



Immingham Green Energy Terminal

TR030008

Volume 6

6.2 Environmental Statement

Chapter 5: EIA Process

Planning Act 2008

Regulation 5(2)(a)

Infrastructure Planning (Applications: Prescribed
Forms and Procedure) Regulations 2009 (as
amended)

September 2023

Infrastructure Planning

Planning Act 2008

The Infrastructure Planning
(Applications: Prescribed Forms and
Procedure) Regulations 2009 (as amended)

Immingham Green Energy Terminal

Development Consent Order 2023

6.2 Environmental Statement

Chapter 5: EIA Process

Regulation Reference	APFP Regulation 5(2)(a)
Planning Inspectorate Case Reference	TR030008
Application Document Reference	TR0300008/APP/6.2
Author	Associated British Ports Air Products BR

Version	Date	Status of Version
Revision 1	21 September 2023	DCO Application

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5 EIA Approach

5.1 Introduction

5.1.1 This chapter presents the approach undertaken in the Environmental Impact Assessment (“EIA”) to identify and evaluate the likely significant effects of the Project on the environment and to identify the measures to mitigate or manage any significant adverse effects. The EIA approach has been informed by scoping and consultation with statutory consultees, other interested bodies and members of the public as detailed below.

5.2 EIA Approach and Scope

5.2.1 This Environmental Statement (“ES”) has been prepared to satisfy the requirements of Regulation 14 of *The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017* (“the EIA Regulations”) (as amended) (Ref 5-8).

5.2.2 In undertaking the EIA and preparing the ES (in line with the EIA Regulations) reference has been made to the following policy and guidance in respect of the approach taken for the assessment:

- a. National Policy Statement for Ports (Ref 5-14).
- b. Planning Act 2008: *Guidance on the Pre-Application Process for Major Infrastructure Projects* (Ref 5-12).
- c. Planning Inspectorate Advice Note Three: *EIA Consultation and Notification* (Ref 5-1).
- d. Planning Inspectorate Advice Note Seven: *Environmental Impact Assessment, Preliminary Environmental Information, Screening and Scoping* (Ref 5-2).
- e. Planning Inspectorate Advice Note Nine: *Rochdale Envelope* (Ref 5-3).
- f. Planning Inspectorate Advice Note Ten: *Habitats Regulations Assessment* (Ref 5-4).
- g. Planning Inspectorate Advice Note Twelve: *Transboundary Impacts and Process* (Ref 5-5).
- h. Planning Inspectorate Advice Note Seventeen: *Cumulative Effects Assessment Relevant to National Significant Infrastructure Projects* (Ref 5-6).
- i. Planning Inspectorate Advice Note Eighteen: *The Water Framework Directive* (Ref 5-7).
- j. Institute of Environmental Management and Assessment’s (“IEMA”) *Delivering Proportionate EIA* (Ref 5-9) guidance document.

5.2.3 A summary of the key legislation, policy and guidance against which the Project has been assessed, and which have been considered as part of the EIA of the Project, are set out in **Chapter 4: Legislative and Consenting Framework [TR030008/APP/6.2]**.

Overarching Approach

- 5.2.4 EIA is a process for identifying the likely significant environmental effects (positive and negative) of a proposed project to inform the decision-making process for development consent to be granted.
- 5.2.5 EIA aims to be a systematic, analytical, impartial, consultative and iterative process of identifying, evaluating and mitigating the likely significant environmental effects of a project. It promotes the early identification and evaluation of the likely significant effects and enables appropriate mitigation (that is measured to avoid, reduce or offset significant adverse effects) to be identified and incorporated into the design of the development, or commitments to be made to environmentally sensitive construction methods and practices.
- 5.2.6 The Project design has been refined throughout the EIA process as a result of consultee feedback and progression of the environmental assessments and design development. The EIA recognises that the Project's design will be subject to detailed design and further refinement and optimisation post grant of the development consent order and therefore to ensure the worst-case scenario for the likely significant effects of the Project is assessed in line with the Rochdale Envelope principle, minimum and maximum parameters have been assessed (as appropriate). The Rochdale Envelope principle is explained further in **Section 5.7**.
- 5.2.7 Preparation of this ES has been informed by the *Planning Inspectorate's Advice Note Seven* (Ref 5-2) and reflects that the EIA Regulations require an ES to focus on aspects of the environment likely to be subject to significant effects. Accordingly, this ES, where appropriate and in accordance with the Scoping Opinion, scopes out aspects/matters from further assessment where likely significant effects are not anticipated with suitable justification being provided. This streamlines the assessment process to focus on likely significant effects and ensures it remains proportionate, in accordance with the Institute of Environmental Management and Assessment's ("IEMA") *Delivering Proportionate EIA* (Ref 5-9) guidance document.

5.3 Issues for Consideration in the EIA

- 5.3.1 A scoping exercise was undertaken to determine the extent of issues to be considered in the EIA and reported in the ES. The scoping exercise reported in the Scoping Report (**Appendix 1.A [TR030008/APP/6.4]**) identified the following environmental topics which should be considered in the EIA on the basis that construction, operation and demolition works of the Project could potentially lead to significant effects on the environment. This ES subsequently reports on each of the following environmental topics:
- a. Air Quality.
 - b. Noise and Vibration.
 - c. Nature Conservation (Terrestrial Ecology).
 - d. Nature Conservation (Marine Ecology).
 - e. Ornithology.

- f. Traffic and Transport.
- g. Marine Transport and Navigation.
- h. Landscape and Visual Impact.
- i. Historic Environment (Terrestrial).
- j. Historic Environment (Marine).
- k. Physical Processes.
- l. Marine Water and Sediment Quality.
- m. Water Quality, Coastal Protection, Flood Risk & Drainage.
- n. Climate Change.
- o. Materials and Waste.
- p. Ground Conditions and Land Quality.
- q. Major Accidents and Disasters.
- r. Socio-economics.
- s. Human Health and Well-being.
- t. Cumulative and In-Combination Effects.

5.3.2 The scoping exercise examined whether decommissioning of the Project could result in significant effects within the above environmental topic areas. This concluded that it would be unlikely that the terminal, including the jetty access road, would be decommissioned as these facilities would, once constructed, become part of the Port infrastructure so that they could be used for port-related activities to meet a long-term need. Therefore, decommissioning of the terminal, including the jetty access road, has not been considered further within the ES. However, the hydrogen production facility has a design life of up to approximately 25 years and, although the operational life could be longer, this infrastructure would be decommissioned when appropriate. Decommissioning of the hydrogen production facility is therefore considered within the ES.

5.3.3 The scoping exercise identified the need to undertake a range of other assessments to inform the EIA, and which form part of the DCO application. The following assessments have been undertaken, and coordinated with the ES chapters, to minimise duplication of information between assessments:

- a. **Appendix 2.A: Waste Hierarchy Assessment [TR030008/APP/6.4]** – this assessment has referenced the information gathered as part of the assessment reported in **Chapter 16: Physical Processes** and **Chapter 17: Marine Water and Sediment Quality [TR/030008/APP/6.2]**.
- b. **Appendix 12.A: Navigational Risk Assessment [TR030008/APP/6.4]** – the assessment has referenced the information gathered as part of the assessment reported in **Chapter 12: Marine Transport and Navigation [TR030008/APP/6.2]**.

- c. **Appendix 17.A: Water Framework Directive Compliance Assessment [TR030008/APP/6.4]** – this assessment has referenced the information gathered as part of the assessment reported in **Chapter 17: Marine Water and Sediment Quality** and **Chapter 18: Water Use, Water Quality, Coastal Protection, Flood Risk and Drainage [TR030008/APP/6.2]**.
- d. **Appendix 18.A: Flood Risk Assessment [TR030008/APP/6.4]** – this assessment has referenced the information gathered as part of the assessment reported in **Chapter 18: Water Use, Water Quality, Coastal Protection, Flood Risk and Drainage [TR030008/APP/6.2]**.
- e. **Shadow Habitats Regulations Assessment (“HRA”) [TR030008/APP/7.6]** – this assessment has referenced the information gathered as part of the ornithology assessment reported in **Chapter 10: Ornithology [TR/030008/APP/6.2]**.
- f. **Without Prejudice Shadow Habitats Regulations Assessment (HRA) Derogation Report [TR030008/APP/7.3]** – this report is provided on a without prejudice basis and presents the case for derogation from the Habitats Directive, should Natural England consider that there is an adverse effect on integrity of the European Marine Site.
- g. **Marine Plan Conformance Assessment**– this assessment, which forms Appendix B of the **Planning Statement [TR030008/APP/7.1]**, has referenced information presented in this ES.

5.4 Scoping Opinion

- 5.4.1 The Applicant made a request to the Planning Inspectorate, (acting on behalf of the Secretary of State) on 30 August 2022, to obtain its written opinion on the scope and level of detail of the information to be provided in the ES, under Regulation 10(1) of the EIA Regulations (Ref 5-8).
- 5.4.2 The request was accompanied by the **EIA Scoping Report** (provided in **Appendix 1.A [TR030008/APP/6.4]**, which provided the information required by Regulation 10(3) of the EIA Regulations (Ref 5-8).
- 5.4.3 The Planning Inspectorate provided its **Scoping Opinion** on 10 October 2022 (**Appendix 1.B [TR030008/APP/6.4]**), which took account of the content of the EIA Scoping Report and the responses received from the consultation bodies engaged.
- 5.4.4 The Scoping Opinion confirmed agreement with the majority of the proposed EIA scope but highlighted a number of additional matters requiring consideration, which are detailed in the section below. **Appendix 1.C [TR030008/APP/6.4]** provides a summary of how issues raised in the Scoping Opinion by the Inspectorate and by consultees have been addressed in the ES.

5.5 Modifications to the EIA Scope

Scoping Opinion Outcomes

- 5.5.1 Matters raised within the **Scoping Opinion (Appendix 1.B [TR030008/APP/6.4])** were reviewed against the content of the EIA Scoping Report (provided in **Appendix 1.A [TR030008/APP/6.4])** to identify where changes to the approach and/or further survey and assessment were necessary.
- 5.5.2 The scope of the EIA was accordingly modified by the Applicant to take account of the requirements of the scoping opinion, fulfilling its obligation under Regulation 14(3) of the EIA Regulations (Ref 5-8) in relation to the ES having to be based on the most recent scoping opinion adopted.
- 5.5.3 Full details of how the EIA scope was modified in response to the Scoping Opinion are presented in **Appendix 1.C [TR030008/APP/6.4]**. The following sub-sections detail the other stages which have influenced the EIA scope.

Engagement Outcomes

- 5.5.4 Following receipt of the **Scoping Opinion (Appendix 1.B [TR030008/APP/6.4])** engagement continued with statutory and non-statutory bodies through a combination of two rounds of statutory consultation, written correspondence and meetings, the purpose of which was to obtain further views and opinions on the Project and EIA aspects. This included the scope of work being undertaken, the methodologies being followed, the prediction and assessment of impacts and effects, the development of mitigation measures, and requirements for monitoring significant environmental effects.
- 5.5.5 The outcomes of engagement, including how feedback has been addressed, are summarised in **Chapters 6 to 24 [TR030008/APP/6.2]** and considered in detail in the **Consultation Report [TR030008/APP/5.1]**. Statutory consultation outcomes did not identify the need to introduce any new topics to those previously identified in the Scoping Report.
- 5.5.6 Full details of the engagement undertaken during the EIA process, the responses received and how those responses have been taken into account are presented within the **Consultation Report [TR030008/APP/5.1]**.

Publication of New Guidance

- 5.5.7 Subsequent to receipt of the **Scoping Opinion (Appendix 1.B [TR030008/APP/5.4])** new assessment guidance relating to certain topics under consideration in the EIA was published. The Applicant has accordingly reviewed any new changes introduced by this new guidance against the approach presented in the Scoping Report and has given this due regard when undertaking the EIA. Where this is applicable, and to avoid duplication, this is described within the relevant technical chapters of the ES.

Design-development Outcomes

- 5.5.8 Continued development of the Project design during the EIA has resulted in a number of changes which have influenced the scope of the individual assessments progressed following publication of the **Scoping Opinion (Appendix 1.B [TR030008/APP6.4])**. Additional data collection, modelling and assessment have been undertaken and reported in the ES to address the changes, however none of the changes to the Project affect the conclusions reached on the scope of the ES as set out within the Scoping Opinion.
- 5.5.9 Refinements have been made to the engineering and environmental design of the Project in response to:
- a. The outcome of statutory consultation.
 - b. The outcome of non-statutory consultation with external stakeholders and bodies, outside of the statutory consultation process. This includes the views expressed by statutory and non-statutory bodies, landowners and utility companies.
 - c. The EIA process, whereby the result of environmental baseline surveys and assessments of likely significant effects have iteratively informed the Project design.
- 5.5.10 **Chapter 3: Need and Alternatives [TR030008/APP/6.2]** describes how the design of the Project has developed since undertaking the scoping exercise, and how the considerations have influenced its final form. The **Planning Statement [TR030008/APP/7.1]** submitted with the Development Consent Order (“DCO”) application also provides details of the Project design evolution.
- 5.5.11 The Scoping Opinion, and the advice contained within it regarding assessment methodology, topics and presentation of the ES, together with responses received through consultation and engagement, the design development outcomes, and any new guidance, have been taken into account in the preparation of this ES.
- 5.6 Environmental Statement
- 5.6.1 This ES presents a description of the Project and its likely significant environmental effects during construction, operation (including maintenance where relevant) and decommissioning (of the hydrogen production facility). It also details measures to avoid or reduce or offset such effects and the alternatives considered.
- 5.6.2 For the purposes of the EIA, the full capacity of the jetty, of up to 292 vessel calls per year, has been assessed in this ES. Similarly, the landside infrastructure required to transport ammonia from the jetty, store and convert it into green hydrogen is also assessed for the phased build out of the operational development (all six phases) and decommissioning. **Chapter 2: The Project [TR030008/APP/6.2]** provides a full description of the Project.
- 5.6.3 This ES summarises the outcome of the following EIA activities:
- a. Establishing baseline conditions.

- b. Consultation with statutory and non-statutory consultees.
- c. Consideration of relevant local, regional and national planning policies, guidelines and legislation relevant to the EIA.
- d. Consideration of technical standards for the development of significance criteria and specialist assessment methodologies.
- e. Design review.
- f. Review of previous environmental studies, publicly available information, desktop studies and online databases.
- g. Expert opinion.
- h. Physical surveys and monitoring.
- i. Desk-top studies.
- j. Modelling and calculations.

5.6.4 These activities have enabled the prediction of impacts in relation to the current and future baseline, and a prediction based on the information available of the likely significance of effects due to the Project on environmental receptors.

5.6.5 The term 'impact' refers to changes arising from the Project on a resource or receptor, whereas the term 'effect' is used to describe the consequence of the impact on a resource or receptor.

5.6.6 Resources comprise environmental aspects which support and are essential to natural or human systems. These include areas or elements of population, ecosystems, watercourses, air and climatic factors, landscape, and material assets.

5.6.7 Receptors comprise people, for example occupiers of dwellings, users of recreational areas and community facilities, and elements within the environment, for example flora and fauna, that rely on environmental resources.

5.6.8 Each technical chapter within this ES (**Chapters 6 to 24 [TR030008/APP/6.2]**) follows the same structure for ease of reference:

- a. Introduction.
- b. Consultation and Engagement (including scoping and statutory consultation responses).
- c. Legislation, policy and guidance.
- d. Assessment method.
- e. Study area.
- f. Baseline conditions.
- g. Development design and impact avoidance.
- h. Potential impacts and effects.
- i. Mitigation measures.
- j. Assessment of Residual effects.

- k. Summary of assessment.
- l. References.
- m. Abbreviations and glossary of terms.

Statement of Competence

- 5.6.9 To ensure the completeness and quality of the ES, Regulation 14(4)(a) of the EIA Regulations requires the ES to be undertaken by competent experts.
- 5.6.10 A statement of competence of the EIA coordinators and the technical specialists that have provided expert input to the ES is included as **Appendix 1.D [TR030008/APP/6.4]** to satisfy Regulation 14(4)(b) of the EIA Regulations.

5.7 Rochdale Envelope Parameters and Managing Design Uncertainty

- 5.7.1 The design of large infrastructure projects such as the Project necessarily evolves to respond to design challenges, stakeholder views and the findings of the EIA process.
- 5.7.2 Following submission of the DCO Application, the design of the Project is expected to continue to develop in the lead-in to the DCO Application examination, and will be further refined up until the start of construction (subject to authorisation by the Secretary of State). In order to account for these possible future changes (and particularly for post consent changes) in the EIA process, it has been necessary to make a number of assumptions about what is termed a 'reasonable worst-case'.
- 5.7.3 Design uncertainty is addressed within the EIA by adopting a precautionary approach to identifying significant environmental effects, through the establishment of a series of maximum and minimum development parameters which constitute that has become known as a 'Rochdale Envelope'.
- 5.7.4 The Rochdale Envelope arises from United Kingdom ("UK") case law (Ref 5-10). It is an established principle that allows a number of parameters to be set to establish an envelope within which the Project would be delivered. Its adoption allows robust EIA to be undertaken by defining a reasonable worst-case scenario that decision-makers can consider when determining the acceptability or otherwise of the environmental effects of the Project.
- 5.7.5 The principle is founded on the assumption that, as long as the technical and engineering design of a project falls within the limits of the envelope defined by these parameters (including geographical and technical limits), and the EIA has considered the likely significant effects of a project coming forward within that envelope (based on the reasonable worst-case scenario), then flexibility within those parameters is deemed to be permissible within the terms of any consent granted for the Project.

- 5.7.6 The reasonable worst-case scenario assumes that one or other of the parameters would have a more significant adverse effect than the alternative, and where a range of parameters is provided, the most environmentally detrimental parameter is assessed in the EIA. The worst-case scenario can differ between the environmental topics being assessed, and the environmental resources or receptors potentially affected.
- 5.7.7 Advice published by the Planning Inspectorate (Ref 5-3) fully endorses the approach of assessing design uncertainty, whilst still meeting the requirements of the EIA Regulations.
- 5.7.8 In line with this approach, parameters have been established across aspects relating to the design and construction of the Project to manage design uncertainty and provide flexibility for deviation where needed. For example, flexibility may be needed to enable minor design refinements to be made during construction by the appointed contractor within the overall parameters of any consent granted and which would not produce different significant effects to those as reported within this ES.
- 5.7.9 This approach to managing uncertainty within defined parameters and limits (as set out in **Chapter 2: The Project [TR030008/APP/6.2]**) ensures that the likely significant environmental effects of the final design or any design changes that may arise post submission of the DCO Application have been assessed by the EIA.
- 5.8 **Defining Study Areas: Spatial Scope of Assessment**
- 5.8.1 The study area (or ‘the spatial scope’) for each environmental aspect, the area over which changes to the environment are predicted to occur as a consequence of the Project, depends on the nature of the potential impacts and the location of receptors that could be affected. Study areas take account of:
- The physical area and characteristics of the Project.
 - The nature of the existing and future baseline environment.
 - The manner and extent to which environmental impact may occur.
- 5.8.2 Each individual technical assessment of this ES (**Chapters 6 to 24 [TR030008/APP/6.2]**) defines the study area considered and provides a rationale to support its selection, including consideration of the current baseline conditions such as the presence of any sensitive features and/or designations within, or adjacent to, the proposed study area.
- 5.8.3 The Site Boundary, as illustrated on **Figure 1.1 [TR030008/APP/6.3]**, has been assessed within this ES.

5.9 Temporal Scope

- 5.9.1 The temporal scope covers the time period over which changes to the environment and the resultant effects are predicted to occur, and are typically defined as either being permanent or temporary:
- Permanent – these are effects that would remain even when the Project is complete, although these effects may be caused by environmental changes that are permanent or temporary.
 - Temporary – these are effects that are related to environmental changes associated with a particular activity and that would cease when that activity finishes.
- 5.9.2 The assessment evaluates the environmental effects of the phased approach to construction and operation as summarised in **Table 2-1** of **Chapter 2: The Project [TR030008/APP/6.2]**.
- 5.9.3 As stated in **Section 2.1** of **Chapter 2: The Project [TR030008/APP/6.2]**, consideration of effects from decommissioning of the Project are considered within the EIA where necessary (i.e. in relation to the hydrogen production facility).
- ## 5.10 Characterisation of the Existing and Future Baseline Environment
- 5.10.1 To assess the potential environmental effects resulting from the Project, it is necessary to first establish the environmental conditions that currently exist within the Site Boundary and the surrounding vicinity, where relevant.
- 5.10.2 Appropriate understanding of the baseline for each technical environmental discipline has been collated through some or all of the following:
- Review of secondary sources (desk-based i.e. review of existing documentation and literature; data searches and available datasets).
 - Review of primary baseline studies (field surveys).
 - Stakeholder consultation.
- 5.10.3 Existing baseline conditions have been defined for each technical assessment topic in **Chapters 6 to 24 [TR/030008/APP/6.2]** based on the data sources detailed in the paragraph above (as applicable). It is also important to consider future baseline conditions (in the absence of the Project) against which the effects of the Project can be assessed.
- 5.10.4 The key data sources used to establish baseline conditions are described in each technical assessment chapter (**Chapters 6 to 24 [TR030008/APP/6.2]**).

Baseline Conditions (including Future Baseline)

- 5.10.5 The 'existing baseline' date is 2022/2023 since this is the period in which the baseline studies have been undertaken as part of the EIA process. The baseline used within the Preliminary Environmental Information Report was 2022. Further survey work for the Project to further define baseline conditions has been undertaken in early 2023. Exceptions to this are outlined within the individual baseline sections of the technical ES chapters.
- 5.10.6 'Future baseline' conditions are also predicted for each assessment scenario; these represent the likely conditions anticipated to prevail at a certain point in the future in the absence of the Project.
- 5.10.7 The assessment scenarios that have been considered for the purposes of the EIA (and addressed in this ES) are:
- a. Existing baseline (2022/2023).
 - b. Future baseline (No Development) (up to Quarter (Q) 1 2025 (anticipated start of construction), 2026 for Traffic and Transport, Air Quality and Noise and Vibration, and 2042 for landscape and visual effects only, and 2060 (in relation to the assessment of decommissioning impacts) against which the environmental effects of the Project are assessed. These assessment years are explained below. The future baseline is defined within each technical chapter (**Chapters 6 to 24 [TR030008/APP/6.2]**).
 - c. Construction: subject to the necessary consents being granted, construction of the Project is anticipated to start in Q1 2025 with the construction of the terminal and first phase of the green hydrogen production facility (including works on both the East and West Site). Following completion of the first phase of the hydrogen production facility, a further five phases would be constructed incrementally to increase the processing capacity as the market for green hydrogen increases. For the purposes of this ES, a development scenario has been defined for the Project. This scenario is based on a six-phase construction timeline commencing in Q1 of 2025, through to full completion of all phases in 2036 (see **Chapter 2: The Project [TR030008/APP/6.2]**).
 - d. Opening and/or operation: assuming an approximate 11-year construction programme for the full development (all six phases), followed by a period of commissioning for each construction phase, commercial operation of phase 1 is likely to commence between Q1 and Q4 2027, following a two and a half to three-year construction period. The assessment years within each technical assessment have been chosen as the reasonable worst-case for each topic to ensure effects are considered when they are at the greatest magnitude of impact

- e. Decommissioning: it is envisaged that the landside elements (the hydrogen production facilities) of the Project would have an operational life of approximately 25 years. On this basis, decommissioning activities of these landside elements are currently anticipated to commence after 2060. However, the operational life of the landside elements of the Project could be longer, depending on its integrity and market conditions at that time. The marine infrastructure would not be decommissioned.

- 5.10.8 A future year of 2042 (i.e. 15 years post-opening of the Project) is also considered by specific topics, including landscape and visual amenity to take account of the maturation of mitigation landscape planting.

5.11 Environmental Mitigation

Design Development, Impact Avoidance and Mitigation

- 5.11.1 The Project design development process has been heavily influenced by the findings and feedback obtained throughout the EIA and consultation process. The Project has had a number of measures incorporated into the concept design to avoid or minimise environmental impacts. The key aspects of the Project design which have evolved through design development, and in response to statutory consultation, are described in the **Planning Statement [TR030008/APP/7.4]** and in **Chapter 2: The Project** and **Chapter 3: Need and Alternatives [TR030008/APP/6.2]**. These include legal compliance measures, as well as measures that implement the requirements of best practice guidance documents (e.g., Environment Agency guidelines on pollution prevention). The assessments have been undertaken on the basis of these measures being implemented (e.g., they are 'embedded mitigation').

Environmental Measures

- 5.11.2 Consistent with Regulation 14(2)(c) of the EIA Regulations (Ref 5-8), the ES includes a description of the “...*measures envisaged in order to avoid, prevent or reduce and, if possible, offset likely significant adverse effects on the environment*”.
- 5.11.3 For each environmental topic the EIA process has systematically identified impacts and effects; and has taken into consideration environmental measures that the Project would adopt. These measures, which are reported throughout the technical chapters of this ES, include avoidance, best practice and design commitments as follows:
- a. *Embedded mitigation measures*: modifications to the location, design or operation of a development that are an inherent part of the Project and do not require additional action to be taken.
 - b. *Standard mitigation measures*: measures comprising management activities and techniques, which would be implemented during construction of the Project to limit impacts through adherence to good site practice and achieving legal compliance. These measures for the construction phase are set out in the **Outline Construction Environmental Management Plan (“CEMP”)** [TR030008/APP/6.4].

- c. *Additional mitigation measures:* these comprise measures over and above any embedded and standard mitigation measures, for which the EIA has identified a requirement to further reduce likely significant environmental effects.
- 5.11.4 Implementation of embedded, standard and additional mitigation measures relied on in the assessment are outlined in the **Schedule of Mitigation and Monitoring [TR030008/APP/7.2]** and where relevant, these are proposed to be secured through the schedules and requirements contained within the **draft DCO [TR030008/APP/2.1]**.
- 5.11.5 The assessment presented in the technical chapters of this ES firstly takes into account the effectiveness of both embedded mitigation and standard mitigation measures, as these comprise measures that would be delivered as an integral component of the design of the Project and through the application of best practice construction techniques during its construction. Embedded and standard mitigation measures are identified within the ‘Design Development and Impact Avoidance’ sections of each technical chapter of this ES.
- 5.11.6 Once the likely significant effects have been identified and quantified, consideration has been given to any ‘additional mitigation’ over and above the embedded and standard mitigation. Where significant effects remain following the implementation of embedded and standard mitigation, and additional mitigation could lower the identified effect, each technical chapter of this ES has identified this and explains how the additional mitigation will be secured, for example, via a specific DCO requirement or a via a management plan or a document secured by a DCO requirement.
- 5.11.7 When environmental measures form an integral part of the Project design (i.e. embedded mitigation and standard mitigation) and/or the approach to its construction, the assessment of likely significant effects only reports the post-mitigation effects within this ES. Due to topic specific guidance, some assessments deviate from this standard approach. When this is the case it is outlined in individual topic assessments as appropriate.
- 5.11.8 Where additional mitigation measures are identified, the ES reports both pre- and post-mitigation effects in order to demonstrate their efficacy in further reducing the significance of effects and explains how such measures will be secured.
- 5.11.9 Following the identification of additional mitigation measures, the assessment of effect significance is re-evaluated to determine whether there is likely to be a residual effect and if it remains significant. Residual effects assessed as Moderate or Major after consideration of mitigation measures have been subject to additional analysis of the potential to further mitigate them, where feasible. Where additional mitigation is not possible a significant residual effect may remain.

5.11.10 Where significant residual effects are predicted, proportionate monitoring measures have been identified in accordance with the requirements of Schedule 4 of the EIA Regulations (Ref 5-8). Details of the monitoring procedures to be implemented during and post-construction of the Project are presented in the **Outline CEMP [TR030008/APP/6.5]** and the **Schedule of Mitigation and Monitoring [TR030008/APP/7.2]**, which are included in the DCO Application.

5.12 Environmental Effects

5.12.1 Within this ES, environmental effects are defined as arising as a result of impacts (changes brought about by the Project) which act upon receptors (or resources). As an example, a change in air quality generated by the development would be an impact and the response at the receptor, such as a habitat, which may decline in value as a result of the change in air quality, would be the environmental effect. For an effect to occur there has to be a pathway between the impact and the resource or receptor.

5.12.2 In the EIA, effects are formulated as a function of the importance, value or sensitivity of an environmental resource or receptor, and the magnitude of impact (or change) predicted. A combination of professional judgement, defined thresholds, established criteria and standards are used in the definition of effects within this ES.

5.12.3 The significance criteria presented in **Section 5.13** of this chapter have been used to report the significance of effects, the assignment of which relies on reasoned argument, professional judgement, established thresholds and guidelines, and the views of relevant organisations.

5.12.4 Account is taken of the role of mitigation measures, as discussed in **Section 5.11**, in reducing the significance of adverse effects.

5.13 Significance Criteria

5.13.1 For consistency, the methodology described in this section has been applied across the assessed environmental topics included within this ES (**Chapters 6 to 24 [TR030008/APP/6.2]**) to ensure the predicted environmental effects are assessed and evaluated in a comparable manner.

5.13.2 Variations from this approach are applicable to specific environmental topics where other prevailing standards, thresholds and/or established criteria exist that require application. Where this is the case, an outline is provided in the applicable technical assessment chapters of the ES **[TR030008/APP/6.2]**:

- a. **Chapter 12: Marine Transport and Navigation**
- b. **Chapter 13: Landscape and Visual Impact**
- c. **Chapter 19: Climate Change**
- d. **Chapter 20: Materials and Waste**
- e. **Chapter 22: Major Accidents and Disasters**
- f. **Chapter 24: Human Health and Well-being**

5.13.3 **Table 5-1** presents the generic guidelines for the sensitivity (or importance/value) of a resource or receptor that have been applied within this ES.

Table 5-1: Generic Guidelines for the Assessment of Receptor Sensitivity

Sensitivity (or importance/value)	Typical Descriptors
High	The resource or receptor has a very low capacity to accommodate the proposed form of change without fundamentally altering its present character; possesses key characteristics which contribute significantly to the distinctiveness, rarity and character of the site or receptor; is of international or national importance.
Medium	The resource or receptor has a low capacity to accommodate the proposed form of change without significantly altering its present character; possesses key characteristics which contribute significantly to the distinctiveness and character of the site or receptor; is of regional or county importance.
Low	The resource or receptor has some tolerance to accommodate the proposed change without detriment to its character; possesses characteristics which are locally significant; is either not designated or is designated at a local or district level.
Very Low	The resource or receptor is generally tolerant and can accommodate the proposed change without detriment to its character; resource or receptor characteristics; does not make a significant contribution to local distinctiveness; and is not designated.

5.13.4 **Table 5-2** presents the generic magnitude of impact (or change) criteria that have been applied within this ES.

Table 5-2: Generic Guidelines for Determining the Magnitude of Impact (or change)

Magnitude of Impact (or change)	Typical Descriptors
High	The total loss or major change/substantial alteration to key elements/features of the current (pre-development) baseline conditions, such that the character/composition/attributes of the baseline would be fundamentally changed post-development.
Medium	Loss or alteration to one or more key elements/features of the current (pre-development) baseline conditions, such that the character/composition/attributes of the baseline will be materially changed post-development.
Low	Noticeable or small-scale change in character/composition/attributes of the current (pre-development) baseline conditions. Change arising would be discernible/detectable but not material post-development.

Magnitude of Impact (or change)	Typical Descriptors
Very Low	Very small-scale change or barely discernible changes in character/composition/attributes of the current (pre-development) baseline conditions post-development.

- 5.13.5 Once the magnitude of impact (or change) and the sensitivity of the receptor has been established, the significance of an effect can be assessed. Development proposals affect different environmental elements to varying degrees and not all of these are of sufficient concern to warrant detailed investigation or assessment within the EIA process. The EIA Regulations (Ref 5-8) identify those environmental resources that warrant investigation as those that are “*likely to be significantly affected by development*” (Schedule 4(4)).
- 5.13.6 The identification of effect significance typically requires the application of professional judgement; however, the overarching significance matrix used in the EIA is shown in **Table 5-3**. The generic definitions that have been used to determine the level of effect significance are shown in **Table 5-4**. Reference is made to:
- ‘Major’ and ‘moderate’ effects, which would always be determined as being significant.
 - ‘Minor’ or ‘negligible’ effects, which would always be deemed as ‘not significant’.
 - Effects can be beneficial or adverse.

Table 5-3: Generic Significance Evaluation Matrix

		Magnitude of Change			
		Very Low	Low	Medium	High
Sensitivity of Receptor	High	Minor	Moderate	Major	Major
	Medium	Minor	Minor	Moderate	Major
	Low	Negligible	Minor	Minor	Moderate
	Very Low	Negligible	Negligible	Minor	Minor

Table 5-4: Generic Significance of Effect Description

Significance Category	Indicative Description
Major	Very large or a large change in environmental conditions. Effects, both negative and positive, which are likely to be important considerations at a national to regional level because they contribute to achieving national or regional objectives, or which are likely to result in exceedance of statutory objectives or breaches of legislation. These effects are considered to be very important considerations and are likely to be material in the decision-making process.
Moderate	Intermediate change in environmental conditions. Effects are likely to be important considerations at a regional or at a local level and important in informing the decision-making process.
Minor	Small change in environmental conditions that are unlikely to be material in the decision-making process.
Negligible	No discernible change in environmental conditions. An effect that is likely to have a neutral or negligible influence.

5.13.7 In subsequent chapters of this ES (**Chapters 6 to 24 [TR030008/APP/6.2]**) the general criteria described above have been made more topic-specific for each environmental topic based on relevant standards and guidelines. Further explanation of the approach to assessing impacts and effects, and the specific criteria used for each topic is set out in each chapter, with any deviation from this standard approach noted.

5.14 Cumulative and In Combination Effects

5.14.1 As required by the EIA Regulations, consideration has been given to the potential for cumulative and combined effects to arise as a result of the Project.

5.14.2 Cumulative effects are those that accrue over time and space from a number of development activities. The impact of the Project has been considered in conjunction with the potential impacts from other projects or activities which are reasonably foreseeable in terms of delivery. This includes projects for which applications for development consent and/or planning permission have been submitted, but have not yet been approved and projects that have planning permission or development consent that are located within a geographical scope (and where sufficient environmental information is available) where environmental impacts could act together with the Project to create a more significant overall effect on a receptor.

5.14.3 In-combination (or combined) effects are those resulting from a single development, in this case the Project, on any one receptor that may collectively cause a greater effect (such as the combined effects of noise and air quality/dust impact during construction on local residents).

- 5.14.4 The approach to the assessment of cumulative and in-combination effects takes into account guidance contained within Planning Inspectorate *Advice Note Seventeen: Cumulative Effects Assessment Relevant to Nationally Significant Infrastructure Projects* (Ref 5-6), which provides advice on the identification and assessment of other planned developments. **Chapter 25: Cumulative and In-Combination Effects [TR030008/APP/6.2]** presents the findings of the assessment.
- 5.15 Transboundary Effects
- 5.15.1 Regulation 32 of the EIA Regulations and the Planning Inspectorate *Advice Note Twelve: Transboundary Impacts and Process* (Ref 5-5) and specifically Annexes A and B, set out the criteria and relevant considerations to be taken into account by the Planning Inspectorate when screening Nationally Significant Infrastructure Project (“NSIPs”) for likely significant effects on the environment on European Economic Area (“EEA”) states.
- 5.15.2 The Planning Inspectorate, on behalf of the Secretary of State, issued a first transboundary screening assessment on 2 March 2023 (Ref 5-13) following the Applicant’s request for a scoping opinion. The Inspectorate’s assessment concluded that the Project is likely to have a significant effect on the environment in an EEA state. This was found to be applicable to Denmark and Iceland, given that the features of the Humber Estuary Special Protection Area (“SPA”) include the following species associated with populations in Denmark and Iceland:
- a. Red knot comprising 6.3% of the Northeastern/Canada/Greenland/Iceland/North western Europe populations.
 - b. Black-tailed godwit comprising 2.6 - 3.2% of the Icelandic breeding population.
- 5.15.3 The Inspectorate also stated that qualifying features of the Humber Estuary Ramsar site include the following species associated with populations in Denmark and Iceland:
- a. Golden plover representing 2.2% of the Iceland and Faroes/East Atlantic population.
 - b. Black-tailed godwit comprising 3.2% of the Iceland/West Europe populations.
- 5.15.4 Therefore the states of Denmark and Iceland have been notified of the Project by the Inspectorate.
- 5.15.5 However, based on the evidence and assessment provided within this ES (see **Chapter 10: Ornithology [TR030008/APP/6.2]** and the **HRA [TR030008/APP/7.6]**), effects on EEA states, including Denmark and Iceland, are not predicted to occur as a result of effects from the Project on the relevant qualifying features of the SPA and Ramsar, as the Project’s effects are predicted to be localised and not significant.

5.16 Consultation and Engagement

- 5.16.1 The Project has a wide range of stakeholders with differing interests that have been consulted. Specific communication activities have been undertaken to meet the needs of specific individuals and groups, based on an understanding of the stakeholders and their interests in the Project.

Pre-application Consultation

- 5.16.2 Pre-application consultation has been undertaken to seek the views of statutory consultees, the local community and other interested groups and individuals and individuals on the Project proposals which have been developed. Two rounds of statutory consultation have been undertaken in accordance with the requirements of the *Planning Act 2008* (“2008 Act”) (Ref 5-11), the EIA Regulations (Ref 5-8) and the Infrastructure Planning (Applications: Prescribed Forms and Procedures) Regulations 2009 (“APFP Regulations”) (Ref 5-20).
- 5.16.3 The Applicant has undertaken pre-application consultation with a range of prescribed consultees. Key stakeholders that have been consulted as part of the pre-application process include:
- Prescribed statutory bodies.
 - Local authorities.
 - Landowners/those with interests in the land.
 - Local communities.
 - Other key interest groups.
- 5.16.4 Consultation and engagement with stakeholders has helped to inform the preparation of key materials as part of the EIA.
- 5.16.5 A Consultation Report **[TR030008/APP/5.1]** forms part of the DCO Application and summarises how pre-application consultation was undertaken and how feedback received, including the feedback on the statutory consultation, was taken into account by the Applicant. Each of the technical chapters of the ES (**Chapters 6 to 24 [TR030008/APP/6.2]**) summarise the consultation comments relevant to the topic chapter and the corresponding response.

Technical Engagement

- 5.16.6 In addition to the stages of pre-application consultation, the Applicant has held informal engagement with the key prescribed consultees, as appropriate, to refine the Project design and the EIA and to assist in the development of any required mitigation or other environmental measures. Specific information on this is presented in the environmental topic chapters (**Chapters 6 to 24 [TR030008/APP/6.2]**).

5.16.7 A summary of technical stakeholder engagement is provided within the individual technical chapters within this ES. In addition, the Applicant will seek to agree Statements of Common Ground (“SOCG”) with key stakeholders to set out matters that have been agreed prior to the examination of the DCO Application.

5.17 Assumptions and Limitations

5.17.1 In addition to the use of the Rochdale Envelope principles to manage design uncertainty, a number of general limitations have been encountered when undertaking the EIA, noting that these do not necessarily apply universally to each technical ES chapter. These have influenced how data collection, modelling and assessment have been progressed and reported in the ES. Each technical chapter of the ES (**Chapters 6 to 24 [TR030008/APP/6.2]**) sets out any assumptions made, and limitations encountered whilst undertaking and reporting their respective assessments.

5.18 References

- Ref 5-1 The Planning Inspectorate (2017). Advice Note Three: EIA Consultation and Notification (Version 7).
- Ref 5-2 The Planning Inspectorate (2020). Advice Note Seven: Environmental Impact Assessment, Preliminary Environmental Information, Screening and Scoping (Version 7).
- Ref 5-3 The Planning Inspectorate (2018). Advice Note Nine: Rochdale Envelope (Version 3).
- Ref 5-4 The Planning Inspectorate (2022). Advice Note Ten: Habitats Regulations Assessment Relevant to Nationally Significant Infrastructure Projects (Version 9).
- Ref 5-5 The Planning Inspectorate (2020). Advice Note Twelve: Transboundary Impacts and Process (Version 6).
- Ref 5-6 The Planning Inspectorate (2019). Advice Note Seventeen: Cumulative Effects Assessment (Version 2).
- Ref 5-7 The Planning Inspectorate (2017). Advice Note Eighteen: The Water Framework Directive (Version 1).
- Ref 5-8 UK Government (2017). The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017.
- Ref 5-9 IEMA (2017). Delivering Proportionate EIA.
- Ref 5-10 R.V. Rochdale MBC ex parte Milne (No. 1); and R. V. Rochdale MBC ex parte Tew [1999] and R. v. Rochdale MBC ex parte Milne (No. 2) [2000].
- Ref 5-11 UK Government (2008). Planning Act 2008.
- Ref 5-12 Department for Communities and Local Government (March 2015). Planning Act 2008: Guidance on The Pre-Application Process for Major Infrastructure Projects.
- Ref 5-13 Planning Inspectorate (2023) Transboundary screening undertaken by the Planning Inspectorate (the Inspectorate) on behalf of the Secretary of State (SoS) for the purposes of Regulation 32 of The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (the EIA Regulations)
- Ref 5-14 Department for Transport (2012) National Policy Statement for Ports
- Ref 5-15 The European Community (1992). Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora (the 'Habitats Directive')

Ref 5-16 European Parliament (2009). Directive 2009/147/EC of the European Parliament and of the Council.

Ref 5-17 UK Government (2017). The Conservation of Habitats and Species Regulations 2017.

Ref 5-18 Environment Agency (2017) Water Framework Directive assessment: estuarine and coastal waters.

Ref 5-19 Department for Environment, Food and Rural Affairs (Defra) (2011). Guidance on applying the Waste Hierarchy.

Ref 5-20 UK Government (2009) The Infrastructure Planning (Applications: Prescribed Forms and Procedures) Regulations 2009