The Great Grid Upgrade

North Humber to High Marnham

Preliminary Environmental Information Report

Volume 1: Chapter 5 Approach to Preparing the PEIR

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Contents

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5. Approach to Preparing the PEIR

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5. Approach to Preparing the PEIR

5.1 Introduction

5.1.1 This chapter describes the approach and general methodology which will be used to assess the potential likely significance of effects on the natural, human and built environment because of the Project, as informed by the Scoping Opinion (Ref 5.1) within the Environmental Statement (ES). This chapter also describes the methodology which has been used to undertake the preliminary assessments which are presented in the topic chapters (**Chapters 6 to 21**) of this Preliminary Environmental Information Report (PEIR).

5.1.2 Regulation 12(2) of The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (Ref 5.2), the EIA Regulations defines the Preliminary Environmental Information (PEI) as information that has been compiled by the applicant and

'*(b) is reasonably required for the consultation bodies to develop an informed view of the likely significant environmental effects of the development (and of any associated development)*'.

5.1.3 In relation to the format and presentation of PEI, paragraph 8.4 of the Planning Inspectorate's Advice Note Seven (Ref 5.3) states that:

'*There is no prescribed format as to what PEI should comprise and it is not expected to replicate or be a draft of the ES. However, if the Applicant considers this to be appropriate (and more cost-effective) it can be presented in this way. A good PEI document is one that enables consultees (both specialist and non-specialist) to understand the likely environmental effects of the Proposed Development and helps to inform their consultation responses on the Proposed Development during the pre-application stage*'.

5.1.4 This PEIR has not been presented as a draft ES. It does, however, provide details of the information gathered to date and the assessment work undertaken at this stage in sufficient detail to help inform the statutory consultation process.

5.1.5 The PEI presented in this PEIR provides preliminary assessments undertaken for each environmental topic to inform statutory consultation. Each chapter outlines methodology, baseline, mitigation and residual effects (including a prediction of likely significant effects) informed by the Environmental Impact Assessment (EIA) Scoping Report (Ref 5.4) and Scoping Opinion (Ref 5.1).

5.1.6 All conclusions and assessments presented within this PEIR are preliminary and are based on the description of the Project and assumptions presented in **Chapter 4 Description of the Project**. All assessment work has applied, and will continue to apply, a precautionary principle, in that where limited information is available (in terms of the Project detail) a realistic worst-case scenario is assessed.

5.1.7 The PEIR sets out the level of work undertaken to reach the preliminary conclusion as to whether there are likely to be significant effects for each aspect scoped into the EIA. It also outlines any further work that will be undertaken and presented in the ES to validate conclusions.

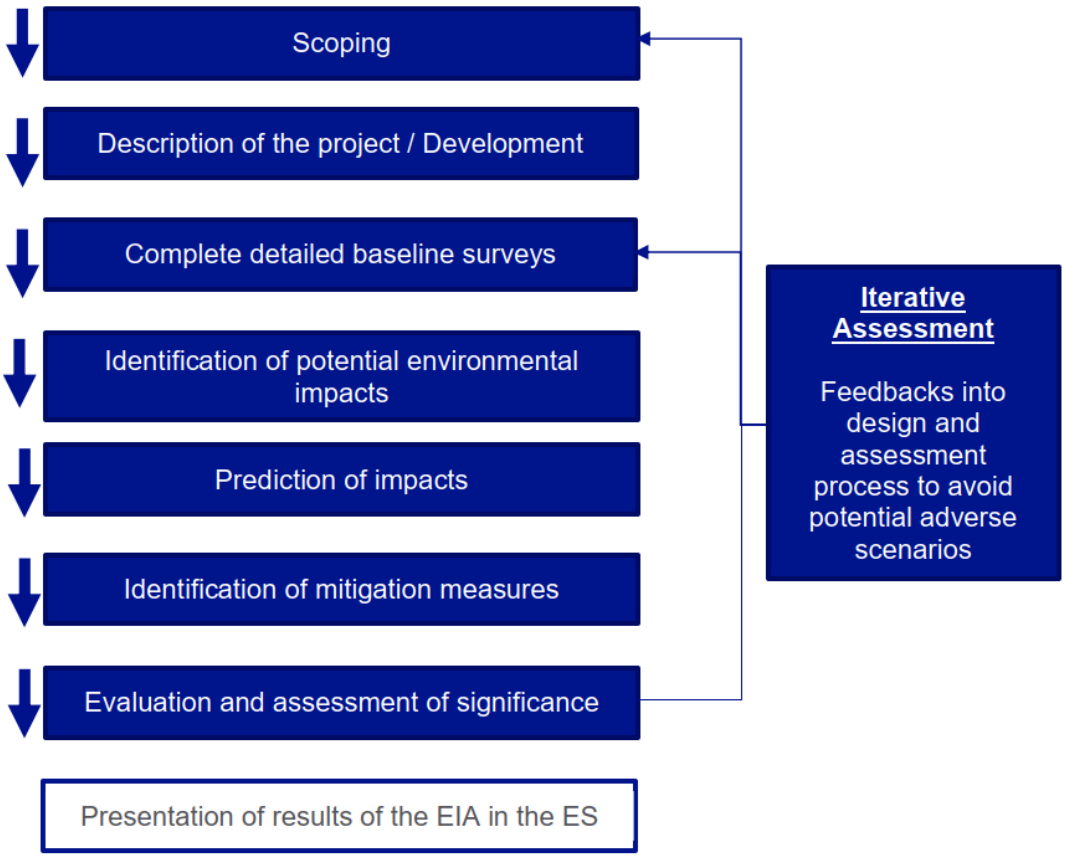
5.1.8 The preliminary assessments presented in this PEIR generally follow a receptor-based assessment approach (unless otherwise stated in each chapter). When deciding on which receptors to include within the PEIR, consideration was given to Regulation 5(2) and Schedule 4 paragraph 4 of the EIA Regulations (Ref 5.2).

5.2 The EIA Process

5.2.1 EIA is the process of compiling, evaluating and presenting information about the likely significant environmental effects, both adverse and beneficial, of a project. Environmental assessments are undertaken to help produce an environmentally sympathetic project and to provide decision makers and statutory consultees with the environmental information they require during determination of an application for consent. The early detection of likely significant adverse environmental effects enables appropriate mitigation (i.e., measures to avoid, reduce or offset likely significant adverse effects) to be identified and incorporated into the design of a project, or commitments to be made (for example implementing environmentally sensitive construction methods and working practices). The approach to mitigation is iterative and involves close working between National Grid, the EIA team and the Project designers.

5.2.2 Image 5.1 illustrates the main stages in the EIA process, and the iterative nature of assessment and project design.

Image 5.1 - EIA process



5.2.3 When applied to a Nationally Significant Infrastructure Project (NSIP), the EIA process is reported in the following documents:

- EIA Scoping Report: The EIA Scoping Report sets out the potential likely significant effects from a project (scope) based upon the information known about the project, and then identifies the form and nature of the assessments required to be undertaken to identify if the potential significant effects remain. It also presents the data collected and the proposed assessment methodology and approaches to be adopted in the EIA.
- PEIR (this is the current stage of the Project): The PEIR sets out the information that '*is reasonably required for the consultation bodies to develop an informed view of the likely significant environmental effects of the development*' (Ref 5.2). The PEIR is presented by an applicant to consultees to help inform their consultation responses during the Statutory Consultation[1] and is issued at the same time the Statutory Consultation launches. The PEIR represents a 'snapshot in time' of the ongoing environmental assessment process. It does not report the full results of the EIA, which will be presented in the ES that will be submitted with the DCO application. As such, the environmental information presented in the PEIR is based on assessment and survey data available at the time of writing the report.
- ES: The ES presents the results of the assessment carried out as part of the EIA process undertaken for a project. It identifies the likely significant effects that would result from a project if it was implemented, and the measures required to mitigate those significant effects. The ES is submitted as part of the application for development consent and is considered during the decision-making process.

5.3 Overview of the EIA Scoping Process

5.3.1 The process of scoping and the preparation of an EIA Scoping Report is a common approach for determining the EIA scope i.e., what environmental aspects will be considered, what methods of assessment will be used, and how conclusions will be reached regarding the significance of environmental effects.

5.3.2 An EIA Scoping Report (Ref 5.4) was prepared and submitted by National Grid to the Planning Inspectorate on 21 August 2023. The Planning Inspectorate provided a Scoping Opinion (Ref 5.1) on behalf of the Secretary of State (SoS) for the Department for Energy Security and Net Zero (DESNZ) on 29 September 2023.

5.3.3 The EIA Scoping Report (Ref 5.4) presented a Scoping Boundary which defined the area within which the infrastructure would be located, including the temporary and permanent construction and operational work areas.

5.3.4 The Scoping Opinion takes account of responses from prescribed consultation bodies[2], relevant statutory undertakers[3], Local Authorities[4], and non-prescribed consultation bodies as appropriate. These have subsequently informed the assessment work and further design evolution undertaken to date. Responses from National Grid to the

[1] Statutory consultation under Section 42 of the Planning Act 2008 (as amended) ('the Act')

[2] Schedule 1 of The Infrastructure Planning (Applications: Prescribed Forms and Procedure) regulations 2009 (the 'APFP Regulations')

[3] 'Statutory Undertaker' is defined in the APFP Regulations as having the same meaning as in Section 127 of the Planning Act 2008

[4] As defined in Section 43(3) of the Planning Act 2008

Scoping Opinion (Ref 5.1) comments, detailing how they have either been addressed within this PEIR or will be addressed within the ES, are provided in each technical chapter. Given the preliminary nature of the information presented in this PEIR, any comments that are pending a full response are identified, with next steps clarified, and any actions to be concluded within the ES set out.

5.3.5 The Scoping Report (Ref 5.4) and Scoping Opinion (Ref 5.1) reflect the information available at the time they were prepared. The results of further baseline investigations may require modifications to be made to aspects of the EIA scope, for example the need to undertake further additional surveys beyond those proposed in the EIA Scoping Report (Ref 5.4) and/or identified in the Scoping Opinion (Ref 5.1). Similarly, any changes to the Project resulting from further technical or environmental investigations, or through changes brought about in responses to consultation, may influence the scope of the EIA. Any incidences where the EIA scope has altered since publication of the Scoping Opinion (Ref 5.1) are identified in each of the technical chapters (**Chapters 6 to 21**).

5.3.6 As set out in **Chapter 4 Description of the Project**, following publication of the EIA Scoping Report (Ref 5.4) the approach to the inclusion of the proposed Birkhill Wood Substation and proposed High Marnham Substation (to which the overhead line is proposed to connect) has altered. Whilst implementation of these two substations remains subject to achieving consent through separate applications made under the Town and Country Planning Act 1990 (TCPA) procedures, in order to achieve a comprehensive consenting position for the Project these substations have been included as part of the Project. The preliminary assessment of the likely environmental effects of these substations is provided **Chapter 20 Substations and Associated Works**.

5.3.7 A summary of the Scoping Opinion (Ref 5.1) together with a response from National Grid against each point of relevance to overarching comments on the EIA methodology and assessment scope are provided in Table 5.1.

Table 5.1 - Scoping Opinion responses EIA methodology and assessment scope

ID	Inspectorate's comments	Response
2.2.1	**Description of alternatives**: The Scoping Report describes the approach taken so far to develop the route corridor and how environmental matters have been taken into account in the refinement of the scoping boundary. The Inspectorate notes the proximity to local settlements and that designated sites remain within the scoping boundary. The Inspectorate also directs the Applicant to the Environment Agency's consultation response (Appendix 2 of this Opinion) in relation to the presence of land in Flood Zones 2 and 3, and the Canal and River Trust's response in relation to navigable waterways (namely Chesterfield Canal	The scoping boundary has now been refined to form the draft Order Limits, to be consulted on as part of this statutory consultation. This refinement has taken account of the feedback received through both rounds of non-statutory consultation, the Scoping Opinion (Ref 5.1) and further environmental, socio-economic and technical work. Details of how the Project has been refined in response to feedback received is described in **Chapter 3 Project Need and Alternatives** and the **Design Development Report**.

ID	Inspectorate's comments	Response
	and Stainforth & Keadby Canal) within the scoping boundary. The ES should describe how the presence of these, and other environmental constraints, has continued to inform subsequent design choices, such as siting of particular elements of the infrastructure or the use of particular construction technologies. With reference to the iterative design process in Image 5.1 of the Scoping Report, the ES should demonstrate how these choices have been influenced by environmental factors.	The embedded mitigation relevant to each discipline is set out in section 6 of each of the technical chapters (**Chapters 6 -19**).
2.2.2.	**Biodiversity Net Gain (BNG):** The Inspectorate notes that the Applicant is committing to provide 10% BNG as part of the Proposed Development. Clarity should be provided to distinguish any measures described in the ES which are provided as mitigation, as compensation, or developed as part of the commitment to BNG. The Applicant should ensure that these measures are appropriately secured in the dDCO and described within the ES	A BNG report will be provided within the DCO application. The ES will distinguish between mitigation, compensation and BNG. National Grids proposed approach to BNG and other environmental enhancements is set out in the **Project Background Document** and **Design Development Report**. How mitigation, enhancements and BNG will be appropriately secured within the DCO will be described within the ES.
2.2.3	**Choice of route corridor option technology:** The Inspectorate notes the Applicant's proposal to place the new line parallel to the existing 400kV line, on the basis it is considered to concentrate the impact in one place rather than creating new impacts elsewhere. The ES should expand on the reasons for the choice of route and method for installation, taking into account environmental considerations.	The reasons for the selection of the preferred corridor and draft Order Limits, including where close parallel sections have been included, are set out in **Chapter 3 Project Need and Alternatives** and the **Design Development Report**. **Chapter 4 Description of the Project** describes how the Project will be installed.
2.2.4	**Decommissioning:** The Applicant identifies that the new overhead line would have a lifespan of 80 years and that decommissioning is not therefore scoped into the assessment. The Inspectorate notes that there is potential for the Proposed Development to involve the removal or replacement of pylons from an existing 400kV overhead line as part of the 'line swap over' process. Where swap overs are needed	A description of dismantling is provided in **Chapter 4 Description of the Project**. Where dismantling of existing pylons is proposed as part of the Project, this has been assessed within the preliminary assessments reported within each topic chapter (**Chapters 6 – 19**).

ID	Inspectorate's comments	Response
	the ES should consider the effects of decommissioning existing pylons and those sections of the line where the swap overs occur.	
2.2.5	**Value of receptor:** The proposed approach to the value of receptors in Table 5.2 refers to defining the value of receptors based on international importance, with no reference to receptors of national, regional, or local importance. The proposed approach to setting the geographical value of receptors should also take account of and define sites or features of national, regional, or local importance. The ES should ensure that the criteria used for the assessment are defined such that it is easy to follow the methodology used.	The term 'international' presented in the high, medium, small and negligible sensitivity criteria in Table 5.2 in the EIA Scoping Report (Ref 5.4) was included by error. Table 5.3 below has been amended to reflect the correct definition.
2.2.6	**Judgements on significance of effects:** Where professional judgement is used to determine whether an identified effect is significant or not significant in the ES, this decision should be supported by clear reasons and evidence and make reference to any relevant guidance**.**	The ES will provide reasons to support the conclusion of significance, making reference to relevant guidance where appropriate.
2.2.7	**Major effects:** The proposed approach to the 'major' sensitivity criterion refers to sites and features of national importance. The Inspectorate considers that the 'major' sensitivity criterion should also consider effects on sites or features of international importance.	Table 5.4 below has been updated to include international importance.
2.2.8	**Cumulative Effects Assessment (CEA) – consultation:** The Applicant should seek to agree the size of study area and the list of plans or projects for inclusion within the CEA with the relevant local authorities, taking into account the zones of influence for different aspect assessments.	A preliminary CEA is presented in **Chapter 21 Cumulative Effects**. This takes account of the zones of influence (ZOI) (i.e., study areas) of each of the different aspect chapters. Where study areas have been agreed with the relevant stakeholders for each aspect, this is set out within each of the topic chapters (**Chapter 6 – 19**). Engagement will continue throughout the production of the ES and the Project will seek to agree the size of the CEA study area and short list of

ID	Inspectorate's comments	Response
		plans and projects assessed with the Local Planning Authorities.
2.2.9	**CEA – short list of projects:** The ES should include an appropriate figure clearly depicting the locations and extent of projects included in the CEA in relation to the location of the Proposed Development. This should include consideration of those projects that cover a wide geographical area extending beyond the proposed study area or provide justification for why cumulative effects are unlikely to occur. This should include other major renewable energy projects in Lincolnshire and Nottinghamshire. The short list should also reflect the development pressures affecting the Humber Estuary, in particular the potential for effects on land functionally linked to protected sites along the Humber	A preliminary CEA assessment is provided in **Chapter 21 Cumulative Effects**. This includes **Figure 21.2 Cumulative Short List of Other Developments** in Volume 2 which illustrates the location of the other developments that have been taken into account in the preliminary assessment and how the ZOI used to derive the long list of developments considered has been established. The short list includes projects where there is a potential for a cumulative effect on land functionally linked to the Humber Estuary.
2.2.10	**Compliance with Code of Construction Practice (CoCP):** The Inspectorate notes National Grid will use procedures to audit and inspect compliance with measures within the CoCP. The ES should set out how this will be achieved and secured and describe the process of monitoring and reporting any identified non-compliances. Where non-compliances are identified, the ES outline CoCP should also demonstrate what remedial actions will be taken.	The ES will set out how these measures, monitoring and remedial actions will be secured. A draft Outline CoCP has been provided at **Appendix 4.1 Draft Outline Code of Construction Practice (CoCP)** in Volume 3.
2.2.11	General points on CoCP: The Inspectorate makes the following comments on the measures within the outline CoCP to individual measures referenced in Appendix 4A: • The relationship between the EIA, CoCP, Construction Environmental Management Plan, Landscape and Ecological Management Plan, Site Waste Management Plan and Construction Traffic Management Plan should be set out, using	A Draft Outline CoCP is provided at **Appendix 4.1** this will be developed based on the outputs of the EIA and engagement with stakeholders and consultees and a CoCP provided as part of the DCO submission. The following responses provide a response to comments which have been addressed in **Appendix 4.1 Draft Outline Code of Construction Practice**, all comments will be responded to within the ES.

ID	Inspectorate's comments	Response
	appropriate figures or diagrams for ease of understanding of the scope and purpose of the documents; • the responsibilities of each identified role within the CoCP should also be set out, using appropriate diagrams or figures to allow for ease of understanding of the management hierarchy; • how liaison with local authorities and other relevant consultation bodies will be incorporated into the CoCP; • where more than one contractor is responsible for construction works, how the Applicant will ensure consistency of CoCP measures across multiple construction contractors and / or work sites; • how the standard of reinstatement will, as a minimum, meet the recorded pre-construction condition; • the steps to be taken to reduce the potential for measures to be employed that are outside of the terms of the CoCP; • the frequency of liaison with the local community and how this will be achieved and managed, with reference to the CoCP roles and responsibilities; • how the Applicant will measure and control the quality of reinstatement measures and what remedial measures will be used where pre-construction conditions are unlikely to be met; • where vegetation is to be removed, this should be within the parameters of the assessment presented within the EIA; • 'high grade trees' should be defined, with reference to the ecology and biodiversity assessment, arboricultural strategy methodology	Section 1.6 of the **Appendix 4.1 Dratf Outline Code of Construction Practice** lists the management plans which are currently proposed to be submitted with the DCO application. This will be confirmed within the CoCP submitted with the DCO application and a diagram will be provided where appropriate. The illustrative key roles and responsibilities are set out in section 1.1 of **Appendix 4.1 Draft Outline Code of Construction Practice**, this will be reviewed and updated where appropriate within the CoCP to be submitted with the DCO application. Section 1.4 of **Appendix 4.1 Draft Outline Code of Construction Practice** sets out how the Project will undertake community engagement and provide public information during the construction of the Project. This will be reviewed and updated where appropriate within the CoCP to be submitted with the DCO application. Section 4.5 of **Chapter 4 Description of the Project** describes the phasing and indicative duration of construction. The individual topic chapters have assessed the impact of temporary construction activities (where these are scoped into their assessments).

ID	Inspectorate's comments	Response
	(Appendix 8.C) and subsequent arboricultural assessment; • any replacement roost or structures such as hibernacula for reptiles should be installed and available in advance of any removal of any existing roost or resting place structures and in line with relevant guidance; and • the duration of 'temporary' activities should be defined.	
2.2.12	**CoCP – use of Horizontal Directional Drilling (HDD):** The CoCP should include consideration of the potential for HDD to be used during construction. This should include the measures to avoid potential pollution, a requirement for risk assessment for the use of drilling muds and details of liaison and permitting requirements with the Environment Agency.	As a result of ongoing assessment and appraisal, no sections of undergrounding on the proposed overhead line are proposed. There is the requirement to divert existing utilities including low voltage wood pole and telecommunication overhead lines. This includes undergrounding of these assets and may include the use of HDD to cross features such and roads and watercourses. How the CoCP will be applied to works undertaken by third parties will be set out in the ES.
2.2.13	**Linear assessments**: The Inspectorate considers that given the linear nature and distance of the Proposed Development, that the assessment should be clear on where effects are considered to be project-wide, or where effects are associated with particular sections of the route.	The topic chapters within this PEIR are presented either holistically (project wide) or by Route Section. This is dependant on the type of receptor.
2.2.14	**Transboundary:** The Scoping Report states that the transboundary matrix is presented in Appendix 1A, however this Appendix has not been provided. The Inspectorate notes that it has an ongoing duty in relation to consideration of transboundary effects and will undertake a separate transboundary screening exercise on behalf of the SoS under Regulation 32 of the EIA Regulations following adoption of the Scoping Opinion. The Inspectorate recommends that where Regulation 32	Transboundary screening was undertaken by the Planning Inspectorate (Ref 5.8) on behalf of the SoS. This concluded the Project is not likely to have a significant effect on the environment in a European Economic Area (EEA) State, and therefore no further action is required at this stage.

ID	Inspectorate's comments	Response
	applies, the ES should identify whether the Proposed Development has the potential for significant transboundary effects and if so, what these are and which European Economic Area (EEA) States would be affected. Note: The SoS' duty under Regulation 32 of the 2017 EIA Regulations continues throughout the application process. The Inspectorate's screening of transboundary issues is based on the relevant considerations specified in the Annex to its Advice Note Twelve, available on our website at http://infrastructure.planninginspectorate.gov.uk/legislation-andadvice/advice-notes/	
2.2.15	**Receptors:** For the avoidance of doubt, when considering disruption to receptors using PRoW, this should include consideration of users of the Yorkshire Wolds Way National Trail, other national trails within the study area and, where relevant, the England Coast Path and coastal access routes.	These routes have been taken into account within the preliminary assessments presented in this PEIR.

5.4 Overview of the Post-Scoping EIA Process

5.4.1 This section describes the methodology which is being used to assess the potential effects on the natural, human and built environment as a result of the Project. In accordance with the EIA Regulations (Ref 5.2), the assessments undertaken will identify and evaluate the likely significant environmental effects arising from the proposed construction, operation and maintenance phases of the Project.

5.4.2 The primary objective of the EIA is to identify likely 'significant' effects, since it is these effects that must be reported in the ES. This is undertaken by first predicting impacts and then evaluating their severity against agreed significance criteria.

5.4.3 The prediction, quantification and evaluation of an impact and the significance of resulting effects is typically undertaken by considering the relationship between two factors:

- The magnitude of an impact (that is, the actual change taking place to the environment); and
- The value of the affected baseline resource or receptor and its sensitivity to the impact.

Technical Scope

5.4.4 The technical scope of the assessment for each environmental aspect is detailed in the topic chapters (**Chapter 6 to 21)**. The technical scope also details the approach to baseline data collection and assessment methodologies.

Spatial Scope

5.4.5 The spatial scope for each environmental aspect i.e., 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 effects and the location of receptors that could be affected. It takes account of:

- the area of land required to construct, operate and maintain the Project;
- the nature of the baseline environment; and
- the manner and extent to which environmental effects may occur.

5.4.6 The draft Order Limits which are illustrated on **Figure 4.1 Proposed Project Design** in Volume 2 encompass the land National Grid currently considers to be required permanently and temporarily to construct, operate and maintain the Project. The draft Order Limits[5] comprise the working width to construct the Project, including the construction compounds, road access points, the land required for permanent above and below ground features, and rights of access, both temporary during construction and permanent for maintenance.

5.4.7 In addition to the draft Order Limits, Limits of Deviation (LoD) have been provided. LoD represent the dimensions within which the final alignment of the overhead line and associated features could be installed. The preliminary assessments within this PEIR and the final assessments to be reported in the ES will assume that the alignment could lie anywhere within the LoD and take a reasonable worst-case approach when undertaking the assessment. This allows for minor deviations without triggering the need to revise the assessment, which is in line with accepted approaches to an ES and Planning Inspectorate's Advice Note Nine (Ref 5.5).

5.4.8 The study areas used for the preliminary assessments in this PEIR and within the ES is, and will be, based on the distance over which an impact is likely to occur. Study areas are defined in each of the topic chapters within this PEIR and vary between topics. Study areas may also vary in topic chapters between the construction, operation and maintenance phases and identified receptors. For example: physical impacts on soil resources during construction may be confined to the construction footprint, whereas impacts on water quality may extend further downstream beyond the construction footprint. The spatial scope of each assessment may be refined within the ES in response to comments from consultation or further assessment work.

[5] The draft Order Limits comprise a refined version of the scoping boundary presented at scoping. The draft Order Limits have been defined following further information gathering, assessment and design-development being undertaken.

Temporal Scope

5.4.9 Subject to gaining development consent, construction would be expected to start in 2028 and would be completed by 2033[6] inclusive of reinstatement.

5.4.10 This PEIR (and ultimately the ES) will predict the changes (impacts) to the current and future baseline during the construction and operation phases of the Project. The general approach is summarised below and any variations from this are identified and discussed in the relevant technical chapters:

- Baseline year: the baseline is the reference level of the environmental conditions without implementation of the Project, against which the potential effects of the project are assessed. The baseline year is 2024, when the majority of baseline surveys have taken place. For certain topics the baseline environment is expected to change between the baseline year and the start of the construction of the Project (expected to be 2028), and for these topics this change has been predicted to enable robust identification of the effects of the project against a future baseline.
- Construction Phase: these are effects that are likely to occur during the construction phase of the Project. This will include effects resulting from the activities associated with the construction of the proposed Birkhill Wood Substation close to the existing Creyke Back Substation and the proposed High Marnham Substation adjacent to the existing High Marnham Substation, and the installation of the overhead line and works to facilitate the connection of the overhead line into these proposed substations. It also includes effects associated with the temporary works such as access tracks, haul roads, construction compound areas and work activities.
- Operation Phase: these are effects that will potentially occur as a result of the presence, operation and maintenance of the Project.

5.4.11 The environmental assessment uses defined temporal scales to characterise the duration of potential effects. For the purposes of the preliminary assessment, the following definitions are applied unless otherwise defined in the specific topic chapter:

- Permanent – these are effects that will 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 will cease when that activity finishes.

5.4.12 The temporal nature of effects could be different to the phase in which the effects occur. For example, effects as a result of vegetation clearance during construction may be experienced for a number of years after construction has been completed, before any replacement planting has established and matured. Within this PEIR, the effects are described under the phase within which the impact arises (i.e., in the above example, vegetation loss is assessed for the construction phase).

5.4.13 The future baseline is the theoretical situation that would exist in the absence of the Project. This is based upon extrapolating the current baseline using technical knowledge of likely changes to predict this (e.g., predictable changes such as climate change, changes that can be predicted based on reasonable assumptions and modelling calculations, information about other relevant developments etc.).

[6] Note: Although these are expected construction dates, the DCO may authorise a time limit for commencement of development up to five years after receiving consent.

5.4.14 Each technical chapter of the ES will define the baseline (current or future or both) against which the environmental effects of the Project will be assessed. The baseline conditions to be assessed for each environmental topic are outlined in the technical chapters (**Chapter 6 to 21**) of this PEIR. Where relevant, topic chapters provide further information on the time elements within the Project programme that will be considered for their assessment.

Assessment of Effects and Determination of Significance

5.4.15 The prediction of potential effects has been undertaken to determine what could happen to each environmental receptor because of the Project and its associated activities. A range of potential impacts have been considered within the assessment process using a range of prediction methods including quantitative, semi-qualitative and qualitative as appropriate.

Identification of potential effects

5.4.16 The likely significant effects (beneficial and adverse) of the Project have been predicted and evaluated using appropriate evaluative techniques, many of which follow topic-specific best practice guidelines. Potential effects have been identified first, in summary, as an indication of what effects could theoretically occur in the absence of mitigation (other than mitigation inherent in the design of the Project i.e., embedded mitigation and control and management measures, as detailed below).

Approach to mitigation

5.4.17 A number of measures would be adopted in the Project to avoid and reduce the likely significant effects that would be experienced during implementation of the Project. These fall into one of three categories: embedded measures, control and management measures, and additional mitigation measures.

5.4.18 Embedded mitigation measures are those that are intrinsic to and built into the design. Embedded measures may include, for example, working within the existing topography to reduce pylon intrusion, and reducing habitat loss by minimising land take. They can also include the avoidance of designated sites through sensitive routeing, siting and design. Embedded measures are described within **Chapter 4 Description of the Project**.

5.4.19 Control and management measures comprise management activities, control measures and techniques that would be implemented during construction of the Project to limit impacts. They include adherence to good site practices and achieving legal compliance. These measures may include, for example, applying construction site dust suppression techniques within working areas, which the Main Works Contractor would be required to implement as part of their working practices under the terms of their contract. Control and management measures to address construction-related impacts are described in each of the technical chapters and are detailed **Appendix 4.1 Outline Code of Construction Practice**. As the Project evolves these will be added to as appropriate and will be supplemented by other control and management documents such as the Construction Traffic Management Plan (CTMP).

5.4.20 In addition, licenses through separate regimes may also be required. For example, ecological licences and assents granted by Natural England and various permits relating to water and waste granted by the Environment Agency. On the presumption that the regulatory authorities would not permit the works unless the potential impacts

have been appropriately managed, it is assumed that these licensable activities are considered measures adopted as part of the Project.

5.4.21 Additional mitigation measures comprise measures over and above any embedded and control and management measures, for which the EIA has identified a requirement to further reduce significant environmental effects (such as offsite planting).

5.4.22 As consent for the Project will be sought through a DCO, all three categories of mitigation will be the subject of a DCO requirement to secure their delivery and make their implementation a legal requirement. In addition, as most potential effects will be mitigated through a combination of embedded measures and control and management measures, no assessment of likely significant effects has been undertaken prior to the application of the third category 'additional mitigation measures' as this would result in significant repetition within the document.

Assessment of Effects and Determination of Residual Significance

5.4.1 There is no statutory definition of what constitutes a 'significant' effect within the EIA Regulations (Ref 5.3). The process typically involves consideration of two aspects of a potential effect, namely the sensitivity and/or value of the receptor or resource, and the magnitude of the impact on the receptor/resource.

5.4.2 These two aspects will give due regard to the significance criteria for each technical discipline. These are:

- scale of the impact;
- impact duration, and whether effects are temporary, revisable, or permanent;
- effect nature (whether direct or indirect, reversible or irreversible, beneficial or adverse);
- where the effect occurs in isolation, is cumulative, or will interact with other effects;
- performance against any relevant environmental quality standards;
- sensitivity of the receptor; and
- compatibility with environmental policies.

5.4.3 The significance of the residual effects (those that are predicted to remain after all the environmental mitigation measures have been implemented) will be determined by reference to criteria for each assessment topic as detailed above, notwithstanding those effects that are considered to be temporary and or irreversible.

5.4.4 Each technical chapter of this PEIR includes a description of the proposed approach to determining the significance of effects, including how professional judgement may be applied. The technical chapters use the terminology for magnitude, sensitivity and significance described in the following sections unless there is a need to deviate due to topic-specific guidance. Where there is a requirement to deviate, justification is provided within the technical chapter.

Magnitude of impact

5.4.5 General criteria for defining the magnitude of an impact, or change, are set out in Table 5.2. Key factors that influence this include:

- scale of change – the scale of change refers to the degree of change to or from the baseline environment caused by the impact being described;
- spatial extent – the extent of an impact is the full area over which the impact occurs; and
- duration and frequency – the duration is a measure of how long the impact is expected to last. Frequency refers to how often the impact would occur; it may be continuous or periodic.

Table 5.2 - Impact magnitude criteria

Magnitude	General criteria
Large	Adverse: Loss/alteration of resource and/or quality and integrity of resource; severe damage to key characteristics, features, or elements. Beneficial: Large scale or major improvement of resource quality; extensive restoration; major improvement of attribute quality.
Medium	Adverse: Loss/alteration of resource, but not adversely affecting the integrity; partial loss of/damage to key characteristics, features or elements. Beneficial: Benefit to, or addition of key characteristics, features or elements; improvements of attribute quality.
Small	Adverse: Some measurable alteration in attributes, quality or vulnerability; minor loss of, or alteration to, one (maybe more) key characteristics, features or elements. Beneficial: Minor benefit to, or in addition of, one (maybe more) key characteristics, features or elements; some beneficial impact on attribute or a reduced risk or negative impact occurring.
Negligible	Adverse: Very minor loss or detrimental alteration to one or more characteristics, features or elements. Beneficial: Very minor benefit to or positive addition of one or more characteristics, features or elements.

Sensitivity and value of the receptor

5.4.6 The sensitivity of a receptor or resource is characterised by its vulnerability to change and its ability to recover. The value of a receptor or feature reflects its overall importance, and the value placed on it by society; this may be reflected by its level of statutory or policy protection or else a value may be attributed through consultation and the application of professional judgement. Criteria for defining the sensitivity and/or value of a receptor are set out in Table 5.3. Characterisation of the receptor is achieved by balancing out these considerations to determine the receptor's sensitivity:

- vulnerability – the vulnerability of the receptor relates to its capacity to accommodate change i.e., the tolerance/intolerance of the receptor to change;
- recoverability – the ability of the receptor to return to the baseline state; and
- importance – the importance of the receptor is a measure of the value assigned to that receptor based on biodiversity and ecosystem services, social value and economic value. Importance of the receptor is also defined within a geographical context, whether it is important internationally, nationally or locally.

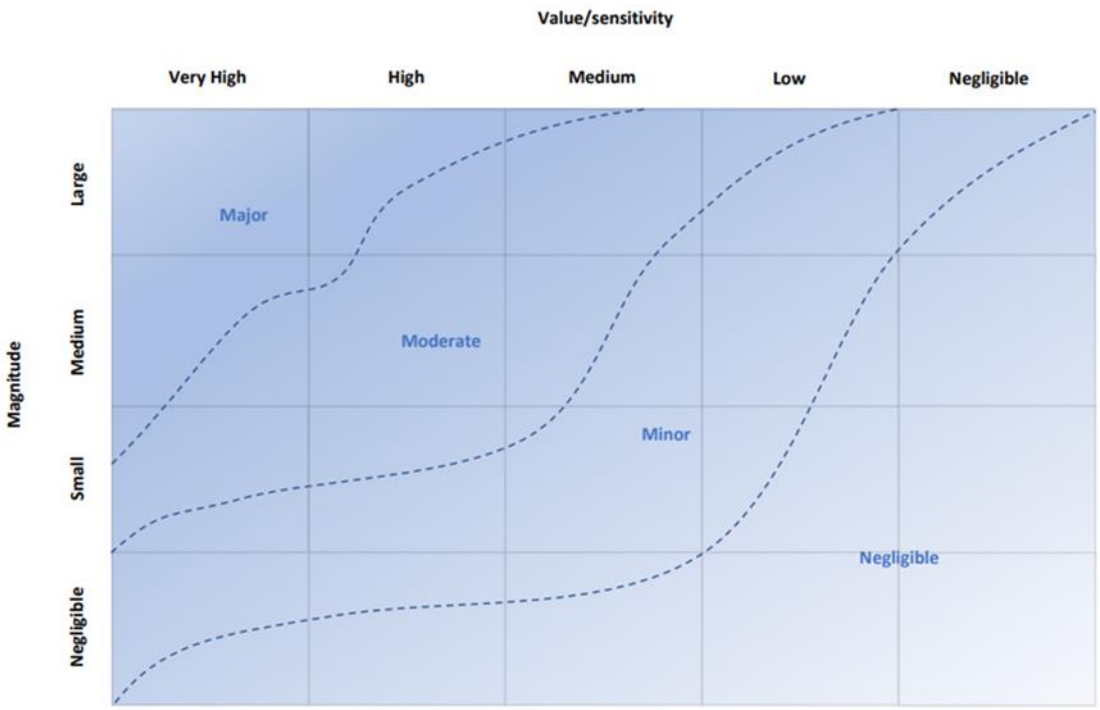
Table 5.3 - Value/sensitivity criteria

Value/sensitivity	General criteria
Very High	Of value, importance, or rarity on an international scale and with very limited potential for substitution; very sensitive to change or has very little capacity to accommodate change.
High	Of value, importance, or rarity on a national scale and with limited potential for substitution; and/or sensitive to change or has little capacity to accommodate change.
Medium	Of value, importance, or rarity on a regional scale and with limited potential for substitution; and/or moderately sensitive to change, or moderate capacity to accommodate change.
Low	Of value or importance on a local scale; not particularly sensitive to change or has considerable capacity to accommodate change.
Negligible	Very low importance and rarity, valued at a local level, easy to replace.

Evaluating the significance of effects

5.4.7 Having established the magnitude of impact and sensitivity of the receptor, the significance of an effect can be assessed. To aid transparency in the assessment process, the matrix shown on Image 5.2 will be used as the basis for assigning significance to an effect; however, the identification of significance typically requires the application of professional judgement. As an illustration, a high sensitivity receptor subject to a large magnitude of impact would experience a major or moderate significance effect, and a low sensitivity receptor subject to a small magnitude of change would experience a minor or negligible significance effect.

Image 5.2 - Basis of assigning significance



5.4.8 Each of the specialist disciplines will apply magnitude and sensitivity criteria that best suit the topic area, and for some topics these may be defined in industry guidelines.

5.4.9 Following the classification of an effect using the methodology, a clear statement will then be made in the ES as to whether that effect is significant or not significant. Major and moderate effects are typically considered to be significant, whilst minor and negligible effects are considered to be not significant. However, professional judgement will also be applied in reaching conclusions as to the significance of effects. Generic definitions for the classification of effects are shown in Table 5.4.

Table 5.4 - Generic significance description

Significance	General criteria	Significant effect
Major	A large and detrimental change to a valuable/sensitive receptor; likely exceeding an accepted (often legal) threshold. A large and beneficial change, resulting in improvements to the baseline result in previously poor compliance or a major contribution being made to national targets. These effects may represent key factors in the decision-making process. Potentially associated with sites and features of international and national importance or likely to be important considerations at	**Yes**

Significance	General criteria	Significant effect
	a regional or district scale. Major effects may relate to resources or features that are unique and which, if lost, cannot be replaced, or relocated.	
Moderate	A medium scale change that, although not beyond an accepted threshold, is still considered to be generally unacceptable, unless balanced out by other significant positive benefits of a project. Likely to be in breach of planning policy, rather than legal statute. These effects, if adverse, are likely to be important at a regional or local scale and on their own could have a material influence on decision making. A positive moderate effect is a medium scale change that is significant in that the baseline conditions are improved to the extent that guideline targets (e.g., UK Biodiversity Action Plan (BAP) targets) are contributed to.	**Yes (typically)**
Minor	A small change that, whilst adverse, does not exceed legal or planning policy thresholds. A small positive change, but not one that is likely to be a key factor in the overall balance of issues. These effects may be raised as local issues and may be of relevance in the detailed design of a project but are unlikely to be critical in the decision-making process.	No
Negligible	A very small change that is so small and unimportant that it is considered acceptable to disregard. Effects which are beneath levels of perception, within normal bounds of variation or within the margin of forecasting error, these effects are unlikely to influence decision making, irrespective of other effects.	No

Defining Residual Significance in the PEIR

5.4.10 At this preliminary stage the surveys and assessment work have progressed to differing degrees for different technical assessments, and mitigation measures have not all been fully defined or designed.

5.4.11 However, for all technical topics enough information has been gathered and assessed to enable identification of whether significant effects are likely or unlikely to occur. Within the PEIR, the information is not sufficient to allow a more precise or quantitative prediction of the level of significance to be made; therefore, the approach taken has been to only state whether effects are likely to be significant or not, rather than assigning significance levels.

5.4.12 In general, a cautionary approach is taken to ensure that where uncertainty currently exists with any assessment work, a worst-case consideration has been made to the

identification of a particular effect's significance. The generic significance of effect descriptions applied to the preliminary assessments within this PEIR are set out in Table 5.5.

Table 5.5 - Generic significance descriptions in the PEIR

Significance	Indicative description
Significant	Large adverse changes that will exceed accepted (often legal) thresholds, to a medium scale change which may exceed accepted thresholds or lead to a breach of planning policy. Large beneficial changes, leading to improvements to the baseline resulting in previously poor conditions being replaced by new legal compliance or major contribution being made to national targets, ranging to a medium scale change that is significant in that the baseline conditions are improved to the extent that guideline targets are contributed to. Consideration should be given to the type and sensitivity of affected receptors and the scale of the impact and its resulting effect.
Not Significant	A small change that, whilst adverse, does not exceed legal or guideline standards and is unlikely to breach planning policy, ranging to a very small scope change that is so small and unimportant that it is considered acceptable to disregard. A small positive change, but not one that is likely to be a key factor in the overall balance of issues. Consideration should be given to the type and sensitivity of affected receptors and the scale of the impact and its resulting effect.

5.4.13 The preliminary assessment presented in each of the technical chapters (**Chapter 6 to 19**) states whether effects are likely to be positive or negative, together with predicting if effects are likely to be significant or not significant. All conclusions and assessments are by their nature preliminary.

Confidence in prediction of the significance of effects

5.4.14 Following on from the identification of whether an effect is considered to be significant or non-significant, the confidence in the prediction of the significance of effects is given a rating of high, moderate or low and a justification provided. Definitions of high, moderate and low confidence levels are provided in Table 5.6.

Table 5.6 - Confidence level definitions

Confidence Level	Definition
High Confidence	A high level of confidence in the prediction of significance effects could be justified through: • The consideration of, and routeing and/or siting of the Project away from, designated features and high sensitivity receptors; • Complete baseline data to inform the prediction; • The application of mitigation measures has proven to be effective in similar projects; and • A thorough understanding of Project activities.
Moderate Confidence	A moderate level of confidence in the prediction of significance effects could be justified through: • Particular surveys or assessments are incomplete at this stage, but it is possible to extrapolate results; • Mitigation measures will continue to be developed up to the submission of the application for consent; and • A general understanding of the Project activities being undertaken, and the associated impacts based on other Projects, while more detailed information will be provided later.
Low Confidence	A low level of confidence in the prediction of significance effects could be justified through: • Only extremely limited baseline data is available at this stage; • Input assessments are unavailable or limited to the extent isn't possible to confidently identify the effect and its significance. • Exact project activities are unknown; and • Where this is the case, a precautionary, worst-case approach is taken.

5.5 Design Envelope

5.5.1 Major infrastructure projects such as linear infrastructure projects for overhead lines and above ground installations, such as substations, typically need some flexibility to be maintained for detailed design and construction, if conditions are found that would otherwise prevent or delay construction. Examples can include previously unknown

archaeological assets or poor ground conditions at pylon locations. To mitigate such issues a flexible approach to design parameters is used within the EIA process, and this is typically referred to as the 'Rochdale Envelope' as it allows for a realistic worst-case assessment to be undertaken. The Planning Inspectorate's Advice Note Nine (Ref 5.5) outlines the approach that can be taken, in accordance with the requirements of the EIA Regulations (Ref 5.2), where some details of the Project have not yet been confirmed when the Application is submitted and where flexibility is sought to address this uncertainty.

5.5.2 By developing a realistic worst-case scenario in response to critical technical and engineering parameters, as well as the emerging findings of the EIA and feedback from stakeholders, it is possible to strike a balance between the level of design information needed for the purpose of EIA and the application for consent, while still retaining the level of design flexibility needed as the Project moves into detailed design and construction.

5.5.3 The EIA process will aid and inform the design process and support the identification of a design freeze that is flexible enough to accommodate change in future stages but not so flexible that it could overstate or unnecessarily amplify the potential environmental impacts of the Project.

5.5.4 Assessing using a parameter-based design envelope approach means that the assessments will consider a scenario which represents the worst-case for each aspect, whilst allowing the flexibility to make improvements in the future in ways that cannot be predicted at the time of submission of the DCO application. Development permitted by the DCO will not extend beyond the clearly defined parameters assessed in the ES. For example, defined LoDs are assumed to provide the flexibility to relocate a pylon due to poor ground conditions.

5.5.5 At this stage only preliminary environmental information is being provided, as the design of the Project and the Order Limits to be applied for have not been finalised. However, the principles and assumptions that are currently envisaged to be applied in respect of the LoD, as set out above, have been taken into account to ensure that the assessment is robust and considers a realistic worst case for the final built Project.

5.5.6 The preliminary assessment of likely significant effects reported in this PEIR is based on the description of the design, construction, operation (and maintenance) of the Project and includes the flexibility as presented in **Chapter 4 Description of the Project**. For most topics the assessment reflects the worst-case scenario of the flexibility afforded i.e., construction taking place up the edge of the draft Order Limits. For some topics, however, they require an assessment of the indicative location of infrastructure within the draft Order Limits and LoDs. Where this is the case, commentary is provided to confirm that utilising the flexibility afforded will not increase the significance of effect that is predicted.

5.6 Assessment of the Proposed Substation Works

5.6.1 Following publication of the EIA Scoping Report (Ref 5.4) the approach to the inclusion of the proposed Birkhill Wood Substation and proposed High Marnham Substation (to which the overhead line is proposed to connect) has altered. Whilst implementation of these two substations remains subject to achieving consent through separate applications made under the TCPA procedures, in order to achieve a comprehensive consenting position for the Project these substations and their associated overhead line reconfigurations have been included as part of the Project. The preliminary assessment

of the likely environmental effects of the Proposed Substation Works is provided in **Chapter 20 Substations and Associated Works**.

5.6.2 To ensure that the Project as a whole has been assessed a summary paragraph has been included within the preliminary assessment section in each of the topic chapters (**Chapter 6 -19**) which brings together the assessment of the Proposed Overhead Line and Proposed Substation Works for each topic.

5.6.3 This approach will be reviewed and refined for the production of the ES, should one or both proposed substations still form part of the Project.

5.7 Cumulative Effects Assessment (CEA)

5.7.1 When undertaking an assessment of the environmental effects of a project, it is necessary to consider how various effects may interact, and also how the effects of the project could accumulate with the effects of other developments proposed within the same zone of influence. The cumulative effects assessment for the Project will include the following effects:

- inter-project effects: effects resulting from the Project combined with the same aspect-related effects generated by other developments to affect a common receptor; and
- intra-project effects: individual environmental aspect effects resulting from the Project, which are not significant in their own right, but could combine with other environmental aspect effects from the Project to create effects that are significant.

5.7.2 The methodology for both the intra-project and inter-project cumulative assessments is provided in **Chapter 21 Cumulative Effects** along with a preliminary assessment of inter-project cumulative effects. As the PEIR is presenting a preliminary assessment and a level of significance is not defined, an assessment of intra-project cumulative effects is not presented as it isn't possible to progress this assessment past the first stage. A full assessment of intra-project cumulative effects will, however, be presented in the ES.

5.8 Monitoring

5.8.1 Schedule 4, Paragraph 7 of the EIA Regulations (Ref 5.2) is clear that, where appropriate, the ES should include a description of any proposed monitoring arrangements where likely significant effects have been identified. The monitoring of significant effects requirements would be detailed within the ES topic chapters to include clear and proportionate objectives for monitoring, the parameters to be monitored, the methodology for the monitoring, a timescale for implementation, identification of the party who would be responsible for the monitoring, and an outline of the remedial actions to be undertaken should results be adverse.

5.9 Structure of the Technical Chapters

5.9.1 Each of the technical chapters (**Chapter 6 to 19**) are structured in general as follows:

- Introduction.
- Regulation and Planning Context.

- Scoping Opinion and Consultation.
- Assessment Approach and Methods.
- Baseline Conditions.
- Mitigation.
- Preliminary Assessment.

5.9.2 **Chapter 20 Substations and Associated Works** presents the preliminary environmental information for the Proposed Substation Works at Birkhill Wood and High Marnham. For each proposed substation the preliminary environmental information is presented for each of the topics below:

- Landscape;
- Visual;
- Ecology;
- Ornithology;
- Cultural Heritage;
- Water Environment;
- Geology and Hydrogeology;
- Agriculture and Soils;
- Traffic and Transport;
- Air Quality;
- Noise and Vibration;
- Socio-economics recreation and tourism;
- Health and Wellbeing; and
- Climate.

5.9.3 **Chapter 21 Cumulative Effects** is structured differently as it takes account of the advice provided in the Nationally Significant Infrastructure Projects: Advice on Cumulative Effects Assessment (Ref 5.7) to utilise an assessment matrix (as presented in Annex 1 of the advice) as a means of summarising the potential adverse or beneficial cumulative effects of the Project with 'other development' demonstrating that a systematic approach to CEA has been adopted using professional judgement.

5.10 References

Ref 5.1 National Grid (2023). Scoping Opinion Proposed North Humber to High Marnham September 2023. [online]. Available from https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/EN020034/EN020034-000009-EN020034%20North%20Humber%20to%20High%20Marnham%20-%20Scoping%20Opinion.pdf [Accessed December 2024]

Ref 5.2 H.M. Government (2017). The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 [online]. Available from: https://www.legislation.gov.uk/uksi/2017/572/regulation/31/made [Accessed December 2024]

Ref 5.3 Gov.uk (2020). Planning Inspectorates Nationally Significant Infrastructure Projects Advice Note Seven: Environmental Impact Assessment: Process, preliminary environmental information and environmental statements (June 2020). [online]. Available from: https://www.gov.uk/government/publications/nationally-significant-infrastructure-projects-advice-note-seven-environmental-impact-assessment-process-preliminary-environmental-information-an7 [Accessed December 2024]

Ref 5.4 National Grid (2023). North Humber to High Marnham Environmental Impact Assessment Scoping Report. [online]. Available at: https://national-infrastructure-consenting.planninginspectorate.gov.uk/projects/EN020034/documents [Accessed December 2024].

Ref 5.5 Planning Inspectorate (2022). National Significant Infrastructure Projects – Advice Note 9: Rochdale Envelope. [online]. Available at: https://www.gov.uk/government/publications/nationally-significant-infrastructure-projects-advice-note-nine-rochdale-envelope https://www.gov.uk/government/publications/nationally-significant-infrastructure-projects-advice-note-seventeen-cumulative-effects-assessment-relevant-to-nationally-significant-infrastructur/nationally-significant-infrastructure-projects-advice-note-seventeen-cumulative-effects-assessment-relevant-to-nationally-significant-infrastructure [Accessed September 2024].

Ref 5.6 Department of Energy and Net Zero (2023). Overarching National Policy Statement for Energy (EN-1). [online]. Available at: https://assets.publishing.service.gov.uk/media/65bbfbdc709fe1000f637052/overarching-nps-for-energy-en1.pdf [Accessed December 2024]

Ref 5.7 Planning Inspectorate (2024). National Significant Infrastructure Projects – Nationally Significant Infrastructure Projects: Advice on Cumulative Effects Assessment. [online]. Available at: [Accessed September 2024].

Ref 5.8 North Humber to High Marnham Transboundary Screening (June 2024). [online]. Available at: https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/EN020034/EN020034-000062-Regulation%2032%20Transboundary%20Screening.pdf [Accessed: October 2024)

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