

REPORT

Boston Alternative Energy Facility – Preliminary Environmental Information Report

Chapter 12 Terrestrial Ecology

Client: Alternative Use Boston Projects Ltd

Reference: PB6934-RHD-01-ZZ-RP-N-2012

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Project Related



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Non-Technical Summary

This chapter of the PEIR assesses the potential impacts of the Facility on terrestrial ecology. The baseline (existing) environment is described, and has been informed through a desktop study, consultation with stakeholders and on-site surveys.

All potential impacts during construction and operation of the Facility are identified and significance assessed.

The key ecological considerations and in turn the potential construction and operational related impacts are:

- 1 Permanent loss of terrestrial habitats;
- 2 Loss of foraging and commuting bats;
- 3 Displacement of common reptile species; and
- 4 Loss of habitats;
- 5 Indirect impacts from lighting and noise to bat and common bird species populations; and
- 6 Disturbance effects on species from maintenance activities.

Mitigation has been applied to the Ecological Impact Assessment (EIA) for both the construction and operational phase, in order to reduce the significance of some impacts. These mitigation measures will be secured through the adherence to an Ecological Management Plan during the construction phase of the Facility.

12 Terrestrial Ecology

12.1 Introduction

12.1.1 This chapter of the Preliminary Environmental Information Report (PEIR) describes the existing environment in relation to Terrestrial Ecology and provides the assessment of the potential impacts during the construction, operational and decommissioning phases of the Boston Alternative Energy Facility (the Facility) Application Site. Mitigation measures are identified and where appropriate a discussion of the residual impacts is provided where significant impacts have been identified.

12.1.2 This chapter is supported by the following appendix:

- Updated Ecology Report

12.1.3 This chapter describes the baseline environmental information which is of relevance to Terrestrial Ecology for the Application Site and identifies the construction, operational and decommissioning activities which could have an adverse impact on Terrestrial Ecology.

12.2 Legislation, Policy and Guidance

Legislation

12.2.1 There are various pieces of legislation applicable to Terrestrial Ecology. The following sections provide a summary of key pieces of International and UK legislation which are relevant to this chapter.

Habitats Directive – Council Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Fauna and Flora

12.2.2 This Directive provides protection for specific habitats listed in Annex I and species listed in Annex II of the Directive. The Directive sets out decision making procedures for the protection of Special Areas of Conservation (SAC) and Special Protection Areas (SPA), implemented in the UK through The Conservation of Habitats and Species Regulations 2017.

Wildlife and Countryside Act 1981 (as amended)

12.2.3 This Act makes it an offence (with exception to species listed in Schedule 2 and with additional penalties for species listed in Schedule 1) to intentionally: kill, injure, or take any wild bird; take, damage or destroy the nest of any wild bird while that nest is in use or being built; and take or destroy an egg of any wild bird.

- 12.2.4 The Act makes it an offence to intentionally kill, injure or take any animal listed in Schedule 5 of the act and protects occupied and unoccupied places used for shelter or protection.
- 12.2.5 The Act makes it an offence (subject to exceptions) to intentionally pick, uproot or destroy any wild plant listed in Schedule 8 of the Act.
- 12.2.6 The Act makes it a criminal offence to plant or otherwise cause to grow any non-native, invasive species listed under Schedule 9 of the Act.
- 12.2.7 The Act makes provision for the notification and confirmation of Sites of Special Scientific Interest (SSSI).

The Conservation of Habitats and Species Regulations 2017

- 12.2.8 The Regulations transpose the Council Directive 92 / 43 / EEC the 'Habitats Directive' in national law (in respect of England and Wales) and requires the state to designate SACs.
- 12.2.9 The Regulations make it an offence (subject to exceptions) to deliberately capture, kill, disturb, or trade in the animals listed in Schedule 2, or pick, collect, cut, uproot, destroy, or trade in the plants listed in Schedule 4.
- 12.2.10 The Regulations require competent authorities to consider or review planning permission, applied for or granted, affecting a European site, and, subject to certain exceptions, restrict or revoke permissions where the integrity of the site would be adversely affected.

The Protection of Badgers Act 1992

- 12.2.11 The Act makes it an offence to wilfully kill, injure or take, or attempt to kill, injure or take a badger *Meles meles*; and to cruelly ill-treat a badger.
- 12.2.12 The Act makes it an offence to intentionally or recklessly damage, destroy or obstruct a badger sett, or to disturb a badger whilst in a sett.

Natural Environment and Rural Communities (NERC) Act 2006

- 12.2.13 Section 41 of the Act requires the Secretary of State (SoS) to compile a list of habitats and species of principal importance for the conservation of biodiversity in England (herein 'S41 species').
- 12.2.14 Decision makers of public bodies, in the execution of their duties, must have regard to the conservation of biodiversity in England, and the list is intended to guide them.

The Hedgerow Regulations 1997

12.2.15 The Regulations make it an offence to remove or destroy certain hedgerows without permission from the local planning authority and the local planning authority is the enforcement body for such offences.

The Commons Act 2006

12.2.16 The Act aims to protect areas of common land, in a sustainable manner delivering benefits for farming, public access and biodiversity (Department for Environment, Food and Rural Affairs (Defra), 2013).

Countryside and Rights of Way Act 2000 (CRoW)

12.2.17 The Act amends the law relating to public rights of way including making provision for public access on foot to certain types of land. Amendments are made in relation to SSSIs to improve their management and protection, as well as to the Wildlife and Countryside Act 1981, to strengthen the legal protection for threatened species. Provision is also made for Areas of Outstanding Natural Beauty (AONB) to improve their management.

National Planning Policy

National Planning Policy Framework (NPPF)

12.2.18 The NPPF, published in 2019 replaces the former series of Planning Policy Statements. From its outset, the document makes plain that it is concerned with Sustainable Development, and paragraph 8 states that there are three dimensions to sustainable development: economic, social and environmental, and that all three are mutually dependent and gains for all should be sought jointly and simultaneously through the planning system. The environmental dimension is defined (as per the framework document) below:

“an environmental objective – to contribute to protecting and enhancing our natural, built and historic environment; including making effective use of land, helping to improve biodiversity, using natural resources prudently, minimising waste and pollution, and mitigating and adapting to climate change, including moving to a low carbon economy”.

Natural Environment White Paper 2011

12.2.19 The paper was the first White Paper produced by the government in 20 years. The paper contains plans to reconnect nature, connect people and nature for better quality of life and capture and improve the value of nature.

Biodiversity 2020: A Strategy for England's wildlife and ecosystem services

12.2.20 The Strategy sets out how England will implement the 2010 Aichi Biodiversity Targets, European Commission's 2011 EU Biodiversity Strategy and the recommendations of the 2011 Natural Environment White Paper. It contains the following relevant targets:

- Better wildlife habitats with 90% of priority habitats in favourable or recovering condition and at least 50% of SSSIs in favourable condition, while maintain at least 95% in favourable or recovering condition;
- More, bigger and less fragmented areas for wildlife, with no net loss of priority habitat and an increase in the overall extent of priority habitats by at least 200,000ha;
- By 2020, at least 17% of land and inland water, especially areas of particular importance for biodiversity and ecosystem services, conserved through effective, integrated and joined up approaches to safeguard biodiversity and ecosystem services including thorough management of our existing systems of protected areas and the establishment of nature improvement areas;
- Restoring at least 15% of degraded ecosystems as a contribution to climate change mitigation and adaptation;
- By 2020, we will see an overall improvement in the status of our wildlife and will have prevented further human-induced extinctions of known threatened species; and
- By 2020, significantly more people will be engaged in biodiversity issues, aware of its value and taking positive action.

National Policy Statements

12.2.21 The assessment of potential impacts upon Terrestrial Ecology has been made with specific reference to the relevant National Policy Statements (NPS). These are the principal decision-making documents for NSIPs. Those relevant to the project are:

- Overarching NPS for Energy (EN-1) (Department of Energy and Climate Change (DECC), 2011a); and
- NPS for Renewable Energy Infrastructure (EN-3) (DECC, 2011b).

12.2.22 The specific assessment requirements for Terrestrial Ecology, as detailed in the NPSs, are summarised in **Table 12.1**, together with an indication of the paragraph numbers of the PEIR chapter where each is addressed. Where any part of the NPS has not been followed within the assessment, an explanation as to why the

requirement was not deemed relevant, or has been met in another manner, is provided.

Table 12.1 NPS Assessment Requirements

NPS Requirement	NPS Reference	PEIR Reference
EN-1 Overarching NPS for Energy		
'Where the development is subject to EIA (Environmental Impact Assessment) the applicant should ensure that the ES (Environmental Statement) clearly sets out any effects on internationally, nationally and locally designated sites of ecological or geological conservation importance, on protected species and on habitats and other species identified as being of principal importance for the conservation of biodiversity. The applicant should provide environmental information proportionate to the infrastructure where EIA is not required to help the Infrastructure Planning Commission (IPC) consider thoroughly the potential effects of a proposed project.'	Section 5.3.3	Existing environment is discussed in Section 12.6 .
'The applicant should show how the project has taken advantage of opportunities to conserve and enhance biodiversity and geological conservation interests.'	Section 5.3.4	Embedded mitigation measures are presented in Section 12.6 .
'When considering the application, the IPC will have regard to the Government's biodiversity strategy as set out in 'Working with the grain of nature', which aims to halt or reverse declines in priority habitats and species; accept the importance of biodiversity to quality of life. The IPC will consider this in relation to the context of climate change. As a general principle, and subject to the specific policies below, development should aim to avoid significant harm to biodiversity and geological conservation interests, including through mitigation and consideration of reasonable alternatives (as set out in section 4.4 above); where significant harm cannot be avoided, then appropriate compensation measures should be sought. In taking decisions, the IPC should ensure that appropriate weight is attached to designated sites of international, national and local importance; protected species; habitats and other species of principal importance for the conservation of biodiversity; and to biodiversity and geological interests within the wider environment.'	Sections 5.3.5 – 5.3.8	Embedded mitigation measures are presented in Section 12.6 .
'The IPC will have the same regard to potential Special Protection Areas (pSPAs) and Ramsar sites as those sites identified through international conventions and European Directives.'	Section 5.3.9	Designated sites are discussed in Section 12.6 . Assessment is set out in Section 12.4 .

NPS Requirement	NPS Reference	PEIR Reference
		Site selection decisions have been made to avoid interest features at designated sites.
'Many SSSIs are also designated as sites of international importance and will be protected accordingly. Those that are not, or those features of SSSIs not covered by an international designation, should be given a high degree of protection.'	Section 5.3.11	Designated sites are discussed in Section 12.6 . Assessment is set out in Section 12.4 . Site selection decisions have been made to avoid interest features at designated sites.
'Where a proposed development on land within or outside an SSSI is likely to have an adverse effect on an SSSI (either individually or in combination with other developments), development consent should not normally be granted. Where an adverse effect, after mitigation, on the site's notified special interest features is likely, an exception should only be made where the benefits (including need) of the development at this site, clearly outweigh both the impacts that it is likely to have on the features of the site that make it of special scientific interest and any broader impacts on the national network of SSSIs.'	Section 5.3.13	Designated sites are discussed in Section 12.6 . Assessment is set out in Section 12.4 . Site selection decisions have been made to avoid interest features at designated sites.
'The IPC will have regard to sites of regional and local biodiversity and geological interest, which include Regionally Important Geological Sites, Local Nature Reserves and Local Sites when considering applications since they are recognised to have a fundamental role in meeting overall national biodiversity targets.'	Section 5.3.13	Regionally Important Geological Sites are discussed in Chapter 11 Contaminated Land, Land Use and Hydrogeology . Designated sites for their biodiversity interests are discussed in Section 12.6 . Assessment of biodiversity designated sites is set out in Sections 12.4 and 12.5 . Site selection decisions have been made to avoid interest features at designated sites.
'Ancient woodland is a valuable biodiversity resource both for its diversity of species and for its longevity as woodland. Once lost it cannot be recreated. The IPC should not grant development consent for any development that would result in its loss or deterioration unless the benefits (including	Section 5.3.14	There is no ancient woodland within or adjacent to the application site, therefore no further requirements are needed.

NPS Requirement	NPS Reference	PEIR Reference
<p>need) of the development, in that location outweigh the loss of the woodland habitat. Aged or ‘veteran’ trees found outside ancient woodland are also particularly valuable for biodiversity and their loss should be avoided. Where such trees would be affected by development proposals the applicant should set out proposals for their conservation or, where their loss is unavoidable, the reasons why.'</p>		<p>Site selection decisions have been made to avoid interest features such as trees wherever possible.</p>
<p>The IPC will aim to maximise opportunities to build in beneficial biodiversity features when considering proposals as part of good design.</p>	Section 5.3.15	<p>Embedded mitigation measures are presented in Section 12.6. This includes replanting and reinstatement of habitat where considered necessary. Further information regarding reinstatement and landscape mitigation planting is presented in Chapter 9 Landscape and Visual Impact Assessment.</p>
<p>The IPC shall have regard to the protection of legally protected species and habitats and species of principal importance for nature conservation.</p> <p>‘The IPC shall refuse consent where harm to the habitats or species and their habitats would result, unless the benefits (including need) of the development outweigh that harm. In this context the IPC should give substantial weight to any such harm to the detriment of biodiversity features of national or regional importance which it considers may result from a proposed development.’</p>	Sections 5.3.16 – 5.3.17	<p>Protected and important species and habitats is discussed in Section 12.6. Assessment is set out in Sections 12.4 and 12.5.</p>
<p>The applicant should include appropriate mitigation measures as an integral part of the proposed development and demonstrate that:</p> <ul style="list-style-type: none"> • During construction, they will seek to ensure that activities will be confined to the minimum areas required for the works; • During construction and operation best practice will be followed to ensure that risk of disturbance or damage to species or habitats is minimised, including as a consequence of transport access arrangements; • Habitats will, where practicable, be restored after construction works have finished; and • Opportunities will be taken to enhance existing habitats and, where practicable, 	Section 5.3.18	<p>Embedded mitigation measures are presented in Section 12.6. This includes replanting and reinstatement of habitat where considered necessary.</p>

NPS Requirement	NPS Reference	PEIR Reference
to create new habitats of value within the site landscaping proposals.		
'The IPC will need to take account of what mitigation measures may have been agreed between the applicant and Natural England has granted or refused or intends to grant or refuse, any relevant licences, including protected species mitigation licences.'	Section 5.3.20	Embedded mitigation measures are presented in Section 12.6 . Consultation/liaison with Natural England are presented in Section 12.3 .
EN-3 NPS for Renewable Energy Infrastructure		
'Proposals for renewable energy infrastructure should demonstrate good design in respect of landscape and visual amenity, and in the design of the project to mitigate impacts such as noise and effects on ecology.'	Section 2.4.2	Project design has avoided sensitive features where possible. Embedded mitigation measures are presented in Section 12.6 . See also Chapter 9 Landscape and Visual Impact Assessment .
'Ecological monitoring is likely to be appropriate during the construction and operational phases to identify the actual impact so that, where appropriate, adverse effects can then be mitigated and to enable further useful information to be published relevant to future projects.'	Section 2.6.70	Monitoring is discussed in mitigation set out in Section 12.6 .
'There may be some instances where it would be more harmful to the ecology of the site to remove elements of the development, such as the access tracks or underground cabling, than to retain them.'	Section 2.7.15	Decommissioning is discussed in Section 12.6 .

Local Planning Policy

12.2.23 EN-1 states, in paragraph 4.1.5 that:

- "Other matters that the IPC (now the Planning Inspectorate) may consider important and relevant to its decision-making may include Development Plan Documents or other documents in the Local Development Framework. In the event of a conflict between these or any other documents and an NPS, the NPS prevails for the purposes of IPC decision making given the national significance of the infrastructure."

12.2.24 The project infrastructure falls within the following local authority boundaries:

- Lincolnshire County Council (LCC); and
- Boston Borough Council (BBC).

12.2.25 **Table 12.2** provides details of the local planning policy documents and the relevant policies in respect of Terrestrial Ecology. Designated areas which these

policies may refer to are shown in **Figure 12.2**. Several policies which primarily relate to the management of water resources, and which are inter-linked with Terrestrial Ecology are discussed in **Chapter 13 Surface Water, Flood Risk and Drainage Strategy** and **Chapter 9 Landscape and Visual Impact Assessment**.

Table 12.2 Relevant Local Planning Policies

Document	Policy / Guidance	Policy / Guidance purpose
South-East Lincolnshire Joint Strategic Planning Committee		
South-East Lincolnshire Local Plan	Policy 28	<ul style="list-style-type: none"> • development proposals that would cause harm to these assets (internationally designated sites, on land or at sea) will not be permitted, except in exceptional circumstances, where imperative reasons of overriding public interest exist, and the loss will be compensated by the creation of sites of equal or greater nature conservation value. • a development proposal that would directly or indirectly adversely affect nationally or locally-designated sites (including Havenside Local Nature Reserve (LNR)) will not be permitted unless there are no alternative sites that would cause less or no harm; the benefits of the development at the proposed site, clearly outweigh the adverse impacts on the features of the site and the wider network of natural habitats; and suitable prevention, mitigation and compensation measures are provided. • Addressing gaps in the ecological network: by ensuring that all development proposals shall provide an overall net gain in biodiversity, by: <ul style="list-style-type: none"> ○ protecting the biodiversity value of land, buildings and trees (including veteran trees) minimising the fragmentation of habitats; ○ maximising the opportunities for restoration, enhancement and connection of natural habitats and species of principal importance; ○ incorporating beneficial biodiversity conservation

Document	Policy / Guidance	Policy / Guidance purpose
		features on buildings, where appropriate; and maximising opportunities to enhance green infrastructure and ecological corridors, including water space; and <ul style="list-style-type: none"> ○ conserving or enhancing biodiversity or geodiversity conservation features that will provide new habitat and help wildlife to adapt to climate change, and if the development is within a Nature Improvement Area (NIA), contributing to the aims and objectives of the NIA.
Lincolnshire County Council		
Lincolnshire County Council's Environmental Policy (2007)	Natural, Historic and Built Environment	Encourage wildlife and increase biodiversity by protecting and creating habitats and managing land appropriately, to value, protect and enhance the diversity of the built environment.

Guidance

12.2.26 This Ecological Impact Assessment (EIA) has been undertaken in accordance with the following industry guidance and standards:

- Chartered Institute of Ecology and Environmental Management (CIEEM) (2018) Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater and Coastal, 3rd Edition;
- British Standard 42020:2013 – Biodiversity. Code of Practice for planning and development; and
- CIRIA Guidance note C692 Environmental Good Practice on Site Guide (3rd Edition).

12.2.27 The following species-specific guidance and standards have been used during the assessment process:

- Natural England (2015) Standing advice on protected species (bats (all species), great crested newts *Triturus cristatus*, badgers, water voles *Arvicola amphibius*, otters *Lutra lutra*, reptiles, protected plants, invertebrates and white-clawed crayfish *Austropotamobius pallipes*);

- British Standard 5837:2012 – Trees in relation to design, demolition and construction;
- Bat Conservation Trust and Institute of Lighting Engineers (2018) Bats and Artificial Lighting in the UK;
- Dean *et al.* (2016) The Water Vole Mitigation Handbook (The Mammal Society Guidance Series);
- Edgar *et al.* (2010) Reptile Habitat Management Handbook;
- English Nature (2001) Great Crested Newt Mitigation Guidelines;
- Joint Nature Conservation Committee (JNCC) (2003) Herpetofauna Worker's Manual;
- Natural England (2014) Otters: surveys and mitigation for development projects. Natural England Standing Advice;
- Natural England (2015) Badgers: surveys and mitigation for development projects. Natural England Standing Advice;
- Natural England (2015) Bats: surveys and mitigation for development projects. Natural England Standing Advice;
- Natural England (2015) Great crested newts; surveys and mitigation for development projects. Natural England Standing Advice;
- Natural England (2015) Invertebrates; surveys and mitigation for development projects. Natural England Standing Advice;
- Natural England (2015) Reptiles; surveys and mitigation for development projects. Natural England Standing Advice;
- Natural England (2015) Water voles: surveys and mitigation for development projects. Natural England Standing Advice;
- Strachan and Moorhouse (2011) Water Vole Conservation Handbook, 3rd Edition; and
- GB Non-native Species Secretariat (2015) Species Information

12.3 Consultation

12.3.1 Consultation is a key part of the Development Consent Order (DCO) application process. To date, consultation regarding Terrestrial Ecology has been to obtain the biological data records in 2018, reviewing and drawing on the information reported within the Scoping Report (Royal HaskoningDHV, 2018) and the two rounds of Public Information Days (PIDs) in September 2018 and February 2019. In addition, a meeting with Natural England was held on the 11th February 2019

where the scope and approach to the ecological assessment was discussed and agreed. Further consultation will be undertaken after the PEIR is published. Full details of the project consultation process are presented within **Chapter 7 Consultation**.

12.3.2 Consultation that has been undertaken throughout the pre-application phase has informed the approach to the assessment of terrestrial ecology impacts and the information presented in this Chapter. A summary of the consultation relevant to Terrestrial Ecology is detailed in **Table 12.3**.

Table 12.3 Consultation and Responses

Consultee and Date	Response	Chapter Section Where Consultation Comment is Addressed
The Planning Inspectorate Scoping Opinion July 2018	The Inspectorate accepts that significant effects are unlikely to result from the Proposed Development with respect to invasive plant species, dormice, white clawed crayfish. The information in the Scoping Report is limited, however, this decision is based on an understanding that the habitats within the Study Area are suboptimal for these species and they are therefore unlikely to be present. However, the ES should include the information that supports this position.	Section 12.6 provides information on the environment gathered through both the desk and field surveys completed to inform this EclA.
The Planning Inspectorate Scoping Opinion July 2018	Regarding great crested newts, the Inspectorate considers that insufficient survey information has been provided for potential breeding ponds and inadequate justification has been provided regarding the Study Area applied.	Section 16.15 provides information in respect to great crested newts.
The Planning Inspectorate Scoping Opinion July 2018	The Scoping Report notes Havenside Local Nature Reserve (LNR) as the closest statutory designated site and provides a description; however, there is no figure to depict its location in relation to the Proposed Development. The Inspectorate considers the three Local Wildlife Sites mentioned in the scoping report, however, the exact location of these sites in relation to the Proposed Development site and all designated sites referred to in the assessment.	Section 16.6 provides information in relation to LNRs. The locations of LNR's are shown on Figure 12.2 .
The Planning Inspectorate Scoping Opinion July 2018	<u>Designated sites – indirect effects</u> The scoping report states that as there are not Sites of Special Scientific Interest (SSSI), National Nature Reserves (NNR), Special Areas of Conservation (SAC), Special Protection Areas (SPA) or Ramsar sites within 2km and that there is no potential impact on these designations. No justification is provided in the Scoping Report as to why no indirect impacts could occur beyond 2km. The Inspectorate considers that the ES should assess potential indirect impacts on designated sites and advises that significant effects could occur as a result of shipping movements associated with the Proposed Development or from the construction and maintenance of the new wharf	Section 12.6 provides information on the statutory designated sites within the Study Area for this EclA. Chapter 17 Marine and Coastal Ecology

Consultee and Date	Response	Chapter Section Where Consultation Comment is Addressed
	<p>and berths. The ES should include an assessment of indirect effects on The Wash SPA and Ramsar site working in co-ordination with the proposed HRA, as required by the 2017 EIA Regulations. This aspect chapter should cross refer to Chapter 17 Marine and Coastal Ecology to provide additional clarity to the reader and avoid repetition.</p>	
The Planning Inspectorate Scoping Opinion July 2018	<p><u>Habitats of ecological value</u> The Inspectorate advises that the ES should include an assessment of significant effects on all habitats likely to be impacted by the Proposed Development including an assessment of their ecological value. This should include an assessment of the loss of saltmarsh and intertidal mudflat habitats, where significant effects could occur.</p>	<p>Section 12.6 provides information on the baseline environment within the Study Area, for which has informed this EclA.</p> <p>Chapter 17 Marine and Coastal Ecology provides information on intertidal mudflat habitats.</p>
The Planning Inspectorate Scoping Opinion July 2018	<p><u>Potential effects on water voles, reptiles</u> Given the potential presence of water voles and reptiles, the Inspectorate considers that significant effects may occur. Consequently, the Inspectorate considers that the ES should include an assessment of the likely significant effects on water voles and reptiles and should be supported by appropriate survey information.</p>	<p>Section 12.6 provides information on the baseline environment within the Study Area, for which has informed this EclA.</p>
The Planning Inspectorate Scoping Opinion July 2018	<p><u>Birds – including foraging water bird species, ground nesting birds, foraging raptors</u> The Inspectorate considers that an assessment of foraging water birds, ground nesting birds, and foraging raptors should be assessed in the ES. Given the information on baseline conditions and predicted potential effects it is not apparent why it is stated in Paragraph 6.6.39 of the Scoping Report that no further bird survey work is required. As assessment should be made in the ES of the significant effects on these features, supported by appropriate survey information and data gathering. Cross reference should be made in this chapter of the ES to the aspect of Chapter 17 Marine and Coastal Ecology.</p>	<p>Section 12.6 provides information on the baseline environment within the Study Area, for which has informed this EclA.</p>
The Planning Inspectorate Scoping Opinion July 2018	<p><u>Bats – particularly foraging bats</u> Paragraph 6.6.32 of the Scoping Report states that no further bat survey work in relation to bat foraging activity is required. The Inspectorate has had regard to the baseline information contained within the Scoping Report and does not agree. The ES should include an assessment of the likely significant effects to bats, including foraging bats. The assessment should be supported by appropriate survey information and data gathering.</p>	<p>Section 12.6 provides information on the baseline environment within the Study Area, for which has informed this EclA.</p>

Consultee and Date	Response	Chapter Section Where Consultation Comment is Addressed
The Planning Inspectorate Scoping Opinion July 2018	<u>Invertebrates</u> The Inspectorate considers that further survey effort for invertebrates is required to inform the assessment of likely significant effects and this should be presented in the ES.	Section 12.6 provides information on the baseline environment within the Study Area, for which has informed this EclA.
The Planning Inspectorate Scoping Opinion July 2018	<u>Scope of EIA</u> The ES must clearly set out the features taken forward into the EIA and provide justification for the scope presented, with reference to where agreement has been reached with relevant consultees.	Section 12.5 provides information on the Scope of this EclA.
The Planning Inspectorate Scoping Opinion July 2018	<u>Potential construction effects</u> The ES should assess the likely significant effects to ecological receptors during the construction phase, e.g. the bat roost sites to be affected, the area of habitats to be removed and retained, and the anticipated nature of pollution and disturbance effects including those from noise and lighting.	Section 12.6 provides information on the baseline environment within the Study Area, for which has informed the construction impacts considered within this EclA.
The Planning Inspectorate Scoping Opinion July 2018	<u>Potential operational effects</u> The Inspectorate considers that specific impacts associated with the operation of the Application Site, including those associated with night-time operation and lighting, and transportation of materials, must be identified in the ES and assessed where significant effects may occur.	Section 12.6 provides information on the baseline environment within the Study Area, for which has informed the operational impacts considered within this EclA.
The Planning Inspectorate Scoping Opinion July 2018	<u>Mitigation</u> The ES should describe the anticipated efficacy of any proposed mitigation measures and present residual effects following mitigation. The mechanism by which mitigation is secured e.g. DCO requirements or other legal agreement, should also be provided in the ES.	Section 12.6 provides information on the baseline environment and subsequently the potential impacts on the ecological receptors which in turn has enabled the mitigation measures to be identified.
The Planning Inspectorate Scoping Opinion July 2018	<u>Cumulative effects</u> The assessment of impacts to ecological receptors should include an assessment of cumulative effects with other development.	Section 12.7 provides information in relation to Cumulative Impacts.
Environment Agency Scoping Opinion July 2018	Updated protected species surveys may need to be undertaken by suitably qualified ecologists at appropriate times of year to account for the dynamic nature of some species and the suitable habitat that exist within the	Section 12.6 provides information on the statutory designated sites within the Study

Consultee and Date	Response	Chapter Section Where Consultation Comment is Addressed
	<p>boundary of the proposed development and in the surrounding area.</p> <p>Where possible, suitable habitat should be integrated within the project to deliver net gains for Biodiversity in line with current environmental policy. The integration of mitigation measures under the Water Framework Directive (WFD) may also have wider ecological and biodiversity gains, further than preventing deterioration of water status.</p> <p>The Environment Agency states that aquatic species information may need to be supplanted with additional surveys to provide evidence on the potential impacts and suitable mitigation as part of the proposed development.</p>	<p>Area for this EclA.</p> <p>Chapter 13 Surface Water, Flood Risk and Drainage Strategy Appendix 13.1 Water Framework Directive Compliance Assessment.</p>
Natural England Scoping Opinion July 2018	<p>Natural England advises that the potential impact of the proposal upon features of nature conservation interest and opportunities for habitat creation/enhancement should be included within this assessment in accordance with appropriate guidance. Guidelines for EclA have been developed by CIEEM.</p>	<p>Section 12.6 provides information on the statutory designated sites within the Study Area for this EclA.</p>
Natural England Scoping Opinion July 2018	<p>Natural England advises that the ES should thoroughly assess the potential for the proposal to affect designated sites. European sites fall within the scope of the Conservation of Habitats and Species Regulations 2017. In addition, paragraph 118 of the National Planning Policy Framework requires that potential Special Protection Areas, possible Special Areas of Conservation, listed or proposed Ramsar sites, and any site identified as being necessary to compensate for adverse impacts on classified, potential or possible SPAs, SACs and Ramsar sites be treated in the same way as classified sites.</p> <p>Under Regulation 61 of the Conservation of Habitats and Species Regulations 2017 an appropriate assessment needs to be undertaken in respect of any plan or project which is:</p> <ul style="list-style-type: none"> (a) Likely to have a significant effect on a European site (either alone or in combination with other plans or projects) and (b) Not directly connected with or necessary to the management of the site. <p>Should a Likely Significant Effect on a European/Internationally designated site be identified or be uncertain, the Local Planning Authority may need to prepare an Appropriate Assessment, in addition to consideration of impacts through the EIA process.</p>	<p>Section 12.6 provides information on the statutory designated sites within the Study Area for this EclA.</p> <p>Further information in relation to the HRA is presented in Appendix 17.1 Habitats Regulations Assessment.</p>
Natural England Scoping Opinion	<u>Regionally and Locally Important Sites</u> The EIA will need to consider any impacts upon local	Regionally Important Geological Sites are

Consultee and Date	Response	Chapter Section Where Consultation Comment is Addressed
July 2018	<p>wildlife and geological sites. Local Sites are identified by the local wildlife trust, geoconservation group or a local forum established for the purposes of identifying and selecting local sites. They are of county importance for wildlife or geodiversity. The ES should therefore include an assessment of the likely impacts on the wildlife and geodiversity interests of such sites. The assessment should include proposals for mitigation of any impacts and if appropriate, compensation measures.</p>	discussed in Chapter 11 Contaminated Land, Land Use and Hydrogeology.
Natural England Scoping Opinion July 2018	<p><u>Protected Species – Species protected by the Wildlife and Countryside Act 1981 (as amended) and by the Conservation of Habitats and Species Regulations 2017</u></p> <p>The ES should assess the impact of all phases of the proposal on protected species (including great crested newts, reptiles, birds, water voles, badgers and bats). Natural England advises that records of protected species should be sought from appropriate local biological record centres, nature conservation organisations, groups and individuals; and consideration should be given to the wider context of the site for example in terms of habitat linkages and protected species populations in the wider area, to assist in the impact assessment.</p>	Section 12.6 provides information on the baseline environment within the Study Area, for which has informed this EclA.
Natural England Scoping Opinion July 2018	<p><u>Habitats and Species of Principal Importance</u></p> <p>The ES should thoroughly assess the impact of the proposals on habitats and/or species listed as 'Habitats and Species of Principal Importance' within the England Biodiversity List, published under the requirement of S41 of the Natural Environment and Rural Communities (NERC) Act 2006.</p> <p>Natural England advises that survey, impact assessment and mitigation proposals for Habitats and Species of Principal Importance should be included in the ES. Consideration should also be given to those species and habitats included in the relevant Local BAP.</p> <p>Natural England advises that habitat survey (equivalent to Phase 2) is carried out on the site, in order to identify any important habitats present. In addition, ornithological, botanical and invertebrate surveys should be carried out at appropriate times in the year, to establish whether any scarce or priority species are present. The Environmental Statement should include details of:</p> <ul style="list-style-type: none"> • Any historical data for the site affected by the proposal; • Additional surveys carried out as part of this proposal; • The habitats and species present; • The status of these habitats and species; 	Section 12.6 provides information on the baseline environment within the Study Area, for which has informed this EclA.

Consultee and Date	Response	Chapter Section Where Consultation Comment is Addressed
	<ul style="list-style-type: none"> • The direct and indirect effects of the development upon those habitats and species; • Full details of any mitigation or compensation that might be required. 	
Natural England (February 2019)	<p>Natural England's standing advice on protected species including Badgers, Bats, Otter, Water Vole is available here. We would suggest repeating the Water Vole survey due to an exceptionally dry summer in 2018, and also to resurvey for Badgers as they are known in the local area (from the south along the sea defence) and have been recently.</p>	<p>Noted and due to the mobility of species further surveys in respect to bats, water voles and badgers are planned to be undertaken in 2019.</p>
Lincolnshire Wildlife Trust April 2011	<ul style="list-style-type: none"> • Has a Local Environmental Records Centre (LERC) search been undertaken? • Understanding impact on LWS during both the construction and operational phases. • Biodiversity Net Gain should be included in the project. 	<p>Biological records have been received for the RLB plus up to a 2km search area in December 2018. Findings of which have been used to inform the baseline conditions and subsequent EclA.</p> <p>The construction phase may have an impact on the LWS. Consideration of potential impacts (or none) during the construction and operational phases of the Facility will be considered and consulted on with stakeholders to ensure mitigation measures (where required will be implemented).</p>

12.4 Assessment Methodology

EclA Methodology

12.4.1 This EclA has been undertaken in accordance with the Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater and Coastal (3rd Edition) (CIEEM, 2018). These guidelines aim to predict the residual impacts on important ecological features affected, either directly or indirectly by a development, once all the appropriate mitigation has been implemented.

- 12.4.2 The approach to determining the significance of an impact follows a systematic process for all impacts. This involves identifying, qualifying and, where possible, quantifying the sensitivity, value and magnitude of all ecological receptors which have been scoped into this assessment. Using this information, a significance of each potential impact has been determined. Each of these steps is set out in the remainder of this section.
- 12.4.3 This EclA has used professional judgement to ensure the assessed significance level is appropriate for each individual receptor, taking account of local values for biodiversity to avoid a subjective assessment wherever possible as per the CIEEM guidelines. As a result, the assessed significance level may not always be directly attributed to the guidance matrix detailed below.

Importance

- 12.4.4 The first stage of an EclA is determining the ‘importance’ of ecological features or ‘receptors’. CIEEM identifies the important ecological features as those key sites, habitats and species which have been identified by European, national and local governments and specialist organisations as a key focus for biodiversity conservation in the UK. These include:
- Statutory and non-statutory designated sites for nature conservation;
 - Species occurring on national biodiversity lists;
 - UK Habitats of Principal Importance; and
 - Red listed, rare or legally protected species.
- 12.4.5 Importance is also qualified by the geographic context of an ecological receptor, i.e. a species which may not be recognised on a national biodiversity list may be locally in decline, and therefore its local importance is greater than its national importance.
- 12.4.6 For this EclA, the guidelines outlined in **Table 12.4** have been followed to provide the relative importance of different ecological features.

Table 12.4 Definitions of Importance Levels for Terrestrial Ecology

Importance	Definition
High	<ul style="list-style-type: none"> • An internationally designated site or candidate site or an area which the statutory nature conservation organisation has determined meets the published selection criteria for such designation, irrespective if it has yet been notified; • A nationally designated site or a discrete area, including ancient woodlands, which the statutory nature conservation organisation has determined meets the published selection criteria for national

Importance	Definition
	<p>designation (e.g. SSSI selection guidelines) irrespective if it has yet been notified;</p> <ul style="list-style-type: none"> • A viable area of a habitat type listed in Annex 1 of the Habitats Directive, or smaller areas of such habitat which are essential to maintain the viability of a larger whole; • A viable area of a UK Habitat of Principal Importance or smaller areas of such habitat which are essential to maintain the viability of a larger whole; • A European protected species listed in The Conservation of Habitats and Species Regulations 2017; or • A regularly occurring, nationally significant population/number of any internationally important species.
Medium	<ul style="list-style-type: none"> • County Council/Unitary Authority designated sites and other sites which the designating authority has determined meet the published ecological selection criteria for designation, including Local Nature Reserves selected on defined ecological criteria and Wildlife Trust sites; • Viable areas of habitat identified in a Local Biodiversity Action Plan (LBAP); • Semi-natural woodland greater than 0.5 hectares (ha) which is in 'good condition'. • Any regularly occurring population of a nationally important species which is threatened or rare in the region; or • A regularly occurring, locally significant number of a species identified as important on a regional basis.
Low	<ul style="list-style-type: none"> • Semi-natural woodland greater than 0.25ha which is in 'good condition' or greater than 0.5ha in unfavourable condition; • Network of inter-connected hedgerows including some species-rich hedgerows; • Individual important hedgerows or other ancient-countryside linear features; • Viable areas of habitat identified in a sub-county (District/Borough) Biodiversity Action Plan (BAP); • Any regularly occurring population of a nationally important species which is not threatened or rare in the region or county; • Sites/features that are scarce within the District/Borough or which appreciably enrich the District/Borough habitat resource; or • Other features identified as wildlife corridors or migration routes
Negligible	<ul style="list-style-type: none"> • Features of value to the immediate area only e.g. within the site.

12.4.7 In addition to the features listed in **Table 12.4**, ecological features which play a key functional role in the landscape or are locally rare have been considered. The importance of such features has been determined by professional judgement.

12.4.8 CIEEM places the emphasis on using professional judgement when considering importance of ecological receptors, based on available guidance, information and expert advice (CIEEM, 2018). Different aspects of ecological importance should be taken into account, including designations, biodiversity value, potential value, secondary or supporting value, social value, economic value, legal protection and

multi-functional features.

Magnitude

12.4.9 The magnitude of the impact is assessed according to:

- The extent of the area subject to a predicted impact;
- The duration the impact is expected to last prior to recovery or replacement of the resource or feature;
- Whether the impact is reversible, with recovery through natural or spontaneous regeneration, or through the implementation of mitigation measures or irreversible, when no recovery is possible within a reasonable timescale or there is no intention to reverse the impact; and
- The timing and frequency of the impact, i.e. conflicting with critical seasons or increasing impact through repetition.

12.4.10 **Table 12.5** summarises the definitions of magnitude that have been used for the Terrestrial Ecology receptors.

Table 12.5 Magnitude of Impact

Magnitude	Definition
High	Major impacts on the feature / population, which would have a sufficient effect to alter the nature of the feature in the short to long term and affect its long-term viability. For example, more than 20% habitat loss or damage.
Medium	Impacts that are detectable in short and long-term, but which should not alter the long-term viability of the feature / population. For example, between 10 - 20% habitat loss or damage.
Low	Minor impacts, either of sufficiently small-scale or of short duration to cause no long-term harm to the feature / population. For example, less than 10% habitat loss or damage.
Negligible / No Impact	A potential impact that is not expected to affect the feature / population in any way, therefore no effects are predicted.

Duration

12.4.11 The definitions of duration used within this EclA are dependent on the individual ecological receptor, and how sensitive it is to effects over different timescales. However, in general terms the following definitions have been used:

- **Short term** – effects which at most occur over a part of – or over a part of a key period of – a species' active season or a habitat's growing season, i.e. typically effects which occur over a matter of days or weeks;

- **Medium term** – effects which occur over the full duration of a species' active season or a habitat's growing season, i.e. typically, effects which occur over a matter of months or one year; and
- **Long term** – effects which occur over the multiple active or growing seasons, i.e. typically, effects which occur over more than one year.

12.4.12 Where deviations from these definitions are used within **Section 12.7**, this is explained within the text.

Impact significance

12.4.13 Following the identification of receptor importance and magnitude of the effect, it is possible to determine the significance of the impact.

12.4.14 Ecologically significant impacts are defined as:

'...impacts on structure and function of defined sites, habitats or ecosystems and the conservation status of habitats and species (including extent, abundance and distribution)' (CIEEM, 2018).

12.4.15 Impacts are unlikely to be significant where features of low importance are subject to small scale or short-term effects. If an impact is found not to be significant at the level at which the resource or feature has been valued, it may be significant at a more local level.

12.4.16 CIEEM recommend that the following factors are considered when determining significance for selected ecological receptors.

12.4.17 Designated/defined sites and ecosystems

- **Designated sites** - is the project and associated activities likely to undermine the site's conservation objectives, or positively or negatively affect the conservation status of species or habitats for which the site is designated, or may it have positive or negative effects on the condition of the site or its interest/qualifying features?
- **Ecosystems** – is the project likely to result in a change in ecosystem structure and function?

12.4.18 Habitats and species

- **Habitats** – conservation status is determined by the sum of the influences acting on the habitat that may affect its extent, structure and functions as well as its distribution and its typical species within a given geographical area.

- **Species** – conservation status is determined by the sum of influences acting on the species concerned that may affect its abundance and distribution within a given geographical area (CIEEM, 2018).

12.4.19 Following the identification of receptor importance and magnitude of effect, the significance of the impact has been considered using the matrix presented in **Chapter 6 Approach to EIA, Table 6.1** and knowledge of the ecological features affected.

12.4.20 The assessment of potential impacts has been undertaken assuming implementation of embedded mitigation and commitments for the project. Residual impacts include any additional mitigation measures required. An assessment of residual impacts is then made, after assuming implementation of additional mitigation measures where required, i.e. the significance of the effects that are predicted to remain after the implementation of all committed mitigation measures.

12.4.21 The impact significance categories are defined as shown in **Chapter 6 Approach to EIA, Table 6.2**.

12.4.22 Note that for the purposes of this EIA, major and moderate impacts are deemed to be significant. In addition, whilst minor impacts are not significant in their own right, it is important to distinguish these from other non-significant impacts as they may contribute to significant impacts cumulatively or through interactions.

12.4.23 Embedded mitigation has been referred to and included in the initial assessment of impact. If the impact does not require mitigation (or none is possible) the residual impact remains the same. If, however, mitigation is required an assessment of the post-mitigation residual impact is provided.

Cumulative Impact Assessment

12.4.24 For an introduction to the methodology used for the Cumulative Impact Assessment (CIA), please refer to **Chapter 6 Approach to EIA**. This chapter includes those cumulative impacts that are specific to Terrestrial Ecology.

12.4.25 The key consideration with respect to Terrestrial Ecology is whether there is a spatial or temporal overlap of effects from projects on the same receptors. Therefore, for habitats and non-mobile species, unless there is a spatial overlap there is no pathway for cumulative impact between spatially separated projects. There is however a potential for a cumulative impact upon the overall habitat resource at a regional or national level. Where potential regional or national level impacts are identified and considered to be relevant they are highlighted in the

CIA.

12.4.26 For mobile species, there is only a pathway for cumulative impact if there is spatial overlap of potential receptor ranges in addition to temporal overlap with the activity or its resultant impact i.e. where developments follow on from one another before the species has recovered from displacement or other impact. In addition, whilst it is assumed that any consented development would be subject to mitigation and management measures which would reduce impacts to non-significant unless there were exceptional circumstances, it is accepted that such projects may contribute to a wider cumulative impact.

12.4.27 Finally, in cases where this project has **negligible** or **no impact** on a receptor (through for example avoidance of impact through routing or construction methodology) it is considered that there is no pathway for a cumulative impact.

Transboundary Impact Assessment

12.4.28 There are no transboundary impacts with regards to Terrestrial Ecology because the proposed infrastructure is not sited near any international boundaries.

12.5 Scope

Study Area

12.5.1 The development footprint is referred to hereafter as 'the Application Site' and is shown on **Figure 1.1**.

12.5.2 A full description of, and associated information for, the Application Site is provided in **Chapter 5 Project Description**.

Data Sources

12.5.3 This EclA has been informed by the findings from a desk-based exercise and field survey data which has been collected between August 2017 and October 2018. This has been included in **Appendix 12.1 Extended Phase 1 Habitat Report**. This data has been collected for different Study Areas depending on the receptor concerned and upon the project information available at the time of the data collection.

12.5.4 The assessment was undertaken with reference to several sources, as detailed in **Table 12.6**.

Table 12.6 Key Information Sources

Data Source	Reference
Desk Study Data	
MAGIC	Search for statutory and non-statutory designated sites within and up to 2km of the Application Site. https://magic.defra.gov.uk/MagicMap.aspx
Lincolnshire Ecological Records Centre (LERC)	Data received in December 2018 from Greater Lincolnshire Nature Partnership for the Application Site and up to 5km from its boundaries.
Field survey data	
Extended Phase 1 Habitat Survey (2017 & 2018)	<p>An Extended Phase 1 Habitat Survey following 'Extended Phase 1' methodology as set out in <i>Guidelines for Baseline Ecological Assessment</i> (Institute of Environmental Assessment (IEA), 1995). Habitats were classified and mapped following JNCC's <i>Handbook for Phase 1 habitat survey: A technique for environmental audit</i> (2010).</p> <p>Included a search for:</p> <ul style="list-style-type: none"> • Field signs of badgers; • Assessment of roost suitable trees and structures for bats; • Assessment of commuting/foraging suitability of all linear features for bats; • Field signs of otter; • Assessment of suitability of watercourse to support water voles; • Habitats suitability assessment of all standing water bodies for ability to support great crested newts; • Assessment of suitability of habitats to support reptiles; • Assessment of suitability of habitats to notable invertebrates; and • Evidence of non-native invasive species.

Table 12.7 Study Areas for Different Terrestrial Ecology Receptors Used for This EclA

Data/Survey	Study Area
Statutory designated sites	Within and up to 2km of the Application Site.
Non-statutory designated sites	Within and up to 2km of the Application Site.
Species and Habitat Distribution	Within and up to 2km of the Application Site
Badger Distribution	Within and up to 2km of the Application Site

Data/Survey	Study Area
Location of ponds	Within and up to 250m of the Application Site

Assumptions and Limitations

- 12.5.5 The absence of records does not imply any species, habitat or designation is absent from the search area. Nor does recorded presence imply current, continuing or breeding presence. Despite these caveats, biological records provide very useful supporting data to provide context and supplement field survey data.
- 12.5.6 The Lincolnshire Ecological Records Centre (LERC) data comprises of records collected by volunteers and therefore may not necessarily provide a true reflection of the species present at and surrounding the Application Site.
- 12.5.7 The field surveys which have been undertaken to date have been undertaken within the optimal surveying windows. Landowner access has been possible to all of the field survey Study Area (i.e. the Application Site infrastructure plus a 50m buffer).
- 12.5.8 For the purposes of this EclA, an assessment of the habitat available has been made using the findings from the Extended Phase 1 Habitat Survey or freely available online data sources, which in combination has allowed an assessment of those species which are likely to utilise these habitats to be made.
- 12.5.9 An Extended Phase 1 Habitat Survey was originally undertaken in August 2017 and updated in October 2018, which are both within a suitable surveying window for this survey.
- 12.5.10 The survey team made the utmost effort to cover every habitat and record all field signs present during the field surveys. The data drawn on to inform this EclA, is considered to provide an accurate description of the habitats and accurate account of species presence / absence within the survey area.
- 12.5.11 Ecological surveys are limited by factors which affect the presence of plants and animals such as the time of year, migration patterns and behaviour. Although, despite the above limitations, the information and conclusions drawn within this EclA is considered to be valid and robust.

12.6 Existing Environment

Statutory Designated Sites

- 12.6.1 The survey area is not located within a statutory or proposed statutory site of importance for nature conservation.
- 12.6.2 Havenside Local Nature Reserve (LNR) is located approximately 140 m east of the survey area at its closest point on the eastern bank of The Haven (tidal River Witham) (**Figure 12.2**).
- 12.6.3 As a statutory designated site for nature conservation, Havenside LNR, is considered to be of high importance.

Non-statutory Designated Sites

- 12.6.4 The survey area is not located within a non-statutory site of importance for nature conservation.
- 12.6.5 There are three Local Wildlife Sites (LWS) within 2km of the Application Site (**Figure 12.2**), specifically:
- Havenside LWS (0.26km);
 - South Forty Drain LWS (1.47km); and
 - Slippery Gowt Sea Bank LWS (0.47km).
- 12.6.6 All non-statutory designated sites are considered to be of **medium** importance.

Flora and Habitats

Habitats

- 12.6.7 The baseline presented here is based on the field survey data collected during the 2017 and 2018 Extended Phase 1 Habitat Surveys. Full details of these surveys are provided in **Appendix 12.1**. Features of interest are described in 'Target Notes', which are referenced using a numbering system. The locations of the Target Notes (TN) are shown on **Figure 12.1**.
- 12.6.8 The key habitats recorded within the survey area during the 2017 survey and reconfirmed as being present during the 2018 survey, include:
- Semi-improved neutral grassland with scattered scrub comprising species such as bramble Rubus fruticosus, teasel Dipsacus spp., and nettle Urtica dioica);
 - Area of tall ruderals (comprising predominantly nettle);

- Areas of scattered and dense scrub;
- Species poor intact hedgerows;
- Species rich hedgerows with trees;
- Areas of amenity grassland;
- Areas of bare ground (hard standing and areas or rubble);
- Areas of bare ground (with scattered shrub);
- Semi-natural broadleaved woodland;
- Dry ditches (drainage channels);
- Marginal vegetation; and
- Running water (brackish).

12.6.9 There is no ancient woodland within the Application Site.

12.6.10 The north-eastern extent of the survey area adjoins Coastal Saltmarsh and Mudflat Priority Habitat. The Facility will involve a localised loss of these habitats (0.4 ha and 0.8 ha respectively) to accommodate the proposed wharfage facilities on The Haven for the RDF feedstock delivery and lightweight aggregate export. This loss of Priority Habitat would account for a very small proportion of the overall saltmarsh and mudflat habitat locally. Further information in relation to these habitats and associated impacts and mitigation measures is provided in **Chapter 17 Marine and Coastal Ecology**.

12.6.11 The construction works will lead to a permanent loss of these habitats but given the extent of these habitat types within the surrounding area, in combination with their low ecological value the magnitude of effect is minor.

12.6.12 Without mitigation, the greatest magnitude arising is **minor adverse** magnitude on a low value receptor, results in an impact of **minor adverse** significance.

12.6.13 Following the implementation of appropriate mitigation measures considered necessary, in combination with the landscape mitigation planting proposals, the magnitude of the effect remains **low**, on a **medium** importance receptor. Representing a temporary residual impact of **minor adverse** significance.

Protected, Notable and Invasive species

12.6.14 This section provides a summary of the key species recorded within the Application Site and up to 50m from its boundaries. The information provided in this section has drawn on the biological records obtained from the desk study and

the findings from the 2017 and 2018 field surveys.

Invasive species

- 12.6.15 There are several recent records of invasive species, including Japanese knotweed (record dated November 2009, approximately 1.2km from the Application Site) and Giant hogweed (record dated 2016).
- 12.6.16 No invasive plant species were recorded within the survey area during the 2017 and 2018 Extended Phase 1 Habitat Surveys. Consequently, invasive species are absent and have not been considered further in this report.

Legally Protected and Notable Species

Badgers

- 12.6.17 Badgers have been recorded within and up to 2km from the Application Site (**Figure 12.3**), the most recent being 2016. The closest record is approximately 900m west of the survey area at its closest point, recorded in October 2007.
- 12.6.18 No evidence of badgers was recorded within the survey area; however suitable habitat for badger is present within the survey area. Although suitable habitat is present, the survey area comprises largely open grassland area, and is subject to regular human disturbance. Consequently, it is considered unlikely that badgers use the survey area for residence. Therefore, badgers are considered absent but due to the mobility of this species, further surveys will be undertaken prior to confirm this species remains absent.

Water Voles

- 12.6.19 There are recent records of water vole within 2km of the survey area, the most recent being 2017. The closest record is approximately 800m west of the survey area at its closest point, recorded in October 2007
- 12.6.20 There are a series of ditches within the survey area. All of these were dry at the time of the 2017 and 2018 survey and therefore assessed as sub-optimal for water vole. However, due to the summer of 2018 being exceptionally dry, a repeated water vole habitat suitability assessment will be undertaken in 2019 to confirm this conclusion remains valid. This approach was agreed with Natural England at the meeting held in February 2019.
- 12.6.21 For the purposes of this EclA at the time of its preparation, the findings from the 2017 and 2018 survey have been used and therefore it is considered that water voles are absent from the survey area and as such are not considered further in this report. However, this conclusion will be reviewed once the findings from the

2019 survey are available.

Otters

12.6.22 There are no recent records of otter within 2km of the survey area. The section of the tidal River Witham within the survey area does not provide suitable holt building habitat for otters due to a lack of bankside features that would provide suitable cover. Furthermore, the ditch network within the survey area was assessed as sub-optimal for otters. Therefore, otters are considered to be absent and are not considered further in this assessment. However, otters may use the tidal River Witham for commuting in the wider area.

Great crested newts and white clawed crayfish

12.6.23 There are no recent records for great crested newts or white clawed crayfish within 2km of the survey area.

12.6.24 A Habitat Suitability Index Assessment (HIS) confirmed that the ephemeral ponds within the survey area are of ‘poor’ suitability for great crested newts. It is considered that great crested newts are unlikely to be present within the survey area due to poor quality of this habitat, and lack of suitable surrounding terrestrial habitat (with the River Witham creating a barrier to movement, and the surrounding terrestrial habitat lacking suitable shelter). Therefore, great crested newts have been scoped out of any further assessment.

12.6.25 The River Witham waterbody was also concluded to be sub optimal for white clawed crayfish due to the absence of suitable habitats for burrowing and refugia, and the ditch network within the survey area does not provide habitat (i.e. flowing water) suitable for white clawed crayfish. Therefore, white clawed crayfish have been scoped out of any further assessment.

Bats

12.6.26 There is a total of 117 records of bat species within 2km of the survey area, with the closest observation being approximately 400m north-east of the survey area at its closest point. No evidence of bat roost potential was noted within the trees in the survey area. However, the hedgerows and areas of scrub are assessed and concluded as providing suitable foraging and commuting opportunities for bats. Further surveys to confirm the current usage of these habitat features will be undertaken during the optimal surveying period which is typically between May and September. However, and in the absence of these survey in combination with the sensitivity of this receptor there is the potential for significant impacts during construction without mitigation.

12.6.27 There are potential impacts to commuting/foraging bats as a result of vegetation clearance, i.e. removal of hedgerows. Consequently, the reduction in available foraging habitat, would in turn reduce the insect biomass of the area and therefore reduce the foraging habitat available to bats.

12.6.28 Bats are known to use hedgerows to commute along to navigate around the landscape and some species are potentially sensitive to gaps in hedgerows such as species in the genera *Myotis* and *Plecotus* due to the nature of their flight pattern. Species from the genera *Nyctalus* and *Eptesicus*, and *Nathusius'* pipistrelle bats are known to fly high and in open habitats and therefore are unlikely to be impacted by hedgerow severance. Common pipistrelle and soprano pipistrelle bats are generalist species and would tolerate gaps in hedgerows. There is very limited research regarding whether gaps actually negatively affect *Myotis* / *Plecotus* species. Bats would be more visible to potential predators while they fly across the gaps as they would have no cover.

12.6.29 Without mitigation, the greatest magnitude arising is high magnitude on a high importance receptor, which would represent an impact of at worst **major adverse** significance.

12.6.30 Mitigation measures will be identified once detailed design is completed and the exact nature of impacts is known. Examples of the types of mitigation measures that may be considered include:

- Pre-construction survey to confirm the presence of bats;
- Replanting of hedgerows lost during construction works within alternative locations;
- All temporary lighting to be designed in line with the BCT Bats and Lighting in the UK guidance (2018). This to include the use of directional lighting during construction;
- Construction phase lighting will be limited to between 7am-7pm in low light conditions, with lower-level security lighting outside of these times; and
- Ensure that dark corridors remain in place during the construction phase.

12.6.31 Following the implementation of the agreed mitigation measures considered necessary the magnitude of effect is expected to reduce from high to low on a high importance receptor, representing a temporary residual impact of moderate adverse significance.

Reptiles

12.6.32 There are no recent records of reptile within 2km of the survey area and none were observed during the 2017 and 2018 surveys. But, there are suitable habitats within the survey area which reptiles could use. No specific reptile survey of these areas will be required. However, without mitigation the following effects may occur during the construction phase:

- Temporary loss of suitable reptile habitat;
- A risk of killing or injuring reptiles which are active within these areas; and
- A risk of habitat degradation due to pollutant release during the construction phase.

12.6.33 Without mitigation, the greatest magnitude arising is **high** magnitude on a **medium** importance receptor, results in an impact of at worst **moderate adverse** significance.

12.6.34 Mitigation measures will include the adherence to a pre-cautionary method of working (PMoW) during construction, including tool box talk, habitat manipulation and ecological supervision. This PMoW comprises the implementation of a reptile sensitive clearance methodology (under ecological supervision) prior to any construction works within the footprint of the Facility. This will ensure that any reptiles are safeguarded from the construction process.

12.6.35 5.4.2 The reptile sensitive methodology involves habitat manipulation followed by a destructive search. Habitat manipulation will be carried out a maximum of one week prior to works commencing on site. Any potential sheltering features will be inspected (visually and by hand) before entire removal by an ecologist. Any reptiles present can then be rescued and moved to an identified and suitable location (which has been identified prior to works commencing). Any vegetation removal works should start from the furthest extent so that any reptiles, should they be present, can move into an area that will not be accessed or disturbed by the works. All arisings should be removed from the works area immediately and either taken off-site or placed in a predetermined location well away from the works area (and any access). A method statement for these actions will be prepared by an ecologist in advance of any works starting on site. This work will be undertaken within the reptile activity season (March–October inclusive).

12.6.36 Following the implementation of the agreed mitigation measures considered necessary the magnitude of effect is expected to reduce from **high** to **low** on a **medium** value receptor, representing a temporary residual impact of **minor adverse** significance.

Dormice

12.6.37 There are no records of dormice within 2km of the survey area and no evidence of dormice was recorded during the 2017 and 2018 surveys. There is no suitable habitat for dormice within the survey area, therefore dormice have been scoped out of any further assessment in this report.

Birds

12.6.38 The development could result in direct and in-direct impacts to birds because of disturbance and habitat loss. Further information in relation to birds is provided in **Chapter 17 Marine and Coastal Ecology**. With regards to terrestrial birds, the species noted during surveys completed to date are common species. No species of conservation concern or Schedule 1 protection have been noted.

12.6.39 The Facility will require the removal of habitats and features for which common nesting birds may use. As part of the embedded mitigation, all areas of vegetation will be planned to be removed outside of the nesting bird season. Where this is not possible, pre-work checks will be undertaken at least 24-48hrs before the vegetation is removed to check for active nests.

12.6.40 Following the implementation of the embedded mitigation measures, the magnitude of effect is expected to reduce from **high** to **low** on a high value receptor, representing a temporary residual impact of **minor adverse** significance.

Aquatic and terrestrial invertebrates

12.6.41 The grassland, scrub, trees and woodland on site may support common species of terrestrial invertebrates. The tidal River Witham and mudflats may also provide suitable habitat for common species of aquatic invertebrates.

12.6.42 Further details are provided in **Chapter 17 Marine and Coastal Ecology** in respect to aquatic invertebrates.

Embedded Mitigation

12.6.43 As part of the project design, several embedded mitigation measures have been proposed to reduce potential impacts on Terrestrial Ecology. These measures are considered standard industry practice for this type of the development. Where embedded mitigation measures have been developed into the design with species regard to terrestrial ecology, these are described below. Any further mitigation measures suggested within this chapter are therefore considered to be additional mitigation.

12.6.44 The proposed design has where possible avoided sensitive ecological receptors such as habitats and/or features known to support legally protected species. Where this is not possible, and habitats and/or features require removal, these will be programmed to be removed to avoid sensitive periods (i.e. outside of nesting bird season). In addition, suitable maintenance of any newly planted habitats following construction will have an aftercare period, with any failures being replaced.

12.6.45 Lighting requirements associated with the Facility has been designed to be sensitive to bats and birds in accordance with the relevant and most recent industry guidance.

Potential Impacts during Construction and Operation

Loss of habitat (construction)

12.6.46 The Facility will result in the loss of the following habitats:

- Approximately 0.8 ha of mudflat; and
- Approximately 0.4 ha of saltmarsh.

12.6.47 Further details in respect to the impacts and mitigation for the loss of the mudflats and coastal saltmarsh is provided in **Chapter 17 Marine and Coastal Ecology**.

12.6.48 The loss of these remaining habitats will be permanent, however, given their low ecological value, it is considered that the magnitude of the effect will be minor. Furthermore, landscape mitigation planting is incorporated within the Facility which in turn will result in long-term benefits to both visual amenity and ecological receptors. Further information is provided in **Chapter 9 Landscape and Visual Impact Assessment**.

Noise and Lighting – impact on bats and birds during construction and operation

12.6.49 Noise and visual disturbance from the Application Site may result from any night working which may occur as part of the construction of the development. This impact would be considered of **medium** importance as bats are a protected species under the Conservation of Habitats and Species Regulations 2017 and birds are protected by the Wildlife and Countryside Act 1981 (as amended). The magnitude of noise and lighting would be considered as **medium**; because there are 117 records of bat species within 2km of the survey area. However, the impact is not of **high** magnitude because no bat roost potential or nesting birds were noted within the Application Site during either of the Phase 1 Habitat Surveys in 2017 and 2018.

12.6.50 Therefore, this impact would have a **moderate** significance as lights and activity could interrupt foraging and commuting activity for bats and birds.

12.6.51 Mitigation to manage this impact should include the use of low pressure sodium lighting which will be located away from areas that could be used by bat/bird species (i.e. hedgerow and woodland habitats) where possible. All lights should also be pointed away from these features.

Reptiles

12.6.52 Although no reptiles were recorded during the 2017 and 2018 surveys; suitable habitat for basking has been noted and therefore there is potential for reptiles to be present within the working areas with regards to the Facility.

12.6.53 This impact is of **medium** importance, and **low** magnitude therefore, an overall **minor** significance; as mitigation measures will be put in place, hence it is unlikely to have any harmful effects on reptile species.

12.6.54 A reptile sensitive clearance methodology (under ecological supervision) will therefore be implemented prior to any construction works within the footprint of the Facility. This will ensure that any reptiles are safeguarded from the construction process.

Birds

12.6.55 As the survey area contains suitable nesting bird habitat, such as areas of scattered and dense scrub, trees and hedgerows. The bird species recorded within the survey area are common species and are therefore considered to be of **low** value therefore the impact is of **low** importance, and **low** magnitude, thus resulting in an overall **minor** significance.

12.6.56 Should there be a requirement for vegetation to be removed during the nesting bird season (March – August inclusive), a check of any vegetation to be removed would be required. An ecologist will need to check the area for nesting birds a maximum of 48 hours prior to the commencement of the works. Active nests and their associated vegetation/location must remain until young birds have left the nest and during this period an alternative approach to the works must be undertaken.

Aquatic and Terrestrial Invertebrates

12.6.57 As identified in the 2017 and 2018 Phase 1 Habitat Surveys, there are limited areas of habitat on site to support species of terrestrial and aquatic invertebrates. As the importance is **low**, and the magnitude is **low**, the overall significance of this impact is **minor**, as the following mitigation measures will be enforced.

12.6.58 The Facility will consider the potential to integrate suitable habitat for invertebrate species in its design. This could include measures such as a varied planting regime comprising scrub fringes such as hawthorn, field maple, blackthorn and ivy, which provide sheltered elevated temperatures for invertebrates, foraging areas for predatory wasps, and nectar and pollen for flower-dependent invertebrates.

Disturbance effects associated Maintenance Activities – impacts to species

12.6.59 The Facility will require regular visits from staff for routine maintenance. This has the potential to disturb protected species in proximity to the operational areas of the Facility, related to noise and/or physical presence of people. For the purposes of this assessment this is assumed to be up to one visit per week requiring a single vehicle, and staff visiting the sites during daylight hours.

12.6.60 Given the low frequency of the visits, disturbance from human presence is predicted to be of **negligible** magnitude and only affecting receptors within the immediate vicinity of the area(s) being visited.

12.6.61 Without mitigation, the greatest effect arising from maintenance activities is **negligible** magnitude on at worst high importance receptors, resulting in an impact of at worst **minor adverse** significance.

12.6.62 No mitigation is proposed given that the magnitude of effect is reduced as low as possible.

Potential Impacts during Decommissioning

12.6.63 No decision has been made regarding the final decommissioning policy for the Facility as it is recognised that industry best practice, rules and legislation change over time. The detail and scope of the decommissioning works will be determined by the relevant legislation and guidance at the time of decommissioning and agreed with the regulator. A decommissioning plan will be provided. As such, for the purposes of a worst case scenario, impacts no greater than those identified for the construction phase are expected for the decommissioning phase.

12.7 Cumulative Impacts

12.7.1 **Table 12.8** presents projects that are likely to have cumulative impacts when considered alongside the Facility. Each of these projects have been scoped in or out of the terrestrial ecology aspect of the cumulative impact assessment.

Table 12.8 Summary of Projects considered for CIA in Relation to Terrestrial Ecology

Project	Status	Development period	Distance from the Application Site (km)	Project definition	Project data status	Included in CIA	Rationale
Boston Barrier Flood Defence	Transport and Works Act Order consented	2017 – 2020	Boston Barrier at closest point to the Application Site is 500 m.	Environmental Statement	Complete/high	No	The construction programmes of this project and the Facility do not have the potential to overlap and therefore there are considered to be no interactions during the construction phase of this development and the Facility.
Triton Knoll Offshore Wind Farm	DCO consented	2008 - ongoing	Onshore cable corridor and Construction compound at Langrick 9.7 km from the	Environmental Statement	Complete/ high	No	Due to distance of this project from the Facility, there are considered

			Application Site				to be no interactions.
Viking Link Interconnect or B/17/0340	Application approved	2014 - 2023	Bicker Fen substation 14.4 km from the Application Site	Environmental Statement	Incomplete	No	Due to distance of this project from the Facility, there are considered to be no interactions.
Battery Energy Storage Plant (Marsh Lane) B/17/0467	Application approved	2017 - ongoing	Beeston Farm less than 10 m from the Application Site	Detailed application	Incomplete	No	Given the nature of this project it is considered to result in no interaction with the Facility.
The Quadrant Mixed-use development of 502 dwellings and commercial/leisure uses B/14/0165	Application approved Construction started	2014 - ongoing	Quadrant 1 1.2 km from the Application Site	Details within ES	Quadrant 1 – Complete/ high Quadrant 2 - Incomplete/low	No	Due to distance of this project from the Facility, there are considered to be no interactions.
Land to the west of Stephenson Close Residential Development	Application not yet determined	2017 - ongoing	From the most eastern part of the Scheme to the	Outline only	Incomplete/low	No	Due to distance of this project from the Facility, there are

of up to 85 dwellings B/17/0515			Application Site is 550 m.				considered to be no interactions.
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Table 12.9 Potential Cumulative Impacts

Impact	Potential for cumulative impact	Data confidence	Rationale
Loss of habitat	Yes	High	If the construction windows for Boston Barrier and the Facility overlap, there is a potential for cumulative impact.
Noise and lighting impacts on bats and birds	Yes	High	
Displacement of reptiles	Yes	High	

12.8 Transboundary Impacts

12.8.1 There are no transboundary impacts with regards to terrestrial ecology as the Facility is not sited in proximity to any international boundaries.

12.9 Inter-Relationships with Other Topics

12.9.1 This chapter has inter-relationships with **Chapter 9 Landscape and Visual Impact Assessment, Chapter 10 Noise and Vibration and Chapter 17 Marine and Coastal Ecology**.

Table 12.10 Chapter Topic Inter-Relationships

Topic and description	Related Chapter	Where addressed in this Chapter
Landscape and Visual Impact Assessment	9	Lighting impacts to protected species and reinstatement proposals.
Noise and Vibration	10	Noise disturbance to protected species.
Marine and Coastal Ecology	17	Impacts to intertidal and marine habitats and protected species.

12.10 Interactions

12.10.1 The impacts identified and assessed in this chapter have the potential to interact with each other, which could give rise to synergistic impacts because of that interaction. The worst case impacts assessed within the chapter take these interactions into account and for the impact assessments are considered conservative and robust. For clarity, the areas of interaction between impacts are presented in **Table 12.11**, along with an indication as to whether the interaction may give rise to synergistic impacts.

Table 12.11 Interaction Between Impacts

Potential interaction between impacts			
Construction			
	Loss of habitat	Noise and lighting impacts on bats and birds	Displacement of reptiles
Loss of habitat	-	Yes	Yes
Noise and lighting impacts on bats and birds	Yes	-	Yes
Displacement of reptiles	Yes	Yes	-
Operation			
	Loss of habitat	Noise and lighting impacts on bats and birds	Displacement of reptiles
Loss of habitat	-	Yes	Yes
Noise and lighting impacts on bats and birds	Yes	-	Yes
Displacement of reptiles	Yes	Yes	-
Decommissioning			
It is anticipated that the decommissioning impacts will be similar in nature to those of construction.			

12.11 Summary

12.11.1 A summary of the findings for terrestrial ecology is provided in **Table 12.12**.

Table 12.12 Impact Summary

Potential Impact	Receptor	Value/ Sensitivity	Magnitude	Significance	Mitigation	Residual Impact
Construction						
Statutory Designated Sites	Havenside LNR	High	No impact	-	-	No impact
Non-statutory Designated Sites	LWS' (Havenside, South Forty Drain and Slippery Gowt Sea Bank)	Medium	No impact	-	-	No impact
Impacts to habitats	All types	Low	High	Minor adverse	Implementation of landscape mitigation planting. Minimal loss of habitats through site design.	Minor adverse
Impact to badgers	Badgers	Low	No impact	-	Pre-construction surveys to confirm badgers remain absent.	No impact
Impact to water voles	Water voles	High	No impact	-	Updated surveys to confirm water voles remain absent.	No impact
Impact to otters	Otters	High	No impact	-	Updated surveys to confirm otters remain absent.	No impact
Impact to foraging and commuting bats	Bats (foraging and commuting only)	High	High	Major adverse	Pre-construction survey to confirm the presence of bats. Replacement planting of hedgerows that require removal, as part of the landscape mitigation planting strategy.	Moderate adverse

Potential Impact	Receptor	Value/ Sensitivity	Magnitude	Significance	Mitigation	Residual Impact
					All temporary lighting to be designed in line with the BCT Bats and Lighting in the UK guidance (2018). This to include the use of directional lighting during construction; Construction phase lighting will be limited to between 7am-7pm in low light conditions, with lower-level security lighting outside of these times; Ensure that dark corridors remain in place during the construction phase.	
Impacts to reptiles	Reptiles	Medium	High	Moderate adverse	Precautionary methods of working during construction, including tool box talk, habitat manipulation and ecological supervision.	Minor adverse
Impact to bird populations	Bird populations (loss of habitat and in turn loss of nesting opportunities)	Medium	High	Moderate adverse	Removal of vegetation outside of nesting bird season. Pre-work checks for nesting sites if vegetation requires removal during nesting bird season.	Minor adverse
Impact to terrestrial invertebrates	Terrestrial invertebrates	Low	Low	Minor adverse	Integration of habitat for invertebrate species into Facility design (e.g. varied planting regime to provide sheltered elevated temperatures for invertebrates, foraging areas and nectar and pollen for flower-dependent invertebrates)	Minor adverse
Operation						
Disturbance effects associated	Disturbance to Habitats and	High	Negligible	Minor adverse	-	Minor adverse

Potential Impact	Receptor	Value/ Sensitivity	Magnitude	Significance	Mitigation	Residual Impact
Maintenance Activities	Species from Maintenance Activities					
Disturbance to Fauna from Operational Lighting and Noise	Disturbance to Fauna from Operational Lighting and Noise	High	Negligible	Minor adverse	Production and implementation of an Operational Lighting Scheme	Minor adverse
Decommissioning						
No additional impacts on terrestrial ecology are anticipated during the decommissioning phase than those identified during construction.						

12.12 References

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