on the Humber Estuary designated site as a result of $SO_2$ emissions from the Proposed Development.

*Air Quality Impacts on Habitats (Cumulative)*

10.6.69 A cumulative air quality impact assessment has been undertaken and a summary is presented in Chapter 17: Cumulative and Combined Effects in ES Volume I (Document Ref. 6.2).

*Surface Water Pollution to Habitats Supporting Marine Species*

10.6.70 Potential pollution (sediment or contaminants) arising from surface water run-off and treated foul drainage discharge from within the Site during operation will be controlled through the drainage design. This is set out in Chapter 14: Water Resources, Flood Risk and Drainage (ES Volume I, Document Ref. 6.2).

10.6.71 There is therefore no surface water pathway by which the Proposed Development could impact on the Humber Estuary SAC/ SPA/ Ramsar/ SSSI designated habitats, and the marine ecology features they support (sea lamprey, river lamprey and grey seal).

*Noise Disturbance to Qualifying SPA/ Ramsar Wintering Bird Assemblage at Pyewipe Mudflats*

10.6.72 Predicted operational noise levels at receptor R3 (at the edge of the Humber Estuary SPA/ Ramsar boundary) are 5 dB below the ambient noise level of 52 dB $L_{Aeq}$ during the worst case hour at night (06:00 – 07:00). This results in an increase in the ambient level at receptor R3 of no more than 1 dB, which is not significant.

10.6.73 With regards to $L_{AFmax}$ levels during operation of the Proposed Development, it is not expected that significant $L_{AFmax}$ events will occur at the Site which will be audible along the Humber Estuary. The activities that are likely to result in the highest $L_{AFmax}$ levels are the tipping of waste into the bunker when it is delivered and the placing of waste into the shredder. As these activities are undertaken within the enclosed fuel reception hall and fuel bunker parts of the building, which are located at the furthest point of the building from the Estuary, $L_{AFmax}$ levels from these activities are unlikely to be audible at the Estuary.

10.6.74 It is assessed that operational noise arising from the Proposed Development will result in a neutral effect on waterbirds feeding, roosting and loafing in the Pyewipe mudflats.

10.6.75 Noise associated with planned and unplanned outages and other maintenance activities, or operation of boiler safety valves or steam turbine bypass valves, has not been specifically modelled as part of the noise assessment presented in Chapter 8: Noise and Vibration, but noise from such activities (which do not include piling) are expected to be lower than construction noise effects, which are assessed in paragraphs 10.6.8 to 10.6.28 above.

*Noise Disturbance to Qualifying SPA/ Ramsar Wintering Bird Assemblage in Adjacent Fields to North*

10.6.76 At the nearest part of the northern fields to the Proposed Development operational noise is predicted to be up to 68 dB $L_{Aeq}$, which is above the ambient level for the 'worst case hour' between 06:00 and 07:00 (see Chapter 8: Noise and Vibration and the noise contours are shown on Figure 8.2 in ES Volume II (Document Ref. 6.3). However, as discussed above in respect of the assessment for construction noise, it is reasonable to assume that waterbirds using these fields would not be using habitats close to boundary features (due to the requirement for scanning distances for predator avoidance), and are therefore more likely to be orientated towards the middle of the fields. In the centre of fields 30 and 31, operational noise levels will have attenuated with distance to around 50 dB $L_{Aeq}$, which is similar to ambient levels. No displacement of waterbirds would therefore be anticipated.

10.6.77 Noise associated with the operation of the Proposed Development is therefore assessed as giving rise to a neutral effect on the qualifying wintering bird assemblage of the Humber Estuary SPA/ Ramsar using the functionally linked fields to the north (fields 30 and 31).

*Noise Disturbance to Qualifying SPA/ Ramsar Wintering Bird Assemblage in Adjacent Field to South*

10.6.78 At the nearest part of the southern field to the Proposed Development, operational noise is predicted to be up to 62 dB $L_{Aeq}$, which is above the ambient level. However, as discussed above in respect of the assessment for construction noise, it is reasonable to assume that waterbirds using the fields would not be using habitats close to boundary features (due to the requirement for scanning distances for predator avoidance), and are therefore more likely to be orientated towards the middle of the field. Towards the centre of field 37, operational noise levels will have attenuated to around 50 dB $L_{Aeq}$, which is similar to ambient levels. No displacement of waterbirds would therefore be anticipated.

10.6.79 Noise associated with the operation of the Proposed Development is therefore assessed as giving rise to a neutral effect on the qualifying wintering bird assemblage of the Humber Estuary SPA/ Ramsar using the functionally linked field to the south (field 37).

*Visual Disturbance to Qualifying Wintering Bird Assemblage in Adjacent Field to the South*

10.6.80 The nature and scale of the operational activities associated with the Proposed Development will be set against the backdrop of the SHBPS, and will therefore not represent a significant change in the type of structures already present in habitats adjacent to fields used by waterbirds. Regardless of this, it is difficult to predict with any degree of certainty what the response of waterbirds will be to changes in the visual environment. It is reasonable to assume that such birds are resilient to any changes that do not directly affect habitats within which they are feeding, roosting and loafing, because they are present in a dynamic and highly commercial environment associated with the busy Humber Estuary. This includes the presence of tall structures such as power stations, bulk handling

facilities, jetties and cranes, and the movement of large commercial vessels in and out of the nearby ports of Immingham and Grimsby.

10.6.81 It is therefore reasonable to assume that any SPA/ Ramsar waterbirds roosting/ loafing/ foraging in the field to the south of the Site are habituated to the industrial nature of the surrounding area such that they would not be disturbed by the presence of tall chimney structures and other buildings on adjacent land. As a general precaution the c.2.5 m high close-boarded fence along the southern border of the Site will be retained for the operational lifespan of the Proposed Development to reduce potential visual disturbance on wintering birds from ground level activities (operational traffic and staff). Visual impacts on waterbirds feeding, roosting and loafing in the adjacent field to the south are therefore assessed as giving rise to a neutral effect on the qualifying wintering bird assemblage of the Humber Estuary SPA/ Ramsar.

Potential Impacts on Local Wildlife Sites During Operation

*Air Quality Impacts*

10.6.82 The air quality impact assessment in Chapter 7: Air Quality has considered potential air quality impacts arising from emissions of pollutants from the Proposed Development on the non-statutory sites identified within 2 km of the Site, although there are no baseline data for these sites as there are for the statutory designated sites because they are not included on the APIS database. Various assumptions on the habitat types have therefore been made to inform the modelling process.

10.6.83 Of the local sites considered in the modelling, Stallingborough Fish Ponds LWS (E7), Healing Cress Beds LWS (E8) and Sweedale Croft Drain (E9) will be subject to cumulative Process Contributions (PCs) of NOx from all plans/ projects above the 1% screening threshold. When the Predicted Environmental Concentrations (PECs) for NOx at these three LWSs are examined in greater detail, at all three sites this results in an exceedance of the Critical Level. The cumulative N deposition PC will be 0.2 – 0.5 kg N/ha/yr and the total PEC will be 15.9 to 25 kg N/ha/yr. The contribution from the Proposed Development alone is 0.1 to 0.3 kg N/ha/yr, which is a relatively small increase in N deposition (i.e. less than 5% of the Critical Load). When considering high background deposition rates, this is assessed as a minor adverse effect on the LWSs that is not significant.

Potential Effects on Aquatic Invertebrates During Operation

*Surface Water Pollution*

10.6.84 Embedded mitigation in the drainage design to control surface water run-off during operation will ensure that there is negligible potential for any pollution to habitats that may be used by water vole. Similarly, discharge will be attenuated on site to greenfield run-off rates, and therefore there is no potential for any impacts on the water levels within the ditch. No impacts on ditch habitats or the aquatic invertebrates they support are predicted as a result of the operation of the Proposed Development.

*Foul Drainage*

10.6.85 Domestic foul drainage may be processed via an on-site package treatment plant that discharges to one of the surface water ditches in the Main Development Area and ultimately discharge to the Humber Estuary. The volume of processed discharge is not considered to represent a potential adverse effect on the ditch habitats of the species they support are predicted as a result of the operation of the Proposed Development.

Potential Effects on Schedule 1 Nesting Birds During Operation – Peregrine Falcon

*Disturbance*

10.6.86 During operation it is expected that disturbance levels, with respect to peregrine falcon, will return to the original baseline of disturbance from SHBPS, where the species has chosen to nest in previous years. It is likely that peregrine falcons (assuming they do return to SHBPS in future years) will become habituated to the operational Proposed Development, as currently observed at SHBPS. It is therefore assessed that operational activities will give rise to neutral effects upon peregrine falcon.

Potential Impacts on Water Vole During Operation

*Noise and Visual Disturbance*

10.6.87 There is the potential for noise/ visual disturbance to water vole during the operational phase. However, given the industrial nature of the surrounding land use which includes an operational power station (SHBPS), chemical plant (to the north) and cooling water pumping station (to the east), it is reasonable to assume that water voles resident on ditches in this area would be habituated to current operational activity. The 5 m undeveloped buffer zone will also minimise the risk of disturbance to water voles. It is assessed that operational activities would give rise to neutral effects on water voles.

*Surface Water Pollution to Ditches*

10.6.88 Embedded mitigation in the drainage design to control surface water run-off during operation will ensure that there is negligible potential for any pollution to habitats that may be used by water vole. Similarly, discharge will be attenuated on site to greenfield run-off rates, and therefore there is no potential for any impacts on the water levels within the ditch.

Potential Impacts on Otter During Operation

*Noise and Visual Disturbance*

10.6.89 There is the potential for noise/ visual disturbance to otter during the operational phase. As discussed above in respect of water vole, given the industrial nature of the surrounding land use which includes an operational power station (SHBPS), chemical plant (to the north) and cooling water pumping station (to the east), it is reasonable to assume that otters moving through ditches in this area would be habituated to current operational activity. It is assessed that operational activities would give rise to neutral effects on otter.

*Surface Water Pollution to Ditches*

10.6.90 Embedded mitigation in the drainage design to control surface water run-off during operation will ensure that there is negligible potential for any pollution to habitats that may be used by foraging/ passage otter. Similarly, discharge will be attenuated on site to greenfield run-off rates, and therefore there is no potential for any impacts on the water levels within the ditch.

***Decommissioning***

10.6.91 The extent of habitat loss that is likely to be required during decommissioning is likely to be much less than at construction (i.e. no further habitat loss), and the resulting effects on ecological features are therefore likely to be reduced. As described in Section 10.9, appropriate pre-works surveys and mitigation or impact avoidance measures will be implemented for the decommissioning phase as necessary.

10.6.92 In a number of cases impacts associated with the decommissioning phase of the Proposed Development are likely to be of a similar nature to those associated with the construction phase, because the decommissioning methodology will be of a similar impact level to that of construction in terms of noise, vibration, and air quality. As a result the potential effects on ecological features are not anticipated to differ significantly from those predicted at construction.

Comparison of Proposed Development and Consented Development

10.6.93 The impacts and effects of the the Proposed Development compared the impacts and effects of the Consented Development are described below.

***Construction***

10.6.94 Using the Rochdale Envelope approach, the EcIA for the Consented Development assumed that the whole of the Main Development Area would be cleared during the construction of the Consented Development. There would therefore be no additional loss of semi-improved grassland habitat within the Main Development Area (which is also functionally linked SPA water bird habitat) due to the Proposed Development.

10.6.95 The predicted noise/ vibration and visual disturbance impacts from construction of the Consented Development experienced at Pyewipe mudflats and fields used by SPA water birds to the north and south of the Main Development Area would be the same as the construction noise impacts predicted due to the Proposed Development, because the nature and duration of construction activities would be the same and the footprint of development would be very similar (see Figure 4.3 in ES Volume II, Document Ref. 6.3). There would therefore be no additional construction noise/ vibration or visual disturbance effects on Pyewipe mudflats, or fields to the north and south of the Main Development Area due to the construction of the Proposed Development.

10.6.96 As the nature and duration of construction activities, including good practice methods to control pollution, will be implemented for the Proposed Development as for the Consented Development, the construction of the Proposed Development would have no additional effects on habitats due to surface water pollution.

10.6.97 The ditch culvert required to create the access into the Main Development Area would be the same for the Consented Development or the Proposed Development, so the Proposed Development would have no additional effects on the ditch (terrestrial invertebrate assemblage or water voles) compared to the Consented Development. The culvert construction work will be undertaken under the supervision of an ecologist holding a Natural England Class Licence for water voles.

10.6.98 A 5 m buffer zone would be maintained along the banks of all ditches around the Main Development Area during the construction of either the Consented Development or the Proposed Development, so the Proposed Development would avoid effects on water vole in the same way as the Consented Development.

***Operation***

10.6.99 As set out in Chapter 7: Air Quality, the operational air emissions from the Proposed Development would be the same as the operational air emissions from the Consented Development, as the same amount of fuel would be combusted using the same methods. Air quality effects on habitats and designated sites due to the operation of the Proposed Development would be the same as the effects of the Consented Development's operation.

10.6.100 The noise and vibration impacts from the operation of the Proposed Development at the nearest sensitive ecological receptors (Pyewipe mudflats, and fields to the north and south of the Main Development that are used by water birds) would be the same as the noise and vibration impacts on these receptors from the operation of the Consented Development, because the nature of the operation and operational traffic flows would be the same, and the scale and layout of the operational development would be very similar. Similarly, visual disturbance of water birds using the fields to the south of the Main Development Area would also be the same for either the Consented Development or the Proposed Development, and a 2.5 m visual screen would be provided as part of either development.

10.6.101 The operation of the Proposed Development would cause no additional disturbance of water voles or otter using ditches around the Site compared to the operation of the Consented Development (the effect for either development is assessed to be neutral).

10.6.102 The Proposed Development would also introduce no additional surface water pollution impacts on habitats compared to the Consented Development, as appropriate drainage and pollution control measures will be implemented for either development.

***Decommissioning***

10.6.103 The scale and nature of the Proposed Development is so similar to the Consented Development that the decommissioning effects on ecological receptors would be the same for either development. Appropriate surveys would be undertaken prior to decommissioning to ensure any necessary mitigation or impact avoidance measures are identified and implemented.

## 10.7 Mitigation and Enhancement Measures

10.7.1 The mitigation and enhancement measures described below are also set out in the Biodiversity Strategy (Document Ref. 5.11), which includes the Biodiversity Protection Plan and the Indicative Biodiversity Mitigation and Enhancement Plan. The mitigation and enhancement measures will be secured by requirements in Schedule 2 of the DCO.

Humber Estuary SPA/ Ramsar Mitigation (Piling Noise and Vibration)

10.7.2 The assessment has concluded that there is the potential for significant adverse effects on waterbirds in the adjacent field to the south (field 37), which is functionally linked to the Humber Estuary SPA/ Ramsar, as a result of piling noise and vibration during construction. Although the piling activity will only be undertaken for a relatively short period of time (estimated at 2 to 4 months), it is not possible at this stage to determine whether this will overlap with the sensitive wintering bird period. It may therefore occur when birds are present and they could be disturbed or displaced.

10.7.3 At this stage, the mitigation measures to be employed have not been fixed; this is to enable sufficient flexibility for the contractor to determine the best available technique for noise abatement during piling works. For the purposes of this EcIA, it is assumed that mitigation will comprise:

- seasonal piling restrictions – piling will be restricted for two hours either side of high tide in the period September to March inclusive, to avoid the most sensitive winter months, and the time period when birds are most likely to be present in the fields (i.e. when they are pushed off the coastal mudflats at high tide); and/ or
- Continuous Flight Auger (CFA) piling – this technique is virtually vibration free, and one of the quietest forms of piling. . If this technique is adopted, it will be possible to reduce construction noise reaching the fields to within ambient levels, and vibration disturbance effects would also be reduced.

Biodiversity Protection Plan

*Water Vole Mitigation*

10.7.4 Works to install the culvert on Ditch 3 will be undertaken under the supervision of an ecologist holding a Class Licence for water vole. This is due to the minor extent of the works (approximately 8 – 10m) that does not trigger the requirement for a development licence from Natural England. A separate water vole mitigation strategy document will be prepared as part of the Class Licence process; however, the approach and timings are outlined below.

10.7.5 The approach to mitigation will be as follows:

- ditch vegetation (within the channel and on the banks) will be strimmed back to ground level under the supervision of the Class Licensed ecologist to displace water voles from the affected section of habitat in the period 15th February to 15th April;
- ditch vegetation will be kept strimmed short until works commence;

- arisings will be removed;
- prior to the commencement of works, the Class Licensed ecologist will inspect the working area to confirm that water voles were absent from any burrows present;
- on confirmation of the absence of water voles, works to install the culvert will commence under the supervision of the Class Licensed ecologist; and
- any amphibians (e.g. common toad) encountered during the works will be moved to a place of safety away from the working area (likely to be in close proximity to a nearby ditch) by the supervising ecologist).

10.7.6 This mitigation approach will also be sufficient to address the risk of accidental killing/ injury to water shrew (*Neomys fodiens*), which may be present in the perimeter ditches see Appendix 10E: Otter and Water Vole Survey Report in ES Volume III (Document Ref. 6.4).

*Grass Snake Mitigation*

10.7.7 Due to the potential for grass snake to occur on the banks of ditches, a precautionary approach to the clearance of vegetation will be undertaken (alongside the mitigation for water vole). The strimming of vegetation from the banks of Ditch 3 for water vole displacement will also be sufficient to displace grass snake.

*Breeding Bird Mitigation*

10.7.8 The removal of the marginal vegetation from the affected sections of ditch will be timed to ensure that there is no risk of breeding birds nesting in the vegetation prior to works commencing.

10.7.9 Grassland and marginal ditch vegetation will be removed outside the breeding bird season wherever possible. If this is not possible and vegetation removal is required during the breeding bird season, then a pre-works check for nests will be undertaken and appropriate mitigation will be implemented to avoid disturbance.

Indicative Biodiversity Mitigation and Enhancement Plan

10.7.10 The Indicative Biodiversity Mitigation and Enhancement Plan is presented within the Biodiversity Strategy (Document Ref. 5.11). A final Biodiversity Mitigation and Enhancement Plan will be agreed in accordance with a DCO requirement. An area of land has been set aside within the Site for ecological mitigation and biodiversity enhancements to the west of the SHBPS (see Figure 4.2 in ES Volume II (Document Ref. 6.3)).

10.7.11 The Biodiversity Mitigation and Enhancement Plan (see the Indicative Biodiversity Mitigation and Enhancement Plan in the Biodiversity Strategy, Document Ref. 5.11) will include details on:

- grassland mitigation (location and detailed planting specification);
- new pond creation (including detailed pond design, location and planting specification);

- species-rich hedgerow creation;
- enhancement of existing ditch habitat;
- the location and construction specifications for log pile refuges and bird nest boxes;
- appropriate management of the habitats including the newly created grassland and new pond;
- habitat monitoring (including targets and thresholds for remedial action); and
- timetables and responsibilities for undertaking the above tasks.

*Grassland Mitigation*

10.7.12 An area of species-rich grassland will be created to the west of the SHBPS, in an area that currently comprises short mown amenity grassland. This will offset some of the losses of semi-improved grassland within the footprint of the Main Development Area. Creation and management of the habitat is described in the Biodiversity Strategy (Document Ref. 5.11) and will be further detailed in the final Biodiversity Mitigation and Enhancement Plan, in accordance with a DCO requirement.

10.7.13 The initial post-completion and establishment period will be for five years, and the grassland will be monitored once every other year (commencing one year after planting) to determine whether any management intervention is required (e.g. targeted weed removal, follow-up seeding with wildflower mix, greater frequency of mowing etc.).

10.7.14 Areas of rough grassland will be created within this area with a litter layer to encourage small mammals for bird of prey foraging.

*Pond Creation*

10.7.15 A new wildlife pond will be created in the area of amenity grassland to the west of the existing SHBPS with surrounding tall marginal vegetation and areas of uncut semi-improved neutral grassland providing connectivity through semi-natural habitat to nearby broadleaved woodland and native hedgerow.

10.7.16 The pond will be designed with a non-uniform margin and varying depths to maximise the habitat niches available for aquatic plants, invertebrates, reptiles and amphibians.

10.7.17 The margins of the pond will be planted with a small amount of native aquatic and marginal plant species to assist with the establishment of vegetation, but will be primarily allowed to establish naturally.

10.7.18 An appropriate management plan for the new pond will be developed and implemented post-completion of the pond. This is described in the Biodiversity Strategy (Document Ref. 5.11) and will be further detailed in the final Biodiversity Mitigation and Enhancement Plan. The initial post-completion and establishment period will be for five years, and the pond will be monitored annually in September during this period to determine whether any management intervention (e.g. targeted reed clearance to maintain open water, removal of leaf litter etc.).

*Species-Rich Hedgerow Creation*

10.7.19 A species-rich native hedgerow will be created along the boundary of grassland to be botanically enhanced at the west of the SHBPS.

*Ditch Habitat Enhancement*

10.7.20 Existing ditches at the boundaries of the Site will be managed to provide enhanced habitat for water vole. Management specifications will include:

- leaving all ditch bank and marginal vegetation uncut between March and the end of September;
- allow tall marginal bank vegetation on at least one side of the ditch to persist throughout the year (rotational cutting regime);
- widening marginal habitat alongside the ditches where possible i.e. allowing the existing grassland and marginal vegetation to grow taller to provide a wider marginal corridor (to between 2-5 m along either side of the ditch; dependent on constraints of vehicle access tracks at the west of SHBPS); and
- allowing greater cover of floating and submerged aquatic plants to establish within the ditch

10.7.21 In response to Section 42 consultation comments from Natural England it is also proposed to widen a section of ditch and marginal vegetation to the south-east of SHBPS. Here, there is a small area of low-lying ground with sparse vegetation close to the ditch. This area has previously been recorded as supporting swamp habitat and is likely to be regularly inundated. This section of the ditch margin will be further excavated to increase its depth and allow water to flood into it permanently; extending the area of open water and providing potential for a diverse assemblage of submerged, floating-leaved and emergent aquatic vegetation to establish. Works to increase the depth of the ditch will be carried out in accordance with mitigation measures in line with those outlined for water vole mitigation during the construction of the culvert over the ditch in the north of the Main Development Area described at paragraph 10.7.8 above.

10.7.22 The ditch enhancement measures are set out in the Biodiversity Strategy (Document Ref. 5.11) and will be further detailed in the final Biodiversity Mitigation and Enhancement Plan.

*Additional Biodiversity Enhancements*

10.7.23 Details of additional biodiversity enhancement measures are described in the Biodiversity Strategy and will be detailed in the final Biodiversity Mitigation and Enhancement Plan. The following habitat enhancements will be delivered:

- creation of log pile refuges in the ecological mitigation and enhancement area to create ecological niches for reptiles, amphibians and terrestrial invertebrates; and
- installation of bird nest boxes on mature trees to the west and south-west of the SHBPS.

## 10.8 Limitations or Difficulties

10.8.1 Any limitations to the collection of field survey data are identified in the relevant technical appendices.

10.8.2 No significant limitations to the completion of this ecological impact assessment were identified.

## 10.9 Residual Effects and Conclusions

Construction

10.9.1 Where effects on ecology features scoped into the EcIA were assessed as significant before mitigation, and/ or mitigation has subsequently been proposed in Section 10.7 above to reduce the magnitude of impacts, the residual effects have been assessed below.

*Residual Effects on Humber Estuary SAC/ SPA/ Ramsar/ SSSI*

**Air Quality**

10.9.2 The EcIA predicts that the Proposed Development will give rise to no residual significant adverse air quality effects on sensitive habitats within the Humber Estuary SPA/ SAC/ Ramsar/ SSSI.

**Noise/ Vibration Disturbance**

10.9.3 No residual significant adverse effects on waterbirds feeding, roosting and loafing on Pyewipe mudflats within the Humber Estuary SPA/ Ramsar are predicted given the distance of the construction works from the mudflats, and the noise screening provided by the substantial flood defence embankment.

10.9.4 With mitigation, piling noise and vibration during construction will be reduced to within ambient levels (e.g. through seasonal restrictions or the use of CFA piling) in the field to the south of the Proposed Development that is considered to be also functionally linked to the Humber Estuary SPA/ Ramsar. Residual effects on waterbirds in this field, and thus the Humber Estuary, are therefore predicted to be minor adverse and not significant.

**Surface Water Pollution**

10.9.5 Embedded mitigation and compliance with the CEMP during construction will minimise the risk of pollution to the surrounding ditch network, and residual effects on the Humber Estuary are therefore assessed as neutral and not significant.

*Residual Effects on Semi-Improved Grassland*

10.9.6 Approximately 1 ha of species-rich grassland will be created and managed in the ecological mitigation and enhancement area to the west of the SHBPS, to mitigate for losses of this habitat within the Main Development Area. The area will be planted with a species-rich wildflower/ grassland seed mix and will aim to improve the biodiversity of the grassland habitat within the Site, and be of higher ecological value than the area of semi-improved grassland habitat lost to the Proposed Development.

10.9.7 Although mitigation for the loss of grassland habitat will be delivered, there is insufficient space within the Site boundary for like-for-like replacement. There will therefore be a net loss of this habitat within Site, although the creation and management of a more species-rich grassland than that lost will partially offset any impacts on the overall biodiversity of the Site. The residual effect on grassland habitats is therefore predicted to be minor adverse and not significant.

*Residual Effects on Water Vole*

10.9.8 The majority of water vole habitats identified on the Site are outside the Main Development Area boundary and will therefore not be directly affected. Embedded mitigation to control surface water run-off will ensure that the ditch habitats are not damaged during construction works.

10.9.9 Mitigation to address the low risk of killing/ injury during works to install a culvert on Ditch 3 will provide legislative compliance for this species in respect of the Wildlife and Countryside Act 1981. No significant residual effects on water vole are therefore anticipated.

Operation

10.9.10 No significant effects on ecology features have been predicated within this EcIA, and therefore it is concluded that the Proposed Development will not give rise to any significant adverse operational effects on ecology features including the Humber Estuary SAC/ SPA/ Ramsar/ SSSI.

Conclusions

10.9.11 The loss of functionally linked habitat to the Humber Estuary SPA/ Ramsar within the footprint of the Proposed Development will be addressed through the adoption of Policy 9 of the Local Plan to deliver alternative habitat for feeding, roosting and loafing birds via the SHG strategic mitigation pathway. The Cress Marsh habitat mitigation site has been completed and NELC has confirmed that it is attracting the target bird species.

10.9.12 Embedded mitigation to control surface water pollution during construction and operation means that there will be no adverse effects on the coastal and marine habitats of the Humber Estuary SAC/ SPA/ Ramsar/ SSSI. Mitigation for noise/ vibration and visual effects during construction will be employed to ensure that there is no disturbance to waterbirds in adjacent fields that are functionally linked to the Humber SPA/ Ramsar. A report to inform HRA for the Proposed Development has therefore concluded that there will be no adverse effects on the integrity of the Humber Estuary SAC/ SPA/ Ramsar (see HRA Signposting Report (Document Ref. 5.8).

10.9.13 Habitats within the Main Development Area were found to support breeding birds, water vole and otter, and were assumed to support grass snake due to the suitability of the habitat. Mitigation for these species will be employed during construction to avoid killing/ injury and to ensure legislative compliance in respect of the Wildlife and Countryside Act 1981. This assessment has therefore predicted that there will be no significant residual adverse effects on these species.

10.9.14 The loss of semi-improved grassland within the Main Development Area will be mitigated through the delivery of replacement, higher quality, habitats in the ecological mitigation and enhancement area to the west of the SHBPS. No significant residual adverse effects on habitats as a result of the Proposed Development are therefore anticipated.

## 10.10 References

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