

Norfolk Vanguard Offshore Wind Farm

Chapter 29

Landscape and Visual Impact Assessment

Environmental Statement

Volume 1

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Environmental Impact Assessment Environmental Statement

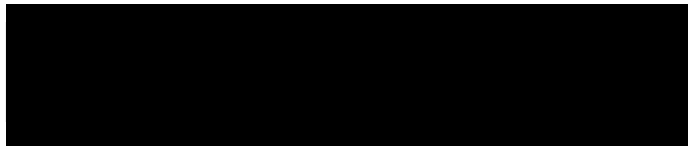
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For and on behalf of Norfolk Vanguard Limited

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Glossary

AOD	Above Ordnance Datum
AONB	Area of Outstanding Natural Beauty
CA	Conservation Area
CIA	Cumulative Impact Assessment
CLVIA	Cumulative Landscape and Visual Impact Assessment
CRS	Cable Relay Station
DCO	Development Consent order
EIA	Environmental Impact Assessment
ES	Environmental Statement
GIS	Geographical Information System
GLVIA	Guidelines for the Assessment of Landscape and Visual Impacts
HDD	Horizontal Directional Drilling
HE	Historic England
HVAC	High Voltage Alternating Current
HVDC	High Voltage Direct Current
LCA	Landscape Character Assessment
LCT	Landscape Character Types
LCU	Landscape Character Units
LI	Landscape Institute
LVIA	Landscape and Visual Impact Assessment
MA	Mobilisation Area
NCA	National Character Areas
NP	National Park
NPS	National Policy Statement
OLEMS	Outline Landscape and Ecology Management Strategy
OS	Ordnance Survey
PEIR	Preliminary Environmental Information Report
PRoW	Public Rights of Way
RPG	Registered Park and Garden
SEO	Statements of Environmental Opportunity
SNH	Scottish Natural Heritage
SoS	Secretary of State
WCS	Worst Case Scenario
ZTV	Zone of Theoretical Visibility

Terminology

Cable relay station	Primarily comprised of an outdoor compound containing reactors (also called inductors, or coils) and switchgear to increase the power transfer capability of the cables under the HVAC technology scenario as considered in the PEIR. This is no longer required for the project as the HVDC technology has been selected.
Indicative mitigation planting	Areas identified for mitigation planting at the onshore project substation and Necton National Grid substation.
Jointing pit	Underground structures constructed at regular intervals along the cable route to

	join sections of cable and facilitate installation of the cables into the buried ducts
Landfall	Where the offshore cables come ashore at Happisburgh South
Link boxes	Underground chambers or above ground cabinets next to the cable trench housing low voltage electrical earthing links.
Mobilisation area	Areas approx. 100 x 100m used as access points to the running track for duct installation. Required to store equipment and provide welfare facilities. Located adjacent to the onshore cable route, accessible from local highways network suitable for the delivery of heavy and oversized materials and equipment.
National grid overhead line modifications	The works which will be undertaken to complete the necessary modification to the existing 400kV overhead lines
National Grid substation extension	The permanent footprint of the National Grid substation extension
Necton National Grid substation	The existing 400kV substation at Necton, which will be the grid connection location for Norfolk Vanguard
Onshore 400kV cable route	Buried high-voltage cables linking the onshore project substation to the Necton National Grid substation
Onshore cable route	The 45m easement which will contain the buried onshore cables as well as the temporary running track, topsoil storage and excavated material during construction.
Onshore cables	The cables which take the electricity from landfall to the onshore project substation
Onshore project area	All onshore electrical infrastructure (landfall; onshore cable route, accesses, trenchless crossing technique (e.g. Horizontal Directional Drilling (HDD)) zones and mobilisation areas; onshore project substation and extension to the Necton National Grid substation and overhead line modification)
Onshore project substation	A compound containing electrical equipment to enable connection to the National Grid. The substation will convert the exported power from HVDC to HVAC, to 400kV (grid voltage). This also contains equipment to help maintain stable grid voltage.
Onshore project substation temporary construction compound	Land adjacent to the onshore project substation which would be temporarily required during construction of the onshore project substation.
Running track	The track along the onshore cable route which the construction traffic would use to access workfronts.
The Applicant	Norfolk Vanguard Limited.
The project	Norfolk Vanguard Offshore Wind Farm, including the onshore and offshore infrastructure.
Transition pit	Underground structures that house the joints between the offshore export cables and the onshore cables within the landfall
Trenchless crossing zone (e.g. HDD)	Temporary areas required for trenchless crossing works.
Workfront	The 150m length of onshore cable route within which duct installation would occur

29 LANDSCAPE AND VISUAL IMPACT ASSESSMENT

29.1 Introduction

1. This chapter of the Environmental Statement (ES) presents the Landscape and Visual Impact Assessment (LVIA) for the proposed Norfolk Vanguard project (herein ‘the project’). The chapter provides an overview of the existing environment where the onshore project area is proposed, followed by an assessment of the potential impacts and associated mitigation for the onshore area of the project during the construction, operation and decommissioning phases.
2. The assessment has been undertaken by Optimised Environments Ltd (OPEN) on behalf of Norfolk Vanguard Limited. The assessment has been prepared in accordance with National Policy Statements (NPSs) with specific reference to Overarching NPS for Energy (NPS EN-1) (July 2011).
3. The assessment also considers cumulative impacts of other proposed projects. The methodology adhered to for the LVIA and Cumulative Impact Assessment (CIA) is discussed in section 29.4.
4. The focus of the chapter is on the landscape character and visual amenity. The seascape assessment of the offshore electrical transmission works has been scoped out of the LVIA owing to the distance of these works offshore. This approach has been agreed with the Secretary of State (SoS) via the Scoping Opinion in November 2016. The scope of the assessment is presented in section 29.5.
5. A detailed description of the onshore project area is presented in Chapter 5 Project Description and a summary of the worst case scenario relating to the LVIA is presented in [Table 29.8](#).
6. Owing to the close association between landscape character, visual amenity, heritage and ecology this chapter should also be read in conjunction with the other related ES chapters (and their appendices and supporting documents). The relevant chapters are:
 - Chapter 22 Onshore Ecology;
 - Chapter 28 Onshore Archaeology and Cultural Heritage; and
 - Chapter 30 Tourism and Recreation.

29.2 Legislation, Guidance and Policy

7. There are a number of pieces of legislation, policy and guidance applicable to landscape and visual receptors. The following sections provide detail on key pieces of international and UK legislation, policy and guidance which are relevant to this chapter.

29.2.1 Guidance

8. The assessment takes account of the methods outlined in the following best practice guidance documents:
- The Landscape Institute with the Institute of Environmental Management and Assessment (2013). Guidelines for Landscape and Visual Impact Assessment. Third Edition (GLVIA 3);
 - Natural England and the Department for Environment, Food and Rural Affairs (2014). Landscape and Seascape Character Assessments;
 - Natural England (2014). An Approach to Landscape Character Assessment;
 - Scottish Natural Heritage (2012). Assessing the Cumulative Impact of Onshore Wind Energy Developments;
 - Scottish Natural Heritage (February 2017). Visual Representation of Wind Farms: Version 2.2;
 - The Landscape Institute (2011). Landscape Institute Advice Note 01/11, Photography and photomontage in landscape and visual impact assessment; and
 - The Landscape Institute (March 2017). Landscape Institute Technical Guidance Note 02/17, Visual Representation of development proposals.

29.2.2 National Policy Statements

9. The assessment of potential impacts on the landscape and visual receptors has been made with reference to relevant NPSs, as discussed in Chapter 3 Policy and Legislative Context. The relevant NPSs to this assessment are:
- Overarching National Policy Statement for Energy (NPS EN-1 July 2011);
 - National Policy Statement for Renewable Energy Infrastructure (NPS EN-3 July 2011); and
 - National Policy Statement for Electricity Networks Infrastructure (NPS EN-5 July 2011).
10. The specific assessment requirements for landscape and visual receptors, as detailed in the NPSs, are summarised in Table 29.1.

Table 29.1 NPS assessment requirements

NPS Requirement	NPS Reference	ES Reference
EN-1 Overarching NPS for Energy		
Paragraph 5.9.5 of EN-1 advises that the applicant should carry out a landscape and visual assessment and makes reference to the following documents: <ul style="list-style-type: none"> • Landscape Institute and Institute of Environmental Management and Assessment (2002, 2nd edition): Guidelines for Landscape and Visual Impact Assessment; and 	Paragraph 5.9.5	'The Guidelines for Landscape and Visual Impact Assessment' (GLVIA) (2002, 2nd edition) has been superseded by GLVIA Version 3. Landscape Character

NPS Requirement	NPS Reference	ES Reference
<ul style="list-style-type: none"> Land Use Consultants (2002): Landscape Character Assessment – Guidance for England and Scotland. 		<p>Assessment – Guidance for England and Scotland has been superseded by Natural England’s ‘An Approach to Landscape Character Assessment’.</p> <p>This LVIA has been prepared following the updated versions of these documents which are referred to in Appendix 29.1 LVIA Methodology.</p>
<p>“The landscape and visual assessment should include reference to any landscape character assessment and associated studies as a means of assessing landscape impacts relevant to the proposed project. The applicant’s assessment should also take account of any relevant policies based on these assessments in local development documents in England.”</p>	<p>Paragraph 5.9.5</p>	<p>Published character assessments for the study area and policies are referred to in section 29.6.2 of the LVIA.</p>
<p>“The applicant’s assessment should include the effects during construction of the project and the effects of the completed development and its operation on landscape components and landscape character.”</p>	<p>Paragraph 5.9.5</p>	<p>The effect on landscape components and landscape character during construction and operation are assessed in section 29.7 of the LVIA.</p>
<p>“The assessment should include the visibility and conspicuousness of the project during construction and of the presence and operation of the project and potential impacts on views and visual amenity.”</p>	<p>Paragraph 5.9.7</p>	<p>The visual effect of the project during construction and operation are assessed in section 29.7 of the LVIA.</p>
<p>“Landscape effects depend on the existing character of the local landscape, its current quality, how highly it is valued and its capacity to accommodate change. All of these factors need to be considered in judging the impact of a project on landscape. Virtually all nationally significant energy infrastructure projects will have effects on the landscape. Projects need to be designed carefully, taking account of the potential impact on the landscape. Having regard to siting, operational and other relevant constraints the aim should be to minimise harm to the landscape, providing reasonable mitigation where possible and appropriate.”</p>	<p>Paragraph 5.9.8</p>	<p>The quality, value and capacity of the landscape to accommodate change are considerations of the landscape assessment. The design of the project has considered the potential impact on the landscape in order to minimise harm by mitigation of landscape effects as presented in section 29.7.1 of the LVIA.</p>
<p>“The duty to have regard to the purposes of nationally designated areas also applies when considering applications for projects outside the boundaries of these areas which may have impacts within them. The aim should be to avoid compromising the purposes of designation and such projects should be designed sensitively given the various siting, operational, and other relevant constraints.’ ... and paragraph 5.9.13 advises ‘The fact that a proposed project will be visible</p>	<p>Paragraph 5.9.12</p>	<p>The potential for the project to affect the Norfolk Coast Area of Outstanding Natural Beauty (AONB), The Broads National Park (NP) and Registered Parks and Gardens (RPG), has been</p>

NPS Requirement	NPS Reference	ES Reference
from within a designated area should not in itself be a reason for refusing consent.”		considered in section 29.6 and assessed in section 29.7 of the LVIA.
“Outside nationally designated areas, there are local landscapes that may be highly valued locally and protected by local designation. Where a local development document in England has policies based on landscape character assessment, these should be paid particular attention. However, local landscape designations should not be used in themselves to refuse consent, as this may unduly restrict acceptable development.”	Paragraph 5.9.14	The value of the local landscape is a consideration within the LVIA and assessed in respect of each landscape receptor in section 29.7.
“The IPC [now the Planning Inspectorate and the Secretary of State] should consider whether the project has been designed carefully, taking account of environmental effects on the landscape and siting, operational and other relevant constraints, to minimise harm to the landscape, including by reasonable mitigation.”	Paragraph 5.9.16	Chapter 4 Site Selection and Assessment of Alternatives of the ES sets out the iterative process that has influenced the design of the project. The mitigation of landscape and visual effects has been carefully considered in the LVIA, to minimise ‘harm to the landscape’ where possible.
“It may be helpful for applicants to draw attention, in the supporting evidence to their applications, to any examples of existing permitted infrastructure they are aware of with a similar magnitude of impact on sensitive receptors. This may assist the IPC in judging the weight it should give to the assessed visual impacts of the proposed development.”	Paragraph 5.9.19	Chapter 5 Project Description includes examples of the type of infrastructure to be used and their likely parameters / dimensions. Figures 29.13-29.24 contain visualisations to simulate the potential view of infrastructure from likely sensitive receptors.
“Within a defined site, adverse landscape and visual effects may be minimised through appropriate siting of infrastructure within that site, design including colours and materials, and landscaping schemes, depending on the size and type of the proposed project. Materials and designs of buildings should always be given careful consideration.”	Paragraph 5.9.22	Mitigation through detailed landscape proposals will be a consideration in terms of the mitigation of landscape and visual effects. These are presented in section 29.7.1 and described in more detail in Outline Landscape and Ecology Mitigation Strategy (OLEMS) (document reference 8.7). The Design and Access Statement (document reference 8.3) deals with issues of design.

NPS Requirement	NPS Reference	ES Reference
EN-3 NPS for Renewable Energy Infrastructure		
“Proposals for renewable energy infrastructure should demonstrate good design in respect of landscape and visual amenity, and in the design of the project to mitigate impacts such as noise and effects on ecology.”	Paragraph 2.4.2	Project design has avoided sensitive features where possible. Embedded mitigation measures are presented in section 29.7.1 and mitigation measures are described in more detail in OLEMS (document reference 8.7).
EN-5 NPS for Electricity Networks Infrastructure		
“New substations, sealing end compounds and other above ground installations that form connection, switching and voltage transformation points on the electricity networks can also give rise to landscape and visual impacts. Cumulative landscape and visual impacts can arise where new overhead lines are required along with other related developments such as substations, wind farms and/or other new sources of power generation.”	Paragraph 2.8.2	The potential effects of the onshore project substation, National Grid substation extension and overhead line modification have been assessed in the LVIA in sections 29.7 and 29.8.

29.3 Consultation

11. Consultation is a key driver of the Environmental Impact Assessment (EIA) and ES and is an ongoing process throughout the lifecycle of the project, from the initial stages through to consent and post-consent. To date, consultation regarding landscape and visual receptors has been conducted through ETG meetings held in January 2017, July 2017 and January 2018 with Norfolk County Council, North Norfolk District Council, Breckland Council, Norfolk Coastal Partnership, Natural England and Historic England. The Scoping Report (Royal HaskoningDHV, 2016) and Preliminary Environmental Information Report (PEIR) (Norfolk Vanguard Limited, 2017) have also been consulted on. Comments submitted by consultees have been taken into consideration within this ES. Full details of the project consultation process are presented within Chapter 7 Technical Consultation. A Consultation Report (document reference 5.1) has also been submitted with the Development Consent Order (DCO) application.
12. Consultee responses to the Norfolk Vanguard Environmental Impact Assessment Scoping Report and the Norfolk Vanguard PEIR are presented in Appendix 29.2 Consultation Responses. A summary of the consultation process is presented in Table 29.2.

Table 29.2 Consultation process

Consultation stage	Consultees	Purpose of consultation
Scoping Opinion November 2016	SoS, Natural England, Norfolk County Council, Broadland District Council	Establish scope of the LVIA. Agreement to scope out offshore assessment and operational phase of landfall and onshore cable route both independently and cumulatively.
LVIA ETG Meeting January 2017	Norfolk County Council, North Norfolk District Council, Breckland Council, Broadland District Council, Natural England.	Review site selection process. Discuss viewpoint locations. Discuss content of LVIA and methodology.
LVIA ETG Meeting July 2017	Norfolk County Council, North Norfolk District Council, Breckland Council, Broadland District Council.	Review site selection process. Agree viewpoint locations. Agree content of LVIA and methodology.
PEIR Review November / December 2017	Norfolk County Council, North Norfolk District Council, Breckland District Council, Capita on behalf of Breckland District Council, Broadland District Council, Norfolk Coastal Partnership, Natural England, Historic England, National Trust, East Rushton Parish Council, Necton Parish Council, NSAG, N2RS and Orsted (Hornsea Three Project).	To gain feedback on PEIR, with comments made on LVIA methodology, content and structure, assessment findings, production and verification of visualisations and mitigation planting.
LVIA ETG Meeting January 2018	Norfolk County Council, North Norfolk District Council, Breckland Council, Norfolk Coastal Partnership, Natural England and Historic England.	Review PEIR comments. Agree updates required to progress PEIR to ES.

13. Norfolk Vanguard Limited has reviewed consultation received and, in light of the feedback, has made a number of decisions in relation to the project design. One of those decisions is to deploy High Voltage Direct Current (HVDC) cable technology to the UK's National Grid and this removes the need for a Cable Relay Station (CRS) from the project. Consultation comments regarding the CRS are, therefore not referenced in Appendix 29.2. Assessment of the potential impacts of the CRS as presented in the PEIR have been removed from the ES.

29.4 Assessment Methodology

29.4.1 LVIA Methodology

14. Chapter 6 EIA Methodology describes the methodology used throughout the ES. While the LVIA methodology broadly accords with this methodology, it has been developed to assess the potential impacts on landscape and visual receptors relating

to energy developments, and therefore presents a more specific methodology relevant to this topic as agreed by relevant stakeholders. Appendix 29.1 sets out the full methodology for the LVIA, while a summary of the key approach is presented below.

15. The LVIA assesses the potential impacts of the project on landscape elements, landscape character and visual receptors within the study areas, as described in section 29.5.1. This includes the likely impacts of the onshore components of the landfall, onshore cable route, onshore project substation, National Grid substation extension, National Grid overhead line temporary works and other associated infrastructure (e.g. access tracks and mobilisation areas).
16. The LVIA has been carried out using a methodology specifically devised by OPEN which generally accords with GLVIA 3 guidance. Where it diverges from specific aspects of this guidance, in a small number of areas, reasoned professional justification for this is presented in Appendix 29.1.
17. The potential impacts of the project on the landscape and visual receptors are grouped into four categories: physical effects, effects on landscape character, effects on views, and cumulative effects.
18. Physical effects are restricted to the onshore project area; these are the direct effects on the fabric of the site, such as the removal or addition of trees and alteration to ground cover. The receptors in this case are landscape elements.
19. Effects on landscape character arise either through the introduction of new elements that physically alter the pattern of elements that makes up landscape character, or through visibility of the project, which may alter the way in which the pattern of elements is perceived. The receptors in this case are landscape character receptors, which are landscape character types and designated landscapes.
20. The assessment of effects on views is an assessment of how the introduction of the project would affect the views experienced by people throughout the study areas. The assessment of effects on views is carried out in two parts:
 - An assessment of the effects that the project would have on a series of viewpoints that have been selected to represent the views experienced by people, for example, residents, walkers and road-users, throughout the study areas; and
 - An assessment of the effects that the project would have on views from principal visual receptors, which are the notable settlements, routes, features and attractions found throughout the study areas.

21. Cumulative effects arise where the study areas for two or more developments overlap so that both developments are experienced at proximity where they may have an incremental effect, or where developments may combine to have a sequential effect, irrespective of any overlap in visibility. CIAs typically include existing developments that make up the baseline, other developments that are under construction and consented, and those for which planning applications have been submitted. In respect of sites that are at scoping stage, SNH advice (SNH, 2012) states *'Occasionally it may be appropriate to include proposals which are in the early stages of development in an assessment, particularly where clusters of developments or 'hotspots' emerge.'*

29.4.1.1 Impact significance

22. The broad objective in assessing the effects is to determine, as required by the 2017 EIA Regulations, any predicted significant effects of the project on the landscape and visual resource. In the LVIA, effects will be assessed to be either significant or not significant.
23. The significance of effects is assessed through a combination of two considerations; (i) the sensitivity of the landscape element, landscape character receptor, view or visual receptor, and (ii) the magnitude of change that will result from the introduction of the project.
24. OPEN's methodology for assessing energy developments is not reliant on the use of a matrix to determine the significance of landscape and visual effects, nor does it define levels of significance. It is, however, considered useful to include a matrix in the methodology to illustrate how combinations of sensitivity and magnitude of change can give rise to a significant effect and to provide an understanding as to the threshold at which significant effects may arise. Table 29.3 below provides this illustration.
25. Chapter 6 EIA Methodology presents Table 6.1 'Significance of an impact resulting from each combination of receptor sensitivity and the magnitude of effect'. Table 29.3 below, largely concurs with Table 6.1, with the exception of its reference to 'significant' and 'not significant' effects, rather than 'major', 'moderate' or 'minor' effects and the use of one table for both adverse and beneficial effects. The nature of effects relating to landscape and visual impacts are likely to be adverse in nature, unless otherwise stated, as described in section 29.4.1.2.

Table 29.3 Impact significance matrix

Sensitivity	Magnitude of change					
	High	Medium/ High	Medium	Medium/ Low	Low	Negligible
High	Significant	Significant	Significant	Significant/ Not significant	Not significant	Not significant
Medium/ High	Significant	Significant	Significant/ Not significant	Significant/ Not significant	Not significant	Not significant
Medium	Significant	Significant/ Not significant	Significant/ Not significant	Not significant	Not significant	Not significant
Medium/ Low	Significant/ Not significant	Significant/ Not significant	Not significant	Not significant	Not significant	Not significant
Low	Significant/ Not significant	Not significant	Not significant	Not significant	Not significant	Not significant

26. In accordance with GLVIA3, experienced professional judgement is applied to the assessment of all effects and reasoned argument is presented in respect of the findings in each case.
27. Definitions of significance are presented in Table 29.4 below.

Table 29.4 Impact significance definitions

Impact Significance	Definition
Significant	A significant impact would occur where the project has a defining impact on the landscape receptor or visual receptor.
Not significant	An impact is not significant where the project does not have a defining impact on the landscape receptor or visual receptor.

28. Where the assessment identifies significant effects on landscape and visual receptors, these will be mitigated during the construction, operation and decommissioning of the project. Embedded mitigation has been developed as part of the overall project design through site selection and detailed design where possible. The iterative design process has involved the consideration of the sensitivity of the landscape and visual receptors with the aim of mitigating the effects on those more sensitive receptors, especially where visual amenity of

residents is a concern. For more information on embedded mitigation, see section 29.7.1.

29.4.1.2 Nature of effect

29. The landscape and visual assessment identifies ‘beneficial’ and ‘adverse’ effects by considering these under the term ‘nature of effect’. The nature of effect is defined in relation to specific definitions for beneficial, neutral or adverse effects as follows:

- Beneficial effects contribute to the landscape and visual resource through the enhancement of desirable characteristics or the introduction of new, positive attributes. The removal of undesirable existing elements or characteristics can also be beneficial, as can their replacement with more appropriate components;
- Neutral effects occur where the project neither contributes to nor detracts from the landscape and visual resource or where the effects are so limited that the change is hardly noticeable. A change to the landscape and visual resource is not considered to be adverse simply because it constitutes an alteration to the existing situation. Neutral effects may arise where the effect of the project is neither overtly beneficial or adverse, where it achieves a suitable relationship with the landscape or view, all things considered; and
- Adverse effects are those that detract from or weaken the landscape and visual resource through the introduction of elements that contrast with the existing characteristics of the landscape and visual resource, or through the removal of elements that are key in its characterisation.

30. Judgements on the nature of effect are based on professional experience and reasoned opinion informed by best practice guidance.

29.4.2 Cumulative Impact Assessment

31. Chapter 6 EIA Methodology presents the general CIA methodology and summarises the different steps of the CIA as applied for this chapter. Appendix 29.1 sets out the more detailed methodology specific to the requirements of the LVIA process.

32. The objective of the CIA for the LVIA is to describe, visually represent and assess the ways in which any additional impacts associated with the project when considered together with other consented or proposed developments and to identify related significant cumulative impacts arising as a result of the addition of the project. The guiding principle in preparing the CIA is to *‘focus on the likely significant impacts and in particular those which are likely to influence the outcome of the consenting process’*, in accordance with Scottish Natural Heritage (SNH) guidance.

33. Projects with the potential to contribute to a significant cumulative impact are presented in Table 29.13 along with an initial assessment of their relevance to the cumulative assessment. The onshore project substation, National Grid substation

extension and overhead line modifications are the only above ground elements of the project with the potential to give rise to cumulative effects during operation. During the construction of the onshore cable route, there is the potential for a significant effect to arise in conjunction with Hornsea Project Three onshore cable route in the localised area where the cable routes cross and where construction compounds are located, to the north-east of Reepham. The CIA focuses on the most relevant cumulative sites as recommended in the Planning Inspectorate's advice note nine: Rochdale Envelope (2011).

29.4.3 Transboundary Impact Assessment

34. The scope of this chapter focusses on the onshore elements of the project and so there is no pathway for transboundary impacts and therefore no further consideration of this topic within the assessment.

29.5 Scope

29.5.1 Study Area

35. The boundaries of the study areas used in the LVIA, generally define a limit beyond which professional judgement considers it would be unlikely for significant landscape and visual impacts to arise. This judgement is based on previous working knowledge of similar projects and an understanding of the character of the local landscape and scale of the construction and components of the project. In respect of the onshore project substation and National Grid substation extension, Zone of Theoretical Visibility (ZTV) maps have been used to inform this process (Figures 29.5, 29.6 and 29.8).
36. The study area for the landfall extends to a radius of 1km around the outer extent of the landfall site. The study area for the onshore cable route extends to a continuous band of 1,045m, with 500m on either side of the outer edge of the onshore cable route, which is 45m wide. This 1,045m band extends along the 60km length of the onshore cable route. Where mobilisation areas and trenchless crossing (e.g. HDD) compounds occur, the 500m buffer is applied to the outer extent of these areas. The study area is shown on Figures 29.2 and 29.3.
37. In respect of the onshore project substation, National Grid substation extension and overhead line modification, a study area of a 3km radius has been applied to both sites. The ZTVs in Figures 29.5 and 29.6 show how theoretical visibility would largely be contained within this 3km radius. It shows how continuous theoretical visibility would be concentrated within the first 1 to 2km, with visibility to the east, especially restricted by intervening woodland. To the north and west, visibility becomes patchier towards the 3km boundary while to the south, visibility is limited through the valley at a range of 2km, but then resumes onto the ridgeline to the south,

extending approximately 0.5km beyond the 3km boundary. Site reconnaissance has shown that while there may be the possibility for actual visibility to occur beyond 3km, the separation distance combined with the extent of intervening tree and hedgerow cover would limit the potential for significant effects to arise.

29.5.2 Desk Study and Field Survey

38. The assessment has been initiated through a desk study of the landfall, onshore cable route, onshore project substation, National Grid substation extension and overhead line modification and their associated study areas. This study has identified aspects of the landscape and visual resource that will need to be considered in the landscape and visual assessment, including landscape-related planning designations, landscape character typology, routes (including roads, National Cycle Routes and long-distance walking routes), settlements and cumulative developments.
39. The desk study has also utilised Geographic Information System (GIS) and Visual Nature Studio software to explore the potential visibility of the project. The resultant ZTV diagrams (Figures 29.5 and 29.6) and photomontages have provided an indication of which landscape and visual receptors are likely to be key in the assessment.
40. Field surveys have been carried out throughout the study areas, with the focus on the area that covers the site and those areas that are shown on ZTVs to gain theoretical visibility of the project. The field survey has identified relevant landscape and visual receptors and an assessment has been carried out regarding their sensitivity to the project. Representative viewpoints have also been identified and photography undertaken to present the baseline character and form the basis for photo-montages of the onshore project substation. Field surveys have assisted the iterative process of site selection by highlighting the actual visibility and prominence of sites and the relative sensitivity of surrounding receptors.

29.5.3 Data Sources

41. The data sources used to inform the assessment, and the confidence levels associated with each data source, are listed in [Table 29.5](#) below.

Table 29.5 Data sources

Data	Year	Coverage	Confidence	Notes
Ordnance Survey 25,000 Raster from Norfolk Vanguard Limited	2016	Mapping information	High	-
Ordnance Survey 250,000 Raster from OS OPEN data	2016	Mapping information	High	-

Data	Year	Coverage	Confidence	Notes
North Norfolk Landscape Character Assessment	2009	Classification of North Norfolk landscape into character types	High	Based on Countryside Agency Guidelines
Broadland Landscape Character Assessment	2013	Classification of Broadland landscape into character types	High	Based on Natural England Guidelines
Breckland Landscape Character Assessment	2007	Classification of Breckland landscape into character types	High	Based on Countryside Agency Guidelines
Norfolk Coast AONB	2016	Identification of a landscape of national importance	High	Data downloaded from Natural England
The Broads National Park	2016	Identification of a landscape of national importance	High	Data downloaded from Natural England
Register of Historic Parks and Gardens	2016	Listing of protected Historic Parks and Gardens in England	High	Designation undertaken by Historic England (HE) with process set out on website
Norfolk Vanguard Scoping Report and Consultation Comments	2016	Defining scope of Norfolk Vanguard	High	Feedback provided by statutory and other consultees on scope of EA.
Consultation with Norfolk County Council	Ongoing	Agreement on issues relevant to Norfolk Vanguard LVIA	High	Consultation of issues relevant to LVIA with council officers
Guidelines for Landscape and Visual Impact Assessment	2013	Accepted guidance for the production of LVIA	High	Guidelines setting out methodology and approach for LVIA

29.5.4 Assumptions and Limitations

29.5.4.1 Zone of Theoretical Visibility

42. The ZTV has been generated using GIS software (ESRI ArcGIS Version 10.5) to demonstrate the extent to which the onshore project substation and National Grid substation extension may theoretically be seen from any point in the study area. These ZTVs are shown in Figures 29.5 and 29.6.
43. The zones of theoretical visibility are calculated based on the height of the landform relative to the height of the project. They also factor in the potential screening effect of areas of woodland in the study area, to which an average height of 10m has been

attributed, which is considered a conservative average. The ZTVs do not take into account the screening effect of smaller groups of trees, hedgerows, hedgerow trees, buildings or other local features and this is highlighted in the limitations set out below.

44. There are limitations in the production of ZTVs, and these should be considered in the interpretation and use of the ZTV:
 - The ZTV illustrates the ‘bare ground’ situation with major woodland blocks reflected, but does not take into account the screening effects of other vegetation, buildings, or other local features that may prevent or reduce visibility;
 - The ZTVs are based on theoretical visibility from 2m above ground level; and
 - The ZTVs are based on 5m data grid (OS Terrain 5).
45. These limitations mean that while the ZTV is used as a starting point in the assessment, providing an indication of locations where the project would theoretically be visible, the information drawn from the ZTV is checked in the field, to ensure that the assessment conclusions represent the likely actual visibility of the project.

29.5.4.2 Visualisations

46. The viewpoint assessment is illustrated by a range of visualisations, including photographs and photomontages, which accord with SNH’s Visual Representation of Wind Farms Version 2.2 (SNH, 2017). In the absence of detailed guidance on the production of photomontages for non-wind farm developments, the Landscape Institute (LI) in its Advice Note 01/11 makes the following comment:
 - *“Scottish Natural Heritage’s Visual representation of windfarms: good practice guidance states that the guidance may also be applicable to other forms of development or within other locations. The LI endorses this guidance and strongly advises members to follow this where applicable in preference to any other guidance or methodology.”*
47. Although the onshore elements of the project do not constitute a wind farm, the SNH guidance has been applied in the production of the photomontages. In PEIR, 90-degree field of view frames were presented for each viewpoint. However, through PEIR consultation and further site work, it has been agreed that 53.5-degree field of view frames would assist interpretation of the likely effects of the project and are more appropriate for the purposes of the assessment. The 53.5-degree field of view frames show an enlarged image of the development, which is considered more authentic in conveying the likely actual scale that would be experienced on site. A 90-degree baseline photograph frame has also been included to illustrate the wider context of the views experienced from each viewpoint.

48. Chapter 6 EIA Methodology Section 6.4, 'The Project Design Envelope', explains how the project EIA will be based on the 'Rochdale Envelope' approach, as supported by The Planning Inspectorate Advice Note Nine (The Planning Inspectorate, 2012). The Rochdale Envelope presents the parameters of the project which represent the worst-case scenario. This ensures the DCO application covers the maximum possible extent of the project. Visualisations in Figures 29.13 to 29.24 therefore present a Rochdale Envelope approach, marked by a blue dashed 3D box around the computer-generated model, indicating the maximum possible extent of the project. This ensures that the LVIA considers the worst case scenario in respect of both the National Grid substation extension and the onshore project substation.
49. The design of the National Grid substation extension is represented by a computer-generated model indicating the worst case scenario, set within the parameters of the Rochdale Envelope. This ensures that if any modifications to the design are made, these will occur within the worst case scenario assessed.
50. The design of the onshore project substation will be further developed within the parameters set by the Rochdale Envelope. The computer-generated model included in the visualisations provides an indicative representation of the worst case scenario within the Rochdale Envelope and this has formed the basis of the LVIA. Those aspects of the design that would not change include the footprint of the development (250m x 300m), the maximum height of the buildings (19m), the maximum height of the lightning protection masts (25m) and the general infrastructure of indoor converter halls and outdoor electrical infrastructure. The computer-generated model has been included in the photomontages to give an impression of the general appearance and character of the onshore project substation, set within the parameters of the Rochdale envelope.
51. Visualisations of energy developments have a number of limitations when using them to form a judgement on the effects of this type of development. These include:
 - A visualisation can never show exactly what the energy development will look like in reality due to factors such as: different lighting, weather and seasonal conditions which vary through time and the resolution of the image;
 - The images give a reasonable impression of the scale of the energy developments and the distance from the viewpoint and, whilst they have been produced to accord with best practice guidance, can never be 100% accurate;
 - The viewpoints illustrated are representative of views in the area, but cannot represent visibility at all locations;
 - To form the best impression of the impacts of the development these images are best viewed in the field at the viewpoint location shown; and

- The visualisations must be printed at the right size to be viewed properly (A1 width) and viewed at a comfortable viewing distance.
52. The photographs used to produce the photomontages have been taken using Canon EOS 5D and 6D Digital SLR cameras, with a fixed lens and a full-frame (35mm negative size) CMOS sensor. The photographs are taken on a tripod with a pano-head at a height of approximately 1.5m above ground.
 53. To create the baseline panorama, the frames are individually cylindrically-projected and then digitally joined to create a fully cylindrically-projected panorama using Adobe Photoshop or PTGui software. This process avoids the wide-angle effect that would result should these frames be arranged in a perspective projection, whereby the image is not faceted to allow for the cylindrical nature of the full 360-degree view but appears essentially as a flat plane. These should be viewed flat at a comfortable arm's length. These images are each printed on paper 841 x 297 mm (half A1), which provides for a relatively large-scale image.
 54. Tonal alterations are made using Adobe software to create an even range of tones across the photographs once joined.
 55. 3D model views that illustrate the onshore project substation and National Grid substation extension within a computer-generated image of the landform are used in the assessment to present an indicative appearance of the project. These are produced with Visual Nature Studio software and are based on the OS Terrain 5 digital terrain model with a 5m data grid (OS Terrain 5). There are limitations in the accuracy of DTM data so that finer elements of landform may not be picked up precisely and may result in parts of the onshore project substation or National Grid substation extension, being more or less visible than is shown, however, the use of OS Terrain 5 minimises these limitations. Where descriptions within the assessment identify the extent of onshore infrastructure visible this refers to the illustrations generated and therefore the reality may differ to a degree from these impressions. The modifications to the overhead line, which include an additional tower and an incremental change in the location and height of another tower, are included in the ES photomontages.
 56. Photomontages have been produced for all the representative viewpoints, using Adobe Photoshop software, to provide a realistic image of the appearance of the proposal. For most views, these include the introduction of the onshore project substation and National Grid substation extension only, as these are the elements that create the greatest change in views and are likely to be most visible from the surrounding area. The location and scale of the computer-generated model has been verified using markers such as the existing transmission towers, the existing substations, church towers and other fixed built features in the landscape.

57. The photographs and photomontages used in this assessment are for illustrative purposes only and, whilst useful tools in the assessment, are not considered to be completely representative of what will be apparent to the human eye. The assessments are carried out from observations in the field and therefore may include elements that are not visible in the photographs.
58. GPS readings and accurate aerial photography have been used to verify viewpoint locations and markers within the OS terrain model, which is referenced to the OS British National Grid co-ordinate system.
59. In respect of the onshore project substation and National Grid substation extension, there are twelve representative viewpoints shown in Figures 29.13 to 29.24. Viewpoints 1 to 8 were agreed with Statutory Consultees involved in the LVIA (ETG) Meetings, while Viewpoints 9 to 12 were added in response to comments raised at these meetings. The figures for each viewpoint show the following;
- Location map of the viewpoint, baseline photograph and computer-generated model;
 - Photomontage of Norfolk Vanguard onshore project substation, National Grid substation extension and overhead line modifications;
 - Photomontage of Norfolk Vanguard onshore project substation, National Grid substation extension overhead line modifications and mitigation planting;
 - Photomontage of Norfolk Vanguard onshore project substation, and National Grid substation extension, Norfolk Boreas onshore project substation and National Grid substation extension, and overhead line modifications; and
 - Photomontage of Norfolk Vanguard onshore project substation and National Grid substation extension, Norfolk Boreas onshore project substation and National Grid substation extension, overhead line modifications, and with mitigation planting for both projects.

29.5.4.3 Public access

60. The assessment has been carried out from publicly accessible areas. In instances where parts of these areas have been inaccessible, other sources of information have been used and professional judgement has been applied in the interpretation of these sources. For example, where sections of the busy A47 have been inaccessible owing to the health and safety risks, then stopping places nearby have been used in order to gain a similar experience and the assessment has been supplemented through the use of Google Earth to better understand the experience from the road.

29.6 Existing Environment

29.6.1 Introduction

61. The existing baseline environment associated with the onshore infrastructure of the project are described in Appendix 29.3 Existing Environment and summarised below.
62. This section presents an overview of the different landscape character types, landscape designations and visual receptors in order to ‘set the scene’ for the assessment. Desk-based studies have been supplemented with on-site observations regarding the local baseline environments in terms of characteristics and features that will be relevant to the detailed assessments.
63. The baseline descriptions, combined with an overview of the sensitivities of receptors to the project, act to identify those receptors that are susceptible to being significantly affected and, this assists in defining the scope of the assessment. Further baseline description and evaluation of sensitivity is to be found in the main assessment in section 29.7 and cumulative assessment in section 29.8, alongside the assessment of the effects on the individual receptors.

29.6.2 Landscape Character

64. The English landscape is classified at the national level by National Character Areas (NCAs). The 159 NCAs, which cover England, were originally identified by the Countryside Agency. This mapping and the associated descriptions have been revised and developed by Natural England into NCA profiles which provide a recognised, national, spatial framework. The location of the NCAs are shown in Figure 29.2.
65. The study areas for Norfolk Vanguard are within the following NCAs:
 - Landfall – North East Norfolk and Flegg (79) and The Broads (80);
 - Onshore cable route – Central North Norfolk (78) and Mid Norfolk (84); and
 - Onshore project substation – Mid Norfolk (84).
66. Each of Natural England’s NCA citations includes ‘*Statements of Environmental Opportunity*’ (SEOs). These are of relevance to the LVIA in respect of replacement planting and embedded mitigation, insofar as certain aims and objectives of the SEOs have been accommodated within the landscape mitigation for the onshore project substation and National Grid substation extension. Replacement planting and embedded mitigation are described in section 29.7.1.
67. Local Authorities across England have produced Landscape Character Assessments (LCA) for their administrative areas which subdivide the broader NCAs into more detailed Landscape Character Types (LCTs) and Landscape Character Units (LCUs),

hereafter described as LCUs. The more local scale of landscape characterisation has been used to inform the baseline descriptions. The relevant LCAs in Norfolk include the following;

- North Norfolk Landscape Character Assessment (June 2009);
- Broadland District Landscape Character Assessment (Sept 2013);
- Breckland District Landscape Character Assessment (May 2007); and
- North and South Brecks Landscape Character Assessment (Oct 2013).

68. The distribution of the LCTs and LCUs within the potential study areas and described by these LCAs, is shown in Figure 29.2 and described in Appendix 29.3:

29.6.2.1 Summary of landscape character

69. The effects on the LCTs and LCUs which occur in the study area of the onshore project substation and National Grid substation extension are assessed in section 29.7. The assessment considers the sensitivity and the magnitude of change that would arise as a result of the project and whether the resultant effect would be significant or not significant.

70. The effects of the landfall and onshore cable route would be too small in scale and temporary in nature to give rise to significant effects on the broader scale LCTs and LCUs in which they occur and, therefore, these effects are not assessed in section 29.7.

29.6.3 Landscape Designations

71. There are three types of landscape designation which are of relevance to the LVIA and lie within the LVIA study areas.

- AONBs;
- National Parks (NPs); and
- Registered Parks and Gardens (RPGs).

72. The onshore infrastructure of the project lies outside land subject to any international, national or regional landscape designation intended to protect landscape quality as shown in Figure 29.2. This was a key decision in the site selection process for the project.

29.6.3.1 AONBs

73. AONBs are designated by Natural England and collectively represented by the National Association for AONBs. In general, they remain the responsibility of the Local Authority by means of a special committee and a dedicated AONB Officer. Their purpose is to conserve and enhance the natural beauty of the landscape. The National Planning Policy Framework (2012) states that AONBs have the same status

as NPs in the planning system when it comes to landscape issues. Management plans set out the key issues and strategy for conservation and enhancement.

74. The Norfolk Coast AONB is the only AONB in the study area, lying approximately 6.8km north-west of the closest edge of the landfall and approximately 1.7km south of the closest edge of the onshore cable route.
75. Site reconnaissance has shown that the potential impact of the project on the AONB would be largely limited by a combination of distance, low landform and intervening built form and vegetation. There is very little possibility that the landfall or onshore cable route would be visible from the AONB, especially when considering the limited vertical scale of these developments. The impact of the project on the Norfolk Coast AONB is therefore not assessed in detail in this LVIA as there would be no potential for significant effects to arise.

29.6.3.2 National Parks

76. NPs are managed by National Park Authorities whose role is to carry out the two main objectives:
 - *“To conserve and enhance the natural beauty, wildlife and cultural heritage of the area; and*
 - *To promote opportunities for the understanding and enjoyment of the parks’ special qualities by the public.”*
77. The only NP in the study area is The Broads, which lies approximately 4.2km south-west of the closest edge of the landfall and approximately 1.2km south of the closest edge of the onshore cable route. The Broads differs from the other NPs in that it was set up by the separately constituted Broads Authority enabled by a special act of Parliament. It differs most notably from the other NPs in that its primary statutory objective is to deal with navigation of the waterways rather than conservation of the landscape.
78. Site reconnaissance has shown that, despite the proximity of the project to the Broads NP, the extent of mature woodland that separates the two sites notably reduces the potential for visibility. There is therefore, no possibility that the landfall or onshore cable route would be visible from The Broads NP, especially when considering the vertical scale of these developments relative to the scale of intervening vegetation, especially the mature woodland that encloses this northern tip of the NP. The impact of the project on the Broads NP is therefore not assessed in detail in this LVIA as there would be no potential for significant effects to arise.

29.6.3.3 Register of Parks and Gardens

79. The Register of Parks and Gardens presents an inventory, maintained by HE, of all the protected sites in England and Wales. These sites are considered to be of

national significance, and most are associated with stately homes, although many parks or cemeteries are also listed.

80. There is one RPG close to the study area associated with the landfall and none in the study area associated with the onshore project substation. Happisburgh Manor is located approximately 500m north of the closest edge of the landfall.
81. The proximity of Happisburgh Manor to the landfall sites means that there is the potential for significant effects to arise, despite the relatively enclosed nature of the gardens and the separation between the two by intervening development. The potential impacts on Happisburgh Manor gardens are considered in section 29.7.
82. The onshore cable route does not cross any international, national or regional landscape designations. Parts of Blickling Hall RPG to the north west of Aylsham, and Salle Park to the north east of Reepham, lie within the 1,045m wide study area, although the onshore cable route itself does not extend into these designated landscapes. While mature policy woodland means that a significant effect is unlikely in respect of both RPGs, detailed assessments of the construction impacts on both are included in the LVIA on account of the national importance of these designed landscapes.

29.6.3.4 Summary of designations

83. This section has reviewed landscape designations within the study areas of the landfall, onshore project substation, onshore cable route, National Grid substation extension and overhead line modification in order to understand how these special landscapes are protected and valued and how susceptible they would be to the potential impacts of the project. The landscape designations with potential to be significantly affected by the project include RPGs at Happisburgh Manor Gardens, Salle Park and Blickling Hall.
84. This information informs the assessment of potential impacts on these landscape designations presented in section 29.7. The assessment considers the magnitude of change that would arise as a result of the project and whether the resultant effect would be significant or not significant.

29.6.4 Viewpoints and Principal Visual Receptors

85. The study areas associated with the landfall, onshore cable route, onshore project substation, and National Grid substation extension, span a broad cross section of Norfolk County from the coastal landscapes in the east, to the valley and plateau landscapes in the west. The common feature throughout this broad cross-section is the extent of the cultivated landscape, whereby almost all these landscapes are characterised by arable farmland. Settlements and roads are an integral feature of these farmed landscapes; settlements being typically small in scale and rural in

character, occurring as hamlets, villages and towns, dispersed throughout the landscape; and roads being typically narrow, winding and enclosed by hedgerows or embankments. Public Rights of Way (PRoWs) and other footpaths allow access into many of the rural landscapes, and along the coastline, adding notably to the experience people have of their local landscapes.

86. Principal visual receptors are shown along the length of the onshore cable route, from the landfall to the onshore project substation and National Grid substation extension, on Figure 29.3.

29.6.4.1 Settlements

87. The coastal settlements are distinct from the landward settlements owing to their typically linear form along the coast and greater extent of modern development, often comprising chalets and caravan parks. Across the landward area, settlement patterns are typically nucleated with an inward-looking character, and growth commonly enveloping the historic core. Some settlements have grown into towns, such as North Walsham and Aylsham, although most have remained as villages. The rural areas are characterised by small hamlets, clusters of dwellings and isolated farmsteads.
88. Happisburgh lies to the north of the landfall and Eccles-on-Sea to the south. The southern residential streets of Happisburgh and northern residential streets of Eccles-on-Sea lie closest to the landfall, making residents of these parts potentially susceptible to the associated effects during construction.
89. Ivy Todd is a hamlet set to the south of the onshore project substation. There is some visibility towards the onshore project substation from the rear elevations of some properties and gardens on the northern edge of the hamlet, making residents of these parts potentially susceptible to the associated effects during construction, operation and decommissioning.
90. Necton is a village located to the south-west of the onshore project substation and west of the National Grid substation extension. Modern development has built up around the historic core marked by All Saints Church, which forms an important landmark feature across the surrounding rural landscapes. The project would be largely screened from the village by intervening landform and buildings, with only residents on the north-east edge being potentially susceptible to the associated effects during construction and operation.
91. Settlements occurring within the 1.045km onshore cable route study area include: Happisburgh, Ridlington, Edingthorpe Green, North Walsham and Banningham within North Norfolk; Aylsham, Silvergate, Southgate, Cawston and Reepham within

Broadlands District; and Swanton Morley, Dereham and Necton within Breckland District.

29.6.4.2 Roads and railways

92. The A47 is the main trunk road between Peterborough and Great Yarmouth, via Norwich. The section of relevance to the assessment of the onshore project substation site lies between Little Fransham in the east and Necton in the west. The project includes a new junction from the A47 to provide access to the onshore project substation and National Grid substation extension. This is located close to the Top Farm access and includes a slip road to allow east-bound vehicles to turn into the new access road. This will require minimal removal and replacement of certain areas of the Dudgeon substation mitigation planting as shown in Figure 29.11a.
93. A and B class roads within the onshore cable route study area include, the B1159, B1145 (North Walsham) and A149 within North Norfolk; the B1145 (near Aylsham); B1145 (near Cawston and Reepham), A140 and B1149 within Broadlands District; and A1067, B1146 and A47 within Breckland District.
94. The level of disruption in terms of visual impact would be notably reduced due to the use of trenchless crossings on the A47, A140, A149, B1145 and Old Hall Road. This approach forms an important part of the embedded mitigation for the project and helps reduce the potential effects on landscape and visual receptors. The use of trenchless crossing would mean that roadside vegetation would remain intact and the trenchless drilling compounds and presence and activity of plant, materials, offices and welfare facilities would often be fully or partly screened by adjacent roadside vegetation.
95. Of the other roads which would be intersected by the onshore cable route, Dereham Road, B1146 (north of Dereham), B1147 (south of Swanton Morley), Lime Kiln Road, A1067 (west of Sparham), B1145 (west of Cawston) and Heydon Road, have the potential for significant visual effects. The others have restricted visibility due to successive layers of intervening roadside or field boundary vegetation within the intervening landscape or where views from the road are orientated away from the onshore cable route limiting the potential for significant effects to occur.

29.6.4.3 PRowS and other footpaths

96. The Norfolk Coastal Path is a long-distance footpath that follows the coastline of Norfolk over 62.5 miles between Hunstanton and Sea Palling. It is designated as a National Trail, making it of national importance. The section of path between Happisburgh and Eccles on Sea that has potential to be affected by the project owing to its proximity to the landfall.

97. Long distance recreational routes within the onshore cable route study area include: Sea Palling to Weybourne National Trail and the Norfolk Coast Cycleway within North Norfolk; Aylsham to Felbrigg Hall Regional Cycle Route 33, Marriott's Way, and National Cycle Route 1 within Broadlands District; and National Cycle Route 13 within Breckland District. There are also a series of shorter circular recreational routes within the cable route study area including Paston's Way within North Norfolk; Weavers Way within Broadlands; and Wensum Way within Breckland.
98. In the area around the onshore project substation there is very limited access into the landscape. The only route of relevance to the assessment is Lodge Lane, a track leading north to Lodge Farm from the hamlet of Ivy Todd.

29.6.4.4 Summary of principal visual receptors

99. The effects on the visual receptors which occur in the study areas of the landfall, onshore cable route, onshore project substation and National Grid substation extension are assessed in section 29.7. The assessment considers the sensitivity and the magnitude of change that would arise as a result of the project and whether the resultant effect would be significant or not significant. Representative viewpoints have been used in the assessment of the onshore project substation and National Grid substation extension with associated photographs and visualisations presented in Figures 29.13 to 29.24.

29.6.5 Anticipated Trends in Baseline Conditions

100. The baseline character of the landscapes associated with the landfall, onshore cable route, onshore project substation, National Grid substation extension and overhead line modification is likely to change in the future as a result of the effects of climate change, land use policy, environmental improvements and development pressures.
101. Norfolk County Council has produced a summary of the County's climate change strategy, which states '*Climate change is one of the greatest challenges facing Norfolk today. As a low-lying coastal county with a growing population, Norfolk is particularly vulnerable. Higher sea levels, heatwaves, droughts and storms are all more likely as global temperatures rise.*' In respect of the study areas associated with the project, higher sea levels will affect the coast between Happisburgh and Eccles-on-Sea, while droughts and flooding will affect agricultural land, woodlands and other semi-natural landscapes, with vegetation being affected both in dry periods and wet periods, with long-term water-logging in low-lying parts presenting a particular problem.
102. Subsidies associated with the European Union Common Agricultural Policy will be retained during a transitional period of three to five years after Brexit, beyond which new subsidies proposed by the current Government will reward farmers who plant

woodland and wildflower meadows on their land. This will potentially change the character of the landscape by introducing a greater extent of rural woodland and establishing a greater diversity of habitat.

103. Table 29.13 in section 29.8 includes Planning Applications for future developments that are potentially of relevance to the CIA of the project. These give an indication of the likely trends to be experienced in terms of development pressures across the study areas. Residential development would be likely to remain relatively small scale and infilling within or expanding edges of existing settlements. Improvements along the A47 would potentially give rise to increased traffic flows through the area, with possibly a boost to local businesses and industry. Onshore wind farms are unlikely to be developed owing to the removal of government subsidies and the lack of public support.

29.7 Potential Impacts

104. The construction, operation and decommissioning of the components of the project have the potential to affect the physical elements of the site, as well as the landscape character and visual amenity of the study areas around the site. There is also the potential for cumulative impacts in relation to other large-scale infrastructure projects. A list of other relevant projects to be considered within the cumulative impact assessment has been provided in Table 29.13.
105. The potential impacts of the landfall, onshore cable route, onshore project substation, National Grid substation extension and overhead line modifications have been assessed at the construction and decommissioning stage of the project, while the onshore project substation and National Grid substation extension have also been assessed at the operational phase. This is because the components of the landfall and onshore cable route would be buried underground, with the exception of small scale link boxes, during the operational phase, thus reducing the potential for significant effects to arise. The potential impacts are determined through consideration of a worst case scenario, as presented in
106. Table 29.8, as well as having regard to the mitigation measures embedded in the project as described below.
107. The project description (as presented in full in Chapter 5) has been refined following PEIR. This has enabled the LVIA to make a more focused assessment of potential effects. The decision to use a HVDC electrical solution means a CRS is no longer required and there is a reduction in the maximum number of cable trenches in the onshore cable route, from twelve to four (including trenches for Norfolk Boreas ducts). All the significant effects assessed in PEIR, in relation to the CRS options, would therefore no longer arise and the effects relating to the onshore cable route would be reduced owing to the narrower working width of the trench, which has

been reduced from 100m to 45m, and reduced further to a working width of 20m through hedgerows where crossed perpendicularly by the onshore cable route (with a maximum of 25m where this is not the case). Overall, the HVDC solution will give rise to notably less significant landscape and visual effects.

108. An HVDC onshore project substation was originally assessed as an option in PEIR and therefore this falls within the assessed worst-case scenario. While this assessment has been refined to reflect small scale changes in the project description and improved mitigation measures, the findings remain broadly unchanged. The final design for the HVDC onshore project substation will be defined post-consent, however this will be within the parameters set out by the Rochdale Envelope, based on a 250m x 300m footprint, with a maximum building height of 19m, as set out in the Design and Access Statement (document reference 8.3).

29.7.1 Embedded Mitigation

29.7.1.1 Introduction

109. Norfolk Vanguard Limited has committed to a number of techniques, engineering designs and modifications inherent as part of the project, during the pre-application phase, in order to avoid a number of impacts or reduce impacts as far as possible. Embedding mitigation into the project design is a type of primary mitigation and is an inherent aspect of the EIA process.
110. A range of different information sources has been considered as part of embedding mitigation into the design of the project (for further details see Chapter 5 Project Description, Chapter 4 Site Selection and Assessment of Alternatives and the Consultation Report (document reference 5.1)) including engineering requirements, feedback from community and landowners, ongoing discussions with stakeholders and regulators, commercial considerations and environmental best practice.
111. The following section outlines the key embedded mitigation relevant for this assessment. These measures are presented in Table 29.6.
112. Where embedded mitigation measures have been developed into the design of the project with specific regard to landscape and visual impacts, these are described in Table 29.7.

Table 29.6 Embedded mitigation

Parameter	Mitigation measures embedded into the project design	Notes
Strategic approach to delivering Norfolk Vanguard and Norfolk Boreas	Subject to both Norfolk Vanguard and Norfolk Boreas receiving development consent and progressing to construction, onshore ducts will be installed for both projects at the same time, as part of the Norfolk Vanguard construction works. This would allow the	The strategic approach to delivering Norfolk Vanguard and Norfolk Boreas has been a consideration from the

Parameter	Mitigation measures embedded into the project design	Notes
	<p>main civil works for the cable route to be completed in one construction period and in advance of cable delivery, preventing the requirement to reopen the land in order to minimise disruption. Onshore cables would then be pulled through the pre-installed ducts in a phased approach at later stages.</p> <p>In accordance with the Horlock Rules, the co-location of Norfolk Vanguard and Norfolk Boreas onshore project substations will keep these developments contained within a localised area and, in so doing, will contain the extent of potential impacts.</p>	outset.
Commitment to HVDC technology	<p>Commitment to HVDC technology minimises environmental impacts through the following design considerations;</p> <ul style="list-style-type: none"> • HVDC requires fewer cables than the HVAC solution. During the duct installation phase this reduces the cable route working width (for Norfolk Vanguard and Norfolk Boreas combined) to 45m from the previously identified worst case of 100m. As a result, the overall footprint of the onshore cable route required for the duct installation phase is reduced from approx. 600ha to 270ha; • The width of permanent cable easement is also reduced from 54m to 20m; • Removes the requirement for a CRS; • Reduces the maximum duration of the cable pull phase from three years down to two years; • Reduces the total number of jointing bays for Norfolk Vanguard from 450 to 150; and • Reduces the number of drills needed at trenchless crossings (including landfall). 	Norfolk Vanguard Limited has reviewed consultation received and in light of the feedback, has made a number of decisions in relation to the project design. One of these decisions is to deploy HVDC technology as the export system.
Site Selection	<p>The project has undergone an extensive site selection process which has involved incorporating environmental considerations in collaboration with the engineering design requirements. Considerations include (but are not limited to) adhering to the Horlock Rules for onshore project substations and National Grid infrastructure, a preference for the shortest route length (where practical) and developing construction methodologies to minimise potential impacts.</p> <p>Key design principles from the outset were followed (wherever practical) and further refined during the EIA process, including;</p> <ul style="list-style-type: none"> • Avoiding proximity to residential dwellings; • Avoiding proximity to historic buildings; • Avoiding designated sites; • Minimising impacts to local residents in relation 	Constraints mapping and sensitive site selection to avoid a number of impacts, or to reduce impacts as far as possible, is a type of primary mitigation and is an inherent aspect of the EIA process. Norfolk Vanguard Limited has reviewed consultation received to inform the site selection process (including local communities, landowners and regulators) and in response to feedback, has made a number of decisions in relation to the

Parameter	Mitigation measures embedded into the project design	Notes
	<p>to access to services and road usage, including footpath closures;</p> <ul style="list-style-type: none"> • Utilising open agricultural land, therefore reducing road carriageway works; • Minimising requirement for complex crossing arrangements, e.g. road, river and rail crossings; • Avoiding areas of important habitat, trees, ponds and agricultural ditches; • Installing cables in flat terrain maintaining a straight route where possible for ease of pulling cables through ducts; • Avoiding other services (e.g. gas pipelines) but aiming to cross at close to right angles where crossings are required; • Minimising the number of hedgerow crossings, utilising existing gaps in field boundaries; • Avoiding rendering parcels of agricultural land inaccessible; and • Utilising and upgrading existing accesses where possible to avoid impacting undisturbed ground. 	<p>siting of project infrastructure. The site selection process is set out in Chapter 4 Site Selection and Assessment of Alternatives.</p>
Duct Installation Strategy	<p>The onshore cable duct installation strategy is proposed to be conducted in a sectionalised approach in order to minimise impacts. Construction teams would work on a short length (approximately 150m section) and once the cable ducts have been installed, the section would be back filled and the top soil replaced before moving onto the next section. This would minimise the amount of land being worked on at any one time and would also minimise the duration of works on any given section of the route.</p>	<p>This has been a project commitment from the outset in response to lessons learnt on other similar NSIPs. Chapter 5 Project Description provides a detailed description of the process.</p>
Long HDD at landfall	<p>Use of long HDD at landfall to avoid restrictions or closures to Happisburgh beach and retain open access to the beach during construction. Norfolk Vanguard Limited have also agreed to not use the beach car park at Happisburgh South.</p>	<p>Norfolk Vanguard Limited has reviewed consultation received and in response to feedback, has made a number of decisions in relation to the project design. One of those decisions is to use long HDD at landfall.</p>
Trenchless Crossings	<p>Commitment to trenchless crossing techniques to minimise impacts to the following specific features;</p> <ul style="list-style-type: none"> • Wendling Carr County Wildlife Site; • Little Wood County Wildlife Site; • Land South of Dillington Carr County Wildlife Site; • Kerdiston proposed County Wildlife Site; • Marriott's Way County Wildlife Site / Public Right 	<p>A commitment to a number of trenchless crossings at certain sensitive locations was identified at the outset. However, Norfolk Vanguard Limited has</p>

Parameter	Mitigation measures embedded into the project design	Notes
	<p>of Way (PRoW);</p> <ul style="list-style-type: none"> • Paston Way and Knapton Cutting County Wildlife Site; • Norfolk Coast Path; • Witton Hall Plantation along Old Hall Road; • King's Beck; • River Wensum; • River Bure; • Wendling Beck; • Wendling Carr; • North Walsham and Dilham Canal; • Network Rail line at North Walsham that runs from Norwich to Cromer; • Mid-Norfolk Railway line at Dereham that runs from Wymondham to North Elmham; and • Trunk Roads including A47, A140, A149. 	<p>committed to certain additional trenchless crossings as a direct response to stakeholder requests.</p>

Table 29.7 Embedded mitigation for landscape and visual impact assessment

Parameter	Mitigation measures for landscape and visual	Notes
No overhead lines	<p>The decision to use underground cable systems for the onshore cable route over the 60km route between the landfall and electrical connection point, avoids the requirement to construct new overhead lines. The mitigation embedded in this approach will lead to notably reduced impacts on landscape and visual receptors during the construction phase and minimal impacts during the operational phase. It also notably reduces the potential for the onshore cable route to contribute to significant cumulative effects. The construction works will be notably smaller scale than those required to install new overhead lines and post-construction, the onshore cable route will have a negligible impact on landscape and visual receptors as the components will be buried under ground, with the exception of the small scale and intermittent link boxes.</p>	n/a
Strategic landscape mitigation	<p>Mitigation measures associated with the onshore project substation, National Grid substation extension and A47 access form part of a strategic approach to enhancing landscape character and bio-diversity in the local area. Figure 29.12 shows how mitigation planting will contribute to the wider landscape structure of the area and help consolidate green corridors for wildlife.</p> <p>Mitigation planting for the onshore project substation is shown in Figure 29.9a. This has been designed to screen the onshore project substation. Details of the mitigation planting are presented in section 29.7.1 and OLEMS (document reference 8.7).</p> <p>Mitigation planting for the National Grid substation extension is shown in Figure 29.10b. This has been designed to screen the National Grid substation extension in views from Necton. Details of the mitigation planting are presented in section 29.7.1 and OLEMS (document reference 8.7).</p>	See section 29.7.5 to 29.7.7.

Parameter	Mitigation measures for landscape and visual	Notes
Landfall site selection	<p>The selection of the landfall site at Happisburgh South followed a number of key design principles where practical, the following being relevant to LVIA;</p> <ul style="list-style-type: none"> • To avoid the Norfolk Coast AONB to the north and The Broads NP to the south; • To avoid populated areas as far as possible; and • To avoid areas of high amenity value. <p>The mitigation is embedded in site selection and removes impacts from the landfall on the nationally important landscape designations to the north and south, and which is set back sufficiently from the coastal edge and adjacent residential areas.</p> <p>The location of the transition pits are suitably set back from the coastal cliffs and will reduce visual impacts along the coastline.</p> <p>The location of the transition pits, buried to ground or just below ground level, will ensure landscape and visual effects will only occur during the construction phase and not the operational phase.</p>	See section 29.7.5 to 29.7.7.
Onshore cable route site selection	<p>The site selection of the onshore cable route has followed a number of key design principles, where practical, the following being relevant to LVIA;</p> <ul style="list-style-type: none"> • Wherever possible to locate the onshore cable route through open agricultural land; • To avoid landscape designations including RPGs; • To avoid areas of woodland and trees; • To minimise the number of hedgerow crossings and utilise existing gaps in field boundaries if possible; and • To avoid proximity to residential dwellings and settlements. <p>The mitigation is embedded in the site selection and removes impacts on landscape designations, County Wildlife Sites or woodland, and minimises the effects on hedgerows.</p>	See section 29.7.5 to 29.7.7.
Onshore project substation site selection	<p>National Grid's Guidelines on Substation Siting and Design (The Horlock Rules) have been taken into consideration during the site selection process. Those relevant to the LVIA include the following;</p> <ul style="list-style-type: none"> • To avoid landscape designations including National Parks and AONBs; • To protect areas of local amenity value including ancient woodland and historic hedgerows; and • To take advantage of screening provided by landform and existing features; <p>The selected site avoids all international, national, county and local landscape designations. It does not affect any ancient woodland or historic hedgerows and mitigation measures ensure hedgerow loss which would occur is compensated for in new planting around the onshore project substation. The site benefits from existing natural screening provided by the extensive Great Wood to the east, Necton Wood to the north and a series of hedgerows surrounding the site. These landscape features provide screening from the north and east and create a wooded backdrop in views from other</p>	See section 29.7.5 to 29.7.7.

Parameter	Mitigation measures for landscape and visual	Notes
	directions, and in so doing, contribute to the mitigation of landscape and visual effects.	
National grid substation extension site selection	The location of Norfolk Vanguard and Norfolk Boreas and National Grid substation extensions adjacent to the existing Necton National Grid substation will keep these developments contained within a localised area and, in so doing, will contain the extent of the landscape and visual effects.	See section 29.7.5 to 29.7.7.
Hedgerows crossings	<p>Through the selection of a HVDC electrical solution, this has further reduced the maximum width of hedgerow gaps that are required. The maximum size of the hedgerow gap created during the two-year duct installation phase is 20m to 25m, thus reducing the amount of hedgerow removed during construction by over 50% compared to a HVAC solution. These reduced widths will reduce the influence of the onshore cable route construction on landscape and visual receptors and reduce the area of hedgerows to be removed.</p> <p>This width assumes that the cable route bisects each hedgerow in a perpendicular fashion. In reality, some hedgerows will be crossed at an angle, therefore increasing the maximum width of the gap required up to a possible 25m. Where this is the case for a particular receptor, it is noted within this report.</p> <p>Where hedgerow gaps are required beyond the two-year duct installation phase (i.e. for the duration of the subsequent two-year cable pull phase), the number of gaps required will be minimised as far as possible and the width will be no wider than 6m. This information is presented in section 9.2 in the OLEMS (document reference 8.7).</p>	n/a
Lighting	The onshore project substation has been designed so that it does not require permanent lighting.	n/a

29.7.1.2 Site Selection Process

113. The site selection process has involved considerable input from the LVIA in order to provide guidance and advice on the potential sites assessed for the landfall and onshore project substation sites. Site selection can notably reduce the potential for significant effects to arise, for example, by locating infrastructure in areas where there are few close-range visual receptors or where the baseline landscape offers natural screening.
114. The selection process has given due consideration to the following key criteria:

- The influence of the surrounding landform on the visibility of the site i.e. whether it is exposed or enclosed in the local and wider landscape;
 - The ability of the site landform to accommodate a large-scale level platform and associated earthworks that can be integrated within surrounding landform;
 - The influence of existing mature vegetation on the visibility of the site i.e. whether it fully or partly screens the site within the local and wider area;
 - The potential opportunities to use mitigation planting and earthworks to reduce potential visual effects;
 - The sensitivity of surrounding landscape and visual receptors to the potential impacts of the proposed project, especially designated landscapes and residential receptors; and
 - The avoidance of sensitive landscape elements along the onshore cable route, for example woodlands and mature trees.
115. As assessed in the Norfolk Vanguard PEIR, the CRS would have given rise to localised significant effects on landscape and visual receptors. Although the height of the development would have been limited to a maximum of 8m, the footprint would have covered an area of 73m x 135m and 31m x 18m which would have formed a large scale development within this rural, coastal area. The removal of this onshore component from the project eliminates all significant effects associated with the construction and operational phases of the CRS that would otherwise have impacted on local landscape and visual receptors.

29.7.1.3 Landscape Mitigation

116. The onshore project substation site benefits from some substantial existing hedgerows and woodland blocks within the local area. These would provide mitigation of landscape and visual effects from the outset and will be infilled, where necessary, during the early phases of the proposed project to ensure robust screening. The extent of mitigation planting incorporated into the design is presented on Figures 29.9a and 29.10b and mostly comprises indigenous woodland species and would be located around the onshore project substation and along the southern edge of the National Grid substation extension. Owing to the dimensions of the onshore project substation site, the National Grid substation extension and the associated mobilisation areas, construction activities would be required to level existing contours. The earthworks required for the cut and fill to create the level platform would produce surplus soil which would be used to form subtle earthwork bunds of up to 2m along the western side of the onshore project substation. This would help to give an incremental increase to the overall height of screening along this sensitive boundary which is not constrained by planting restrictions associated with underground cables.

117. The mitigation planting would be designed to comprise a mix of faster growing ‘nurse’ species and slower growing ‘core’ species. The core species would comprise a mix of preferred native, canopy species that would outlive the nurse species and characterise the woodland structure over the longer term. It is anticipated that the growth rate of these species would be on average 250mm per annum. The nurse species would be faster growing and shorter-lived, providing shelter to bring on the canopy species. The mix would contain nurse species such as alder, birch, and pine, with average growth rates of 350mm per annum and core species such as oak, beech and horse chestnut, with average growth rates of 250mm per annum. It is anticipated that 5m to 7m growth would take 20 years and the nurse species would have reached approximately 7.25m to 9.75m (assuming planting height of 1m) after 25 years. The nurse species would be sufficiently fast growing to provide substantial screening of the onshore project substation after 20 years.
118. The construction of the project would commence in 2020 at the earliest. In locations where it is possible to achieve advanced planting, this would be implemented at the start of the construction phase, anticipated in 2020. This would mean these areas would already have had approximately three years of growth prior to completion of construction and commencement of operation. This equates to an additional growth of approximately 1.05m in height on top of a base height of approximately 0.75m (for the faster growing nurse species). The heights after 20 years would therefore be approximately 6.75m and 9.05m respectively and after 30 years 9.25m and 12.55m.
119. Mitigation measures are described in more detail in the OLEMS (document reference 8.7), with regard to the re-establishment of hedgerows and planting of mitigation landscaping. Mitigation measures will be designed in detail post-consent as part of the discharge of consent conditions.
120. The mitigation measures have taken into account the ‘Statements of Environmental Opportunity’ (SEO’s) as set out in Natural England’s ‘National Character Area Profiles’. As the two largest scale components of the project (the onshore project substation and the National Grid substation extension) are located in the Mid Norfolk NCA, this is where mitigation measures other than replanting hedgerows would occur. The SEOs for this NCA are, therefore, of particular relevance to the mitigation planting and are summarised below.
- *‘SEO1: Work with the local farming community to safeguard future food production, while conserving and enhancing the traditional rural character, long views and strong sense of tranquillity in this area of long settled, ancient countryside. Manage and enhance farmland habitats- including hedgerows and woodland, field margins and pastoral river corridors – to enhance the area for farmland species (including pollinators), improve water quality and availability in*

the rivers and aquifer, manage soil erosion and quality and address the impacts of climate change.'

- *'SEO2: Maintain, enhance and restore priority habitats including woodlands, areas of remnant heathland, and the nationally and internationally important Norfolk Valley Fens and chalk river systems (including the River Wensum), and seek opportunities to connect fragmented sites, improving the area for biodiversity, geodiversity and recreation, and enhancing landscape character and resilience to climate change.'*
- *'SEO3: Encourage a sympathetic approach to development that maintains traditional Norfolk character and improves sustainable recreational use, while protecting historic assets, geodiversity and biodiversity.'*

121. The mitigation plans respond to these objectives through their inclusion of substantial areas of new woodland, species rich grassland and hedgerows, the arrangement of these areas to connect internally on site and connect externally with existing woodlands, grasslands and hedgerows in the surrounding landscape, and the contribution they will make through their design to the enhancement of the local landscape character.

29.7.2 Monitoring

122. Post-consent, the final detailed design of the project and the development of the Landscape Management Scheme (DCO requirements 18 and 19) in accordance with the OLEMS (document reference 8.7) will refine the worst-case impacts assessed in this EIA. It is recognised that monitoring is an important element in the management and verification of the actual project impacts. The requirement for and appropriate design and scope of monitoring will be agreed with the relevant stakeholders and included within the LMP (DCO requirements 18 and 19) commitments prior to construction works commencing.

29.7.3 Worst Case

123. The 'worst case scenario' (WCS) includes the parameters for the component parts of the project which would result in the greatest potential impacts upon the landscape and visual receptors described in section 29.6. Chapter 5 Project Description describes the component parts of the project.
124. The DCO application includes construction works for Norfolk Boreas cable ducts for the onshore cable route. As the addition of these works may contribute to a greater potential impact, then their parameters, together with those of Norfolk Vanguard, must also be considered in defining the WCS.
125. [Table 29.8](#) presents the WCS with regard to LVIA considerations.

Table 29.8 Worst case assumptions

Worst case assumptions			
Parameter	Worst case criteria	Worst case definition	Notes
Landfall			
Construction	Transition pit maximum footprint	10m x 15m x 5m deep (2 pits in total)	Transition pits constructed for Norfolk Vanguard only.
	Maximum drill length	1,000m	
	Compound and total footprint	6,000m ² (2 compounds of 60 x 50m each including transition pit)	Compounds secured by 2.4m high fence and surfaced in permeable gravel aggregate.
	Temporary access track width	6m	Track surfaced in either bog-mats, geotextiles or hardstanding. Time includes set up and access road works.
	Maximum total landfall construction time	20 weeks based on 7am-7pm normal working hours	
HDD compounds	Maximum number and maximum land take for temporary HDD compounds	Assumes 2 at 6,000m ² (50m x 60m) to support parallel drill rigs	Landfall only.
Onshore cable route			
Construction	Construction method	Open cut trenching	Norfolk Vanguard and Norfolk Boreas - duct installation. Norfolk Vanguard only – cable pull through.
	Maximum working width and length	45m and 60km	Land and hedgerows reinstated post construction. Hedgetrees and trees not permitted to be replanted over cable easements with additional 6-10m either side.
	Gaps at hedgerow / other crossing points	20m	The 20m gap at hedgerows is indicative, depending on the angle of crossing. This width assumes that the onshore cable route bisects each hedgerow in a perpendicular fashion. In reality, some hedgerows will be crossed at an angle, therefore increasing the maximum width of the gap required up to a possible 25m in some locations.
	Running track width and length	6m and 60km	
	Cable trench width and depth	1m per trench, 1.5m deep	
	Works hours	12 hour working day, 5-7 days a week for 2 years	

Worst case assumptions			
Parameter	Worst case criteria	Worst case definition	Notes
Permanent joint pits	Maximum number and required dimensions	Assume 150 at 90m ² and 2m deep each (2 pits per location – one for each circuit – therefore 75 joint pit locations)	Norfolk Vanguard only, spaced approximately one per circuit per 800m cable.
Mobilisation areas	Maximum number and required dimensions	Assumes 14 at 10,000m ² (100 x 100m)	These are required for duct construction and pull through.
Trenchless launch and reception sites	Maximum number and maximum land take for trenchless launch and reception sites	Assumes 17 pairs at 12,500m ² (7,500m ² and 5,000m ² respectively)	These are required for trenchless crossing (e.g. HDD) drilling and pull through.
Decommissioning		Joint pits and ducts left in situ	Where cables are in pre-installed ducts, cables may be extracted once de-energised.
Onshore project substation			
Construction	<p>Maximum land take for temporary construction compound</p> <p>Access track width</p> <p>Maximum height</p> <p>Appearance of building</p> <p>Works hours and maximum duration</p> <p>Access</p>	<p>20,000m² (200m x 100m)</p> <p>6m</p> <p>19m building with 25m lightning protection masts, fences 3.4m high</p> <p>Steel framed with cladding and palisade fencing</p> <p>12 hour working day, 5 to 7 days a week for 30 months</p> <p>From A47</p>	<p>Norfolk Vanguard only</p> <p>Land and hedgerows reinstated post construction. Hedgetrees and trees not permitted to be replanted over cable easements with additional 6-10m either side.</p> <p>For HVDC, there would be: 2 x converter buildings, 2 x outdoor HVAC compounds, control building, access roads. Converter buildings would be up to 19m in height, all other components would be below 10m in height. Construction of converter buildings would require the use of cranes.</p> <p>Road widening associated with A47 access junction would require removal of existing road-side vegetation over an approximate 300m length. Indicative construction window 24 months.</p>
Operation	<p>Maximum land take for permanent footprint</p> <p>Access</p>	<p>75,000m² (250m x 300m)</p> <p>1 visit per week, site lighting required during maintenance visits</p>	
Decommissioning	No decision has been made regarding the final decommissioning policy for the onshore project substation, as it is recognised that industry best practice, rules and legislation change over time. However, the onshore project equipment will likely be removed and reused or recycled. The detail and scope of the decommissioning works will be		

Worst case assumptions			
Parameter	Worst case criteria	Worst case definition	Notes
	determined by the relevant legislation and guidance at the time of decommissioning and agreed with the regulator. A decommissioning plan will be provided. As such, for the purposes of a worst-case scenario, impacts as for the construction phase are assumed.		
National Grid substation extension and overhead line modification			
Construction	Maximum land take for temporary works area – substation extension	67,500m ²	Norfolk Vanguard only. Indicative construction window 24 months.
	Maximum land take for temporary works area – overhead line	174,264m ²	
	Maximum height of temporary towers	45m	
	Works hours and duration	12 hour working day, 5 to 7 days a week for 30 months	
Operation	Maximum land take for substation extension permanent footprint	49,300m ²	Includes existing Necton National Grid substation area. Busbar extensions only for Norfolk Vanguard and not Norfolk Boreas.
	Substation extension tallest structure	15m (outdoor AIS busbar and landing gantries)	
	Extension to outdoor busbar	200m length, 7 AIS bays installed	
	Maximum land take for overhead line permanent footprint	9,250m ²	
	Overhead line tallest structure	50m (new permanent junction tower)	
	Access	1 visit per month, site lighting required during maintenance visits	

29.7.4 Assessment Scenarios

126. Chapter 5 Project Description outlines the scenarios to be assessed in relation to the phasing of the works. The phasing of the construction works is as follows:

- The offshore project may be constructed as one or two phases and elements of the onshore construction would also be phased to reflect this;

- Pre-construction works (e.g. hedgerow clearance) for the onshore cable route to be conducted over a two year period, prior to duct installation;
- Cable ducts would be installed in one operation over two years, regardless of the offshore strategy;
- Cable pull through would be done in either one or two phases;
- The onshore project substation ground preparation and enabling works would be done in one phase, anticipated to take two years for pre-construction works and two years for primary works;
- The required electrical infrastructure and plant within the onshore project substation would then be installed as required for each phase if the one or two phase options were adopted for offshore construction; and
- Indicative total construction window for the one phase scenario is anticipated to be five years, and six years for the two phase scenario.

29.7.5 Potential Impacts during Construction

127. The assessment firstly considers the potential impact of the project during the construction phase, considering the specific impacts associated with the landfall, onshore cable route, onshore project substation and National Grid substation extension (including the overhead line modifications).
128. [Table 29.8](#) sets out the detailed worst-case scenario parameters of the project description. Presented below, in respect of each of the four main components of the project, is an assessment of their potential impact on landscape elements, landscape character and visual amenity.

29.7.5.1 Potential impacts during construction - landfall

129. The landfall will be located at Happisburgh South, on the section of coast between the settlements of Happisburgh to the north and Eccles-on-Sea to the south. The commitment to long HDD means that the majority of the construction works would be offset, inland from the cliffs. The impact of the landfall during the construction phase would relate principally to the following features of the construction process:
- The effect on the landscape element of agricultural land owing to the 2 x 3,000m² (60m x 50m) surfaced landfall compounds, the 2 x 150m² (15m x 10m) transition pits (one in relation to each compound), the 45m wide cable easement heading landward and the temporary running track connecting to Whimpwell Street.
 - The effect on landscape character and visual amenity owing to the presence of the temporary, surfaced and fenced landfall compound, security and task lighting and the presence of the drilling rig, ducting materials and welfare facilities.

- The effect on landscape character and visual amenity owing to the activity associated with the excavation and construction of the two transition pits, installation of the ducts, pulling through of cables and construction of temporary running track.
 - The effect on the visual amenity of walkers on the coastal path owing to the concentration of construction vessels close to the shore and construction works onshore.
 - The duration of an indicative 20 week construction period.
 - The reinstatement of ground at the landfall compound and along the running track at the end of construction.
130. [Table 29.9](#) shows the detail of the assessment for each receptor. In summary, the landfall construction would have a not significant effect on the landscape character of the Bacton to Sea Palling Coastal Plains LCU as a whole, however there would be a short term significant effect in the very localised landscape around the landfall. There would also be a significant effect on the views of walkers on short and localised sections of Norfolk Coastal Path and PRow RB22 and on the views of residents on Lighthouse Lane in the southern extent of Happisburgh. The landfall construction works would be relatively small in scale and this explains the localised extent of the effects. Furthermore, the construction works would last a maximum of 20 weeks, making the effects short term. Reinstatement of the majority of the agricultural land at the end of this period would make the effects largely reversible.

Table 29.9 Potential impacts during construction - landfall

Receptor	Baseline	Sensitivity	Magnitude of Change	Significance of Effect	Duration of Effect
Landfall – Landscape receptors					
Coastal cliffs and beach	The coast between Happisburgh and Eccles-on-Sea is characterised by stratified cliffs rising to between 6 to 10m. The cliffs comprise sands, clays and tills making them soft and prone to erosion. They enclose a predominantly sandy beach with occasional loose rocks and outcrops. Old timber groynes extend out into the sea, built to reduce the further effects of onshore drift.	The sensitivity of the coastal cliffs is high , and the sensitivity of the beach is medium to high . The cliffs are a relatively scarce landscape element and a characterising feature of the coastal landscape. They are weak and prone to erosion and would be difficult to reinstate. As the beach comprises already eroded material it is not as sensitive to the effects of the project.	The magnitude of change would be low . The selection of the Long HDD option for duct installation means that there would be no construction works on the beach and drilling would take place from the entry pit on the landward side beneath the cliff and up to 1,000m to the exit point offshore. The effects on the cliffs would be subterranean and limited to up to three localised drilled holes.	Not significant. The combination of the high sensitivity and the low magnitude of change leads to a not significant effect. There would be no effect on the beach owing to the use of the Long HDD option and effects to the cliffs would be subterranean and localised.	Short term and reversible. 20 week construction period.
Agricultural land	The South Happisburgh landfall comprises arable agricultural land. This is the predominant land cover in the local area and is widespread across the Norfolk landscape. The faint delineations of former field boundaries mark the loss of hedgerow enclosure in this coastal area, where the resultant amalgamation has created a larger field pattern and a predominantly open and exposed landscape. The land is	The sensitivity of the agricultural land is medium to low . This is a modified landscape in which the intensification of farming practices has led to the loss of hedgerow boundaries and small-scale field pattern. These factors detract from the value of this landscape element and reduce its susceptibility to the landfall construction because there is no natural vegetation, the vegetation that is present is cultivated, it has no	The magnitude of change would be medium in those areas where the agricultural land would be stripped, covered or excavated. There would be a concentrated effect where the two temporary mobilisation areas each of 3,000m ² would be located, each containing one transition pit of 150m ² . The compounds would be contained by a 2.4m fence, surfaced in permeable gravel aggregate and containing plant, materials and welfare facilities. A temporary access road with a temporary	Not significant. The combination of the medium to low sensitivity and the medium magnitude of change would lead to a not significant effect. Landfall construction would occur in an agricultural area with disturbed land	Short term and reversible. 20 week construction period.

Receptor	Baseline	Sensitivity	Magnitude of Change	Significance of Effect	Duration of Effect
	intensively managed and there is very little natural vegetation.	scarcity value and can be easily replaced. The agricultural land would be reinstated post construction.	surface would link the construction works with Whimpwell Street. The agricultural land would be temporarily altered through its use for construction purposes. While the area would be sizable, it would form only a small proportion of the wider agricultural land as a resource. The storage and relaying of the topsoil, as far as practicable, would ensure reinstatement returns the agricultural land to its baseline condition and this would reduce the overall magnitude of change.	and no natural vegetation. Long term changes would occur below ground surface with good potential for reinstatement without notably damaging the quality of the agricultural land.	
Coastal Plain LCT: Bacton to Sea Palling LCU	The Bacton to Sea Palling LCU covers an extensive section of the Norfolk coastline and landward interior. The influence of the coast is limited to the narrow coastal strip beyond which visibility of the sea is screened by the undulating landform and enclosure of built form and vegetation. Much of this LCU is characterised by arable farmland, parts of which are enclosed by hedgerows and tree cover, but most of which has lost the small-scale pattern of enclosure through intensification of farming practices. Settlements	The sensitivity of the LCU is medium to high . The value of the LCU is medium – while the coastal edge forms the key feature of this LCU, it is not subject to any landscape designations which would otherwise denote a special value. The loss of hedgerows and amalgamation of fields along the coastal edge has led to the degradation of the historic landscape and character of small scale enclosure. The susceptibility of the LCU is medium to high as the landfall would be located in this LCU, albeit in a part that has been modified through cultivation of arable crops	The magnitude of change would be low to negligible or no effect across most of the LCU and medium to high within the localised part of the LCU in and around the landfall site. In the localised part of the site, the landscape character would be changed by the introduction of the running track and mobilisation area, and the presence and activity of plant associated with the landfall construction works. While much of the landfall construction would be located on the landward side, it would have an influence on the character of the sensitive coastal edge. The effect would be moderated by the modified nature of the baseline landscape, the	Not significant across the majority of the LCU, and significant in the localised area around the landfall. The combination of the medium to high sensitivity and the medium to high magnitude of change would lead to a significant effect, which would occur between the ridge on which Happisburgh	Short term and reversible. Localised significant effects would occur during the 20 week construction period and then reduce to not significant post-construction.

Receptor	Baseline	Sensitivity	Magnitude of Change	Significance of Effect	Duration of Effect
	and roads are typically small scale and rural. Views typically extend across fore to middle ground, depending on the level of landform and hedgerow enclosure.	and the intensification of farming.	medium scale and subterranean location of the construction works and the ease with which effects would be mitigated through reinstatement of the farmland as far as is practicable.	Lighthouse sits in the north and PRow Happisburgh RB22 in the south.	
Happisburgh Manor Designed Landscape	Happisburgh Manor is a Grade II Listed Building set in a designed landscape that is listed in Historic England's 'Register of Parks and Gardens.' Landform slopes from north to south and the manor is situated on an elevated knoll such that it affords views east towards the sea and south across the village and adjacent farmland. The garden has been designed to be enclosed and there are no associations drawn with the surrounding landscape or seascape. To the north of the house there is a woodland garden planted to shelter the garden from coastal winds. A circular wall encloses compartments in a central core around the house, with summer houses integrated into the structure.	<p>The sensitivity of Happisburgh Manor designed landscape is medium to high.</p> <p>The value of the garden is high. The Historic England designation denotes the national importance of the RPG, despite the fact that it is not publicly accessible.</p> <p>The susceptibility of the garden to the landfall construction is medium to low. This is due primarily to the enclosed and introverted nature of the garden. While the manor house has been designed to take advantage of key views, the enclosure of much of the garden by woodland, tree cover, walling and summer houses limits the influence that the surrounding landscape has on its character. Tree planting along the southern boundary limits potential visibility of the landfall construction in this direction.</p>	<p>The magnitude of change on Happisburgh Manor would be low.</p> <p>Visibility of the landfall construction is unlikely owing to the mature tree cover which lines the southern site boundary and the intervening ridge marked by the location of Happisburgh Lighthouse. The landfall construction would be relatively restricted in terms of the vertical scale of plant and the horizontal spread of the compound, ensuring that it would be effectively screened by the intervening tree cover and landform.</p>	<p>Not significant.</p> <p>The combination of the medium to high sensitivity and the low magnitude of change would lead to a not significant effect. The limited possibility of visibility of the landfall construction occurring from the RPG notably limits any influence on its character.</p>	<p>Short term and reversible.</p> <p>20 week construction period.</p>
Landfall – Visual receptors					

Receptor	Baseline	Sensitivity	Magnitude of Change	Significance of Effect	Duration of Effect
Norfolk Coast Path	The Norfolk Coastal Path is a long-distance footpath that follows the coastline of Norfolk. The section of path between Happisburgh and Eccles on Sea has potential to be affected by the proposed project as it is the only section with potential visibility. This section sits on top of the low cliffs and comprises a narrow dirt path. The sandy beach lies below the crumbling cliffs and is characterised by the old timber groynes that extend out into the sea. On the landward side, the rolling landform is at its highest next to Happisburgh and then dips in the middle before rising towards Eccles-on-Sea. The surrounding land cover is arable farmland which extends right up to the cliff edge and with no hedgerow, the fields appear large and exposed.	<p>The sensitivity of walkers on the coastal path is high.</p> <p>The high value of the Coastal Path relates to its national importance as a long-distance route. Although this designation does not relate directly to scenic value, the Coastal Path does enable walkers to experience attractive coastal views.</p> <p>The susceptibility of walkers on the path is medium to high because their attention is typically focused on the seaward side, although they would come within close range of the landfall construction on the landward side. There would be no construction activity on the beach, and vessels associated with the landfall construction would be visible to walkers.</p>	The magnitude of change on the views of walkers would be medium to high within the short section of coastal path south of Happisburgh and north of Eccles-on-Sea, and with no effect across the remainder of the coastal path. The presence of the two temporary mobilisation areas, each containing a transition pit, would create a focal, if localised, feature in this relatively exposed landscape. The rolling landform would help to provide some screening from parts of the path, while from adjacent parts a clear view would be experienced by walkers. Despite some similar features with existing agricultural practices, the concentration and activity of plant on the landward side and concentration and activity of vessels close to the shore on the seaward side, would appear at variance with the rural character and this would add to a notable effect.	Not significant along Norfolk Coast Path, with the exception of the localised section between Happisburgh coastal car park and PRoW Happisburgh RB22 where the effect would be significant . The combination of the high sensitivity and medium to high magnitude of change would lead to a significant effect, albeit from a localised section of the Coastal Path, with the majority remaining unaffected.	Short term and reversible. Localised significant effects would occur during the 20 week construction period and then reduce to not significant post-construction.
Happisburgh	Happisburgh lies to the north of the landfall site. It is a small nucleated village, characterised by two important landmark features, St. Mary's Church in the north of the village and Happisburgh Lighthouse to the	<p>The sensitivity of Happisburgh is medium to high.</p> <p>The value of the village is considered to be high on account of its Conservation Area status which denotes its special architectural and</p>	The magnitude of change on the views of residents would be medium in parts along the southern edge and negligible or no effect across the remainder of the village, where visibility of the landfall construction would be mostly screened by intervening built form, landform and	Not significant for residents of Happisburgh, with the exception of residents on Lighthouse Lane on the southern edge	Short term and reversible. Localised significant effects would occur

Receptor	Baseline	Sensitivity	Magnitude of Change	Significance of Effect	Duration of Effect
	<p>south. The historic core of the village is inset from the coastal edge. Village expansion has occurred southwards along Whimpwell Street and Lighthouse Lane, and eastwards along Beach Road. It is these southern parts of the village that would lie closest to the landfall construction and which are most likely to be affected.</p>	<p>historic character.</p> <p>The susceptibility of village residents to the proposed project is limited by its inward-looking nature and the screening effect of mature tree cover along Beach Road and intervening landform adjacent to Happisburgh Lighthouse. While the southern end of Lighthouse Lane comes close to the landfall site, the views of residents are fairly well contained by rear garden boundaries and intervening vegetation. Residents' views are, typically longer in duration than other visual receptors and this raises their susceptibility. The overall susceptibility of residents is considered to be medium.</p>	<p>tree cover.</p> <p>The elevation of much of the village is lower than the ridge on which the lighthouse sits, and this intervening landform prevents views from extending to the section of coastline where the landfall would be located. Some visibility may occur from the southern end of Lighthouse Lane although it would be unlikely for views to occur from the properties owing to their orientation east and not south-east in the direction of the site, combined with the enclosure of the rear garden boundary fences and garden vegetation. The limited vertical and horizontal extent of the landfall combined with its separation distance from the village means that it would be unlikely to form a prominent feature in views that do occur.</p>	<p>of the settlement.</p> <p>The combination of the medium to high sensitivity and the medium magnitude of change would lead to a significant effect from the southern edge of the settlement. Across the remainder of the settlement there would be limited potential for residents to gain visibility of the temporary construction works owing to intervening built form, land form and tree cover.</p>	<p>during the 20 week construction period and then reduce to not significant post-construction.</p>
Eccles-on-Sea	<p>Eccles-on-Sea lies to the south of the landfall site. It is a more modern settlement than Happisburgh and has developed along the coastline to create a long linear settlement. The houses are typically chalet bungalows set along straight</p>	<p>The sensitivity of the views of residents on Doggett's Lane is medium to high.</p> <p>The value of the views of residents is medium. Eccles-on-Sea is not covered by any townscape or landscape designations which would otherwise denote a special value. Its</p>	<p>The magnitude of change on the views of residents as a result of the landfall construction would be medium to low.</p> <p>It is unlikely that residents would gain visibility of the landfall construction from their internal living spaces or their garden grounds owing to their single storey structure and boundary</p>	<p>Not significant to residents on Doggett's Lane and residents in the remainder of the settlement. The combination of the medium to high</p>	<p>Short term and reversible.</p> <p>20 week construction period.</p>

Receptor	Baseline	Sensitivity	Magnitude of Change	Significance of Effect	Duration of Effect
	<p>traditional streets with garden grounds but no substantial vegetation. To the north and south, the development spreads further along the coastline as a single row of bungalows facing out towards the North Sea. As the settlement is largely spread along the coastline, it is only the northern strip, on Doggett's Lane, that has potential to be affected by the proximity of the proposed project. This comprises a row of chalet bungalows enclosed by fences and garden vegetation.</p>	<p>value relates to the close relationship between the settlement and the sea, with many of the dwellings set on the coastal edge and affording extensive seascape views.</p> <p>The susceptibility of residents in Eccles-on-Sea to the effects of the landfall is limited by the orientation of the dwellings north-east towards the sea. Furthermore, the single storey nature of the chalets on Doggett's Lane, combined with the enclosure of the rear gardens by boundaries and vegetation, would limit visibility of the landfall site. The proximity of the site to residents on Doggett's Lane would, however, lead susceptibility to be medium to high.</p>	<p>enclosures combined with the distance of the construction works and the oblique angle at which they would be located relative to the properties. The landfall would be located a sufficient distance from Eccles-on-Sea and be of a sufficiently small scale, so as not to redefine the character of residents' views.</p>	<p>sensitivity combined with the medium to low magnitude of change would lead to a not significant effect.</p>	
Whimpwell Green	<p>Whimpwell Green is a hamlet set to the south of the village of Happisburgh, to which it is connected by the extension of Whimpwell Street. The settlement is linear and mostly single-sided with properties set along the north-eastern side of the road, such that they front towards the south-west and back towards the north-east. The landform rises slightly to the</p>	<p>The sensitivity of the views of residents at Whimpwell Green is medium.</p> <p>The value of the views of residents is medium. Whimpwell Green is not covered by any townscape or landscape designations which would otherwise denote a special value. Its value relates to the visual amenity of residents which is associated with the frontage onto the street, as well</p>	<p>The magnitude of change on the views of residents as a result of the landfall construction would be medium to low.</p> <p>It is unlikely that residents would gain visibility of the landfall construction from their ground floor living spaces or their garden grounds owing to their boundary enclosures combined with the distance of the construction works. The landfall would be located a sufficient distance from Whimpwell Green and be of a sufficiently small scale with low</p>	<p>Not significant.</p> <p>The combination of the medium sensitivity combined with the medium to low magnitude of change would lead to a not significant effect.</p>	<p>Short term and reversible.</p> <p>20 week construction period.</p>

Receptor	Baseline	Sensitivity	Magnitude of Change	Significance of Effect	Duration of Effect
	north-east, which precludes views to the coast.	as the rural aspect to the rear. The susceptibility of residents to the effects of the landfall is limited by their distance from the landfall site and the limited scale, in particular the low vertical extent of the construction works, which would moderate its effect on visual amenity. The proximity of the running track to residents in the north of the hamlet would, however, lead susceptibility to be medium.	vertical extents, so as not to give rise to a notable effect. The presence of the running track through the north of the hamlet would have a more notable close-range effect, although would only have intermittent effects on residential visual amenity and therefore would not redefine the character or quality of the views.		
PRoW Happisburgh RB22	The Happisburgh RB22 PRoW connects the village of Whimpwell Green with the Norfolk Coastal Path at a point close to the northern end of Doggett's Lane. From the Whimpwell Green side, intervening landform prevents views of the coast. The views are therefore characterised by open arable farmland with a distinct lack of enclosure and tree cover. From the Doggett's Lane side, views are characterised by the coast and this forms a more interesting feature for walkers.	The sensitivity of walkers on PRoW Happisburgh RB22 is medium to high . The value of views from PRoW RB22 is medium. This rating is moderated by the absence of any formal viewpoints or landscape designations covering the area. While the views on the landward side are unremarkable, on the coastal side they are of greater scenic value. The susceptibility of walkers to the landfall construction is medium to high on account of the proximity of the PRoW to the landfall construction and the activity of walkers in this area.	The magnitude of change on the views of walkers would be medium to high in the local area and low or no effect across remaining parts. The location of the PRoW along the southern edge of the landfall means that it would be likely to be diverted during the construction phase. From a diverted route around the landfall construction, walkers would experience close range views of the mobilisation area and site with the associated presence and activity of plant. Although the baseline landscape is already influenced by intensive farming, the landfall construction would appear at variance with the rural character and this would give rise to a notable effect.	Significant. The combination of the medium to high sensitivity and the medium to high magnitude of change would lead to a localised significant effect. This would be primarily on account of the close range from which walkers would experience the visual effects of the landfall construction.	Short term and reversible. Localised significant effects would occur during the 20 week construction period and then reduce to not significant post-construction.

29.7.5.2 Potential impacts during construction - onshore cable route

131. The onshore cable route will connect the landfall at Happisburgh South with the Necton National Grid substation, covering a route of approximately 60km (Figures 29.2 and 29.3). It would be routed through the rural area to the north of Norwich. From the landfall at Happisburgh South, the onshore cable route would cross agricultural land heading north-west and passing the small settlements of Ridlington and Edingthorpe Green, and on to the north of North Walsham. The cable route then would cross the Norwich – Sheringham railway line and A149 before heading south-west past the small settlement of Banningham, crossing the A140 and the river Bure to the north of Aylsham. The onshore cable route would then continue south-west, passing the small settlements of Cawston and Reepham before turning south towards the River Wensum. It would then pass to the south of Swanton Morley before crossing the Mid Norfolk Railway to the north of Dereham and the A47 west of Dereham, finally reaching the onshore project substation at Necton.
132. The impact of the onshore cable route during the construction phase relates principally to the following features of the construction process:
- The effect on the landscape element of agricultural land owing to the excavation of the 45m wide Norfolk Vanguard and Norfolk Boreas onshore cable route for 4 trenches, construction of running track and formation of spoil heaps.
 - The effect on the landscape element of agricultural land owing to the presence of the temporary mobilisation areas (100m x 100m or 150m x 100m if combined with trenchless drilling compounds), trenchless drilling compounds (up to 100m x 50m launch and 50m x 50m reception or 150m x 50m launch if incorporating a stop end) and running tracks connecting to the road network.
 - The effect on the landscape element of hedgerows and trees owing to the excavation for the 20m to 25m working width onshore cable route for Norfolk Vanguard and Norfolk Boreas.
 - The effect on landscape character and visual amenity owing to the presence of the temporary, surfaced and fenced mobilisation areas, and trenchless drilling compounds, and their content of plant, materials and welfare facilities.
 - The effect on landscape character and visual amenity owing to the presence of the 45m wide onshore cable route (20m to 25m through hedgerows and trees), including trenches, running tracks and spoil heaps.
 - The effect on landscape character and visual amenity owing to the activity associated with the instalment of the mobilisation areas, trenchless drilling compounds, the duct installation, trenchless drilling (e.g. HDD), cable pull through, construction of the 150 jointing pits, and construction of running track and temporary running tracks.
 - The cable duct installation will take place in approximately 150m sections, with each section having an indicative construction period of one week (including

- open cut trenching) within an overall two year window. Cable pull would occur at a later date in line with proposed project phasing.
- The reinstatement of ground at the mobilisation areas, trenchless drilling compounds, cable relay easements and haul roads, and reinstatement of hedgerow and trees, at the end of construction.
133. [Table 29.10](#) shows the detail of the assessment for each receptor. In summary, all agricultural land and the vast majority of hedgerows and trees would not be significantly affected as a result of the onshore cable route construction. In a small number of locations, where notable hedgerows and trees would be removed, localised significant effects would occur. There would be no significant effects on designated landscapes including the RPGs at Blickling Hall or Salle Park. In terms of roads, significant effects would occur within localised sections of the A47, A149, B1146, B1147, A1067, B1145 (west of Cawston), Heydon Road and Lime Kiln Road, while effects would be not significant on all remaining parts of these roads and other roads and railways. The recreational route of the Wensum Way would undergo significant effects, albeit over very localised extents while the effects on all other recreational routes would be not significant. There would be no significant effects on settlements along the length of the onshore cable route.
134. At the end of the construction phase, land over the onshore cable route, mobilisation areas, trenchless drilling compounds and running tracks would be reinstated to agricultural use. Hedgerows would be reinstated in the 20m to 25m sections where they have been removed for open-cut trenching, however hedgetrees and trees would not be permitted to be replanted over a 6m to 10m wayleave either side of the 20m to 25m cable easement, owing to restrictions of tree planting over or close to cables.
135. The majority of the effects would therefore relate to the construction works and be short to medium term, with effects mitigated through reinstatement of the land and hedgerows as far as practicable and permissible. Residual impacts would occur in the few instances where trees would be removed and not replaced owing to restrictions over cable easements. These effects would be long term but not irreversible as replanting of hedgetrees and trees could take place following decommissioning and the planting of hedgerows in the interim would offset the loss.
136. The only other operational impact in respect of the onshore cable route would relate to the presence of the link boxes which would be located at every two to three joint locations. These would be 1.5m x 1.5m (per circuit) and either buried to ground level or above ground as cabinets set along field boundaries and in accessible locations. Their impact on landscape and visual receptors would be limited by their small scale, their typically discreet locations and the infrequency at which they would occur across the landscape.

Table 29.10 Potential impacts during construction - onshore cable route

Receptor	Baseline	Sensitivity	Magnitude of Change	Significance of Effect	Duration of Effect
Physical Effects					
Agricultural land	<p>Arable farmland is the predominant land use along the length of the onshore cable route and is widespread throughout the Norfolk landscape. It is cultivated for crops and as such the land is constantly being disturbed as crops are planted or harvested. The changing appearance of the arable landscape and the activities associated with ploughing fields or planting and harvesting crops are a common and integral characteristic of the agricultural landscape. The presence and activity of farm machinery is also a feature of the arable farmland and on the rural roads.</p>	<p>The sensitivity of agricultural land is considered to be medium to low.</p> <p>The onshore cable route does not cross any designated landscapes and the agricultural land has no special value in relation to its characteristics as a landscape element. The value of the agricultural land is considered to be medium to low.</p> <p>Due to the level of existing disruption as a result of crop cultivation, combined with the widespread occurrence of agricultural land as a landscape element, the susceptibility to the proposed project is considered to be medium to low.</p>	<p>The magnitude of change would be medium to low in those areas where onshore cable route construction would occur and medium where mobilisation areas and trenchless drilling compounds would be located.</p> <p>The vast majority of the onshore cable route construction would take place on arable farmland. It would occur within the context of fields which are regularly modified by agricultural practises. The level of change relating to the cable route trenching, the construction of running tracks, and presence of soil bunds within the 45m route, and temporary fencing along its length, would form a relatively small-scale, short-term and localised disturbance to the agricultural land.</p> <p>After the cable has been laid, the trench would be backfilled and temporary working areas and running tracks removed. The agricultural land would then return to its previous use. Re-instatement is</p>	<p>Not significant.</p> <p>The combination of the medium to low sensitivity with the medium to low magnitude of change of the onshore cable route and medium magnitude of change of the mobilisation areas would lead to a not significant effect. This is a result of the absence of natural vegetation, the presently disturbed nature of the land and the ease with which reinstatement</p>	<p>Short term and reversible in respect of construction of onshore cable route.</p> <p>Cable trenching would take 1 week for each 150m stretch, in the first 2 years.</p>

Receptor	Baseline	Sensitivity	Magnitude of Change	Significance of Effect	Duration of Effect
			<p>therefore considered relatively straightforward with minimal disruption required to return the land to its previous uses and productivity.</p> <p>Mobilisation areas and trenchless drilling compounds would require a larger land take, although still only occupying a small proportion of the wider agricultural landscape and spaced sufficiently to reduce the potential for sequential effects.</p>	would occur.	
Hedgerows and hedgetrees	<p>Hedgerows and hedgetrees are a common feature in the rural landscape in which the onshore cable route crosses, varying in height, continuity and condition. Some hedgerows appear more formally managed, others have a scrubby form often with a fragmented appearance. Where trees are found within hedgerows they vary in size, age frequency and condition. Although hedgerow removal has occurred extensively in parts of the study area, they still form an important component of the rural and historic landscape character.</p>	<p>The sensitivity of hedgerows and hedgetrees is medium or medium to high.</p> <p>The value is considered to be medium to high as the hedgerows and hedgetrees are of importance to the historical pattern of the landscape and the character of enclosure that typifies this rural landscape.</p> <p>The susceptibility of most hedgerows to the proposed project is medium to low. The sections of hedgerow lost would be reinstated post construction and as this can be achieved with relative ease this reduces their overall susceptibility to the onshore cable route. The</p>	<p>Careful consideration of cable routeing has sought to reduce the amount of hedgerow and hedgetree removal along the route. An easement of the 45m onshore cable route to a reduced working width of 20m to 25m when crossing hedgerows reduces potential losses of this landscape feature. 20m to 25m would create a notable gap, which in hedgerows in good condition, continuous and mature, would be apparent, but which in hedgerows which are in poor condition, low and fragmented, would have a limited effect.</p> <p>Reinstatement of lost hedgerows would mitigate the effects by infilling gaps and completing the enclosure,</p>	<p>The impact on the majority of hedgerows and hedgetrees would be not significant. This relates to the medium sensitivity and medium to low magnitude of change.</p> <p>The impact on hedgerows and hedgetrees listed in the sensitivity column as being the most susceptible to</p>	<p>Medium term or long term and reversible. The significant effect would last 3-5 years for low hedgerows and 5-10 years for high hedgerows, after which the effects would reduce to not significant for the remainder of the project's indicative design life.</p> <p>The loss of hedgetrees would be long term,</p>

Receptor	Baseline	Sensitivity	Magnitude of Change	Significance of Effect	Duration of Effect
		<p>susceptibility of hedgetrees and good condition hedgerows is medium to high, as owing to their greater height, their loss would be more apparent and their reinstatement longer term.</p> <p>Those hedgerows most susceptible to the project occur at the following crossing points;</p> <ul style="list-style-type: none"> • Blickling Road, N of Aylsham; • Silvergate Lane, NW of Aylsham; • Aylsham Road, W of Aylsham; • Elsing Road, near River Wensum; • B1145, N of Reephram; and • B1145, W of Reephram. 	<p>taking 3-5 years for low hedgerows and 5-10 years for high hedgerows. Restrictions applied to planting over cable easements prevents hedgetrees from being replanted over the 20m to 25m working width with an additional 6 to 10m width either side to be included as a wayleave.</p> <p>The magnitude of change would vary. The majority of the hedgerow losses would give rise to a medium to low magnitude of change as they occur in landscapes where hedgerow erosion is common, and hedgerows are either in poor condition, scrubby, low or fragmented. These would be easily replaced.</p> <p>For better condition, taller and complete hedgerows, often with hedgetrees present, the magnitude of change would be medium and would apply to those sections of hedgerows identified in the sensitivity column as being most susceptible.</p>	<p>the project would be significant. This relates to the combination of the medium to high sensitivity and the medium to high magnitude of change.</p> <p>While hedgetrees removed over cable easements could not be replanted, hedgerows could be replanted and this would aid offset the loss, however, the effect would still be significant.</p>	<p>lasting the 30 years of the project's indicative design life and reversible following decommissioning.</p>
Trees and Woodlands	Individual trees and woodlands, including small groups of trees, larger woodlands and estate woodlands add character to the study area of the onshore cable	<p>The sensitivity of trees and woodlands to the proposed project is medium to high.</p> <p>The value is considered to be</p>	Careful consideration of cable routeing and inclusion of additional trenchless crossings means that all woodlands and trees across the 60km route would be avoided with	Not significant. The medium to high sensitivity combined with	<p>Long-term and reversible.</p> <p>In the limited number of cases</p>

Receptor	Baseline	Sensitivity	Magnitude of Change	Significance of Effect	Duration of Effect
	<p>route. Larger woodlands typically occur as part of designed landscapes and while some woodland plantations occur, they are not a common feature. Smaller blocks of woodland occur intermittently across the landscape and provide a notable contribution to the character and pattern of the landscape. Trees and woodlands in the area are connected by the frequent hedgerows that line roads and field boundaries and together provide enclosure within an otherwise open agricultural landscape. Built settlement edges and church towers are often seen in the context of mature trees.</p>	<p>medium to high as the trees and woodland are of importance to the historical pattern of the landscape and the character of enclosure that typifies this rural area.</p> <p>The susceptibility of the trees and woodlands to the proposed project is medium to high. There would be a restriction on tree planting over the permanent easement of 20m to 25m with an additional restricted section of 6 to 10m on either side. Although quick thorn and blackthorn hedgerows could be planted over the easement, in areas of mature woodland, the lower height and limited form would be readily apparent and give rise to long term effects. Re-establishment of tree or woodland structure beyond this 32 to 40m route would take approximately 20 years for 10m growth and this further heightens the overall susceptibility of this landscape element.</p> <p>Those trees most susceptible to the proposed project occur at the following crossing points;</p> <ul style="list-style-type: none"> • Colby Road, N of Banningham; • Minor road near Hackford Hall; and 	<p>the exception of a small number of road-side trees (the removal of hedgetrees is assessed in the assessment of hedgerows and hedgetrees above). The overall magnitude of change would therefore be negligible.</p> <p>Those localised trees susceptible to significant effects are identified in the sensitivity column. In these locations open trenching would be carefully sited so as to minimise the number of trees to be removed, targeting poorer condition specimens or by using existing gaps in the tree line. These trees are generally of reasonable condition and the magnitude of change is therefore considered to be medium to high within these localised locations.</p> <p>Restrictions applied to planting over cable easements prevents trees and woodland from being replanted over the 20m to 25m working width with an additional 6-10m width either side.</p> <p>While the overall magnitude of change would be negligible, in respect of the locations listed in the sensitivity column, the magnitude of</p>	<p>the negligible magnitude of change would lead to a not significant effect. A significant effect would occur in relation to trees listed in the sensitivity column as being the most susceptible to the project, subject to the exact route of the onshore cable.</p>	<p>where tree removal would occur over the cable easement, replanting of trees would not be permitted and the effects would be long term lasting the 30 years of the project's indicative design life and reversible following decommissioning</p>

Receptor	Baseline	Sensitivity	Magnitude of Change	Significance of Effect	Duration of Effect
		<ul style="list-style-type: none"> Norwich Road, Swanton Morley. 	change would be medium or medium to high, depending on the exact route and subsequent losses.		
Landscape Receptors					
Salle Park	Salle Park is a designated landscape in Historic England's 'Register of Parks and Gardens'. It is located approximately 2km north-east of Reepham and to the immediate north of the B1145 with minor roads to the west and east. The surrounding landscape comprises arable farmland and the landform falls gently from south-west to north-east. The designed landscape is set around Salle Hall, an 18 th century Palladian country house, and includes formal gardens and a walled kitchen garden. Historic England's description states ' <i>it enjoys a very rural setting and is almost entirely surrounded by dense perimeter plantations.</i> ' This enclosure limits the visual association between the designed landscape and the surrounding landscape although the south-east drive emerges at the corner closest to the proposed project and gothic cottage, Cawston	<p>The sensitivity of Salle Park to the proposed project is medium to high. The value of Salle Park is high. Its inclusion in the Register of Parks and Gardens denotes its national importance.</p> <p>The susceptibility of Salle Park to the proposed project is medium. The designed landscape is enclosed by dense woodland such that there is no visibility of the landscape to the east where the mobilisation area would be located and the south-east where the onshore cable route construction would take place. The only potential for visibility would occur from the south-east corner where the gated entrance to the south-east drive occurs, although its recessed location within mature tree cover combined with the hedgerow enclosure along the B1145 would limit any such potential.</p>	<p>The magnitude of change on Salle Park as a result of the proposed project would be low.</p> <p>There would be no visibility of the proposed project from the designed landscape owing to the maturity and density of the perimeter planting along the southern and eastern boundaries. At the south-east gated entrance, the potential for visibility is limited by enclosing tree and hedgerow cover, and if visibility were to occur the construction works would appear relatively small in scale. While the mobilisation area and onshore cable route construction would potentially have an impact on the setting of the designed landscape, from the B1145, where the impacts would occur, the hedgerows would screen much of the construction works with the exception of where a 20m to 25m break would be formed at the crossing point. The mobilisation area would be seen to the fore of the</p>	Not significant. The combination of the medium to high sensitivity and the low magnitude of change would lead to a not significant effect. While the mobilisation area would be seen within the setting of Salle Park on the west-bound approach along the B1145, the limited extent of visibility would moderate the effect.	<p>Short term and reversible in respect of onshore cable route construction (not significant).</p> <p>Medium term and reversible in respect of hedgerow re-establishment (not significant).</p>

Receptor	Baseline	Sensitivity	Magnitude of Change	Significance of Effect	Duration of Effect
	Lodge, is located on the opposite side of the B1145 to this entrance.		mature and dense woodland edge and not in association with the house or any formal parts of the designed landscape.		
Blickling Hall	<p>Blickling Hall is a designated landscape in Historic England's 'Register of Parks and Gardens'. It is located approximately 1km to the north-west of Aylsham. 17th century Blickling Hall forms the centre-piece around which the formal gardens are set, the main area of which lies to the east. Views from the raised terrace behind the Doric Temple on this eastern side are channelled by the avenue of trees and are described in Historic England's description as '<i>the main view out of the site.</i>' Parkland occurs on this eastern side, bounded by a minor road enclosed by hedgerow and intermittent tree cover but with occasional gaps in the cover.</p>	<p>The sensitivity of Blickling Hall to the proposed project is medium to high. The value of Blickling Hall is high. Its inclusion in the Register of Parks and Gardens denotes its national importance.</p> <p>The susceptibility of Blickling Hall to the proposed project is medium to low. The onshore cable route would be located in the arable farmland approximately 200m to the south of the closest RPG boundary, set beyond intervening Flash Pit Farm.</p> <p>The main formal gardens are located on the eastern side of the house, and views from these gardens are contained by hedges and tree cover and do not extend beyond the Doric Temple at the end of the eastern axis. The cable route would be located approximately 500m from the eastern boundary of the parkland.</p>	<p>The magnitude of change on Blickling Hall as a result of the proposed project would be low.</p> <p>There would be no visibility of the proposed project from the ornamental gardens around Blickling Hall owing to the enclosure of mature trees and other vegetation. It would be the southern parkland that would be closest to the onshore cable route construction. Although a more marginal part of the designed landscape, it is from here that views out towards the surrounding landscape can be experienced.</p> <p>Visibility of the construction works to the south of Flash Pit Farm would, however, be limited by intervening hedgerows and intermittent trees and the separation distance of approximately 200m from the southern boundary. Where glimpsed views would occur, the construction works would be seen as a relatively small-scale operation on land</p>	<p>Not significant.</p> <p>The combination of the medium to high sensitivity and the low magnitude of change would lead to a not significant effect. While there is the potential for limited visibility to occur from the southern parkland this would not redefine the character of the designed landscape.</p>	<p>Short term and reversible in respect of onshore cable route construction (not significant).</p> <p>Medium term and reversible in respect of hedgerow re-establishment (not significant).</p>

Receptor	Baseline	Sensitivity	Magnitude of Change	Significance of Effect	Duration of Effect
			previously disturbed by cultivation.		
North Walsham and Dilham Canal	North Walsham and Dilham Canal connects Antingham with the River Ant at Smallburgh. It was originally constructed to transport agricultural products but has been disused since 1934. While attempts have been made to re-open the canal for leisure use, it is still currently disused, although sections have been cleared and some restoration works carried out. The character along the canal is mixed with some sections open and influenced by the surrounding agricultural landscape, and others enclosed by vegetation. The section which is to be crossed by the onshore cable route is located to the north of Little London and the south of Pigney's Wood.	<p>The sensitivity of the canal to the construction of the onshore cable route is medium.</p> <p>The value of the canal is medium. The canal and the surrounding area are not covered by any scenic landscape designations which would otherwise denote a special value. The canal is, nonetheless, of local value and an attractive feature in the local landscape.</p> <p>The susceptibility of the canal is medium to low as the construction of the onshore cable route would not directly affect the canal, due to the use of trenchless techniques under the canal and the location of mobilisation areas in the surrounding landscape.</p>	The magnitude of change on the North Walsham and Dilham Canal would be medium to low . The use of trenchless crossing techniques (e.g. HDD) to install ducts under the canal would mean that the canal and the land adjacent to it on either side would remain unaffected. The presence of the trenchless mobilisation areas would be offset in the fields either side of the canal and although these would not have a direct effect on the canal, there would be a visual influence on the character of the canal which would add to the magnitude of change.	Not significant. The combination of the medium sensitivity and the medium to low magnitude of change would lead to a not significant effect.	Short term and reversible.
Visual Receptors					
Dereham Road	Dereham Road connects the A47 to the west of Wendling with Dereham to the east. The onshore cable route runs roughly parallel to the A47 and would cross the section between	<p>The sensitivity of the views of road-users on this section of Dereham Road is medium.</p> <p>The value of the views from the road is medium. There are no formal viewpoints and the views are not</p>	<p>The magnitude of change as a result of the onshore cable route would be medium within an approximate 120m section and low or no effect in all remaining sections.</p> <p>The medium magnitude of change</p>	Not significant, with the exception of a localised significant effect over an	Short term and reversible in respect of the onshore cable route. Localised significant effects

Receptor	Baseline	Sensitivity	Magnitude of Change	Significance of Effect	Duration of Effect
	Wendling in the west and Scarning in the east. The character along this straight section of road is rural, with hedgerows and intermittent trees aligning the road-side to the north and south. While the hedgerows are mostly continuous, there are notable gaps, especially close to the junction with Dale Road, where the mobilisation area would be located.	representative of a designated landscape. There are no special features visible from this section of Dereham Road and the views from the road are either contained within the short range by hedgerows and hedgetrees or extend some short way into adjacent fields. The susceptibility of road-users is medium. Their views are experienced whilst in transit and at speeds of 40-60mph. The mobilisation area would be located on the north side of Dereham Road, close to the Dale Road junction, which would be partly visible to road-users and this increases their susceptibility to the proposed project.	would occur as a result of the presence of the mobilisation area in the adjacent agricultural field to the north of Dereham Road. The scale and character of this temporary mobilisation area would form a notable feature on account of the enclosure of the fencing, large surfaced area and content of plant, materials, site offices and welfare facilities, which would appear at variance with the scale and character of the baseline rural landscape. While the effect would be moderated by the intervening hedgerows and trees, there would be sufficient gaps for the mobilisation area to be visible to road-users.	approximate 120m section of the Dereham Road. The combination of the medium sensitivity and the medium magnitude of change would lead to a significant effect within the localised area.	would last for the 2 year construction phase and reduce to not significant post-construction. Medium term and reversible in respect of hedgerow re-establishment (not significant).
A47	The A47 is the main road connecting Great Yarmouth in the east with Leicester in the west and forms the main east-west route through Norfolk, linking Norfolk with King's Lynn and Peterborough. It is a busy main road, comprising a mix of single and dual carriageways and passing through, mostly rural, but also urban areas. The onshore cable route crosses the section	The sensitivity of the views of road-users on this section of the A47 is medium . The value of the views from the road is medium. There are no formal viewpoints and the views are not representative of a designated landscape. There are no special features visible from this section of the A47 and the views from the road are either contained within the short range by tree cover or medium	The magnitude of change as a result of the onshore cable route would be medium over an approximate 150m section and low or no effect in all remaining sections. The use of trenchless construction would mean the presence and activity of plant would be recessed from the road edge. This would mean roadside vegetation would not need to be removed and this would reduce the overall impact. The	Not significant , with the exception of a localised significant effect over an approximate 150m section of the A47. The combination of the medium sensitivity and	Short term and reversible in respect of the onshore cable route. Localised significant effects would last for the 2 year construction phase and reduce to not significant post-

Receptor	Baseline	Sensitivity	Magnitude of Change	Significance of Effect	Duration of Effect
	between Wendling in the west and Dereham in the east, where the road is single carriageway and straight. The character is most strongly influenced by the mature tree cover which encloses much of the road-side with some middle range views opening up over the surrounding farmland.	range by surrounding field boundaries. The susceptibility of road-users is medium. Their views are experienced whilst in transit and at speeds of 40-60mph. Despite the use of trenchless construction, large mobilisation areas would be located either side of the A47, which would be partly visible to road-users and this increases their susceptibility to the proposed project.	presence and activity associated with the trenchless drilling compound and mobilisation area to the north, would be partly visible to road-users over the scrubby hedgerow that aligns an approximate 200m stretch to the north. The trenchless drilling compound to the south would also be partly visible owing to the intermittent breaks in tree cover. While the speed of road-users at 40-60mph, combined with the partial enclosure from hedgerow and trees would moderate the effect, the presence of compounds on either side of the road would add to the overall magnitude of change.	the medium magnitude of change would lead to a significant effect within the localised area.	construction. Medium term and reversible in respect of hedgerow re-establishment (not significant).
B1146 (north of Dereham)	The B1146 links Dereham to Fakenham. The cable route crosses this road to the north of Brick Kiln Farm, north of Dereham. A mobilisation area is proposed for the fields to the east of this road. To the south of where the onshore cable route crosses the B1146, mature hedgerow and hedgetrees enclose the western roadside while the eastern roadside is largely open. In the section where the onshore cable route crosses	The sensitivity of the views of road-users on this section of the B1146 is medium . This road is not located within any national, regional or local scenic designations or recognised scenic views. There are no special features visible from this section and the value is considered to be medium to low. The national speed limit applies, and susceptibility is influenced by the speed of travel on a relatively straight section of road. The	The magnitude of change as a result of the onshore cable route would be medium to high along an approximate 800m section of the road and low or no effect in all remaining sections. Potential changes in the views would occur as a result of the location of the mobilisation area and associated cable route construction activities within the open agricultural fields to the east of the B1146. The effect of vegetation removal along the road-side would be moderated by its	Not significant , with the exception of a localised significant effect over a section of approximately 800m of the B1146, centred on the mobilisation area. The combination of the medium	Short term and reversible in respect of onshore cable route. Localised significant effects would last for the 2 year construction phase and reduce to not significant post-construction. Medium term and

Receptor	Baseline	Sensitivity	Magnitude of Change	Significance of Effect	Duration of Effect
	and to the north of this, there are occasional trees, mostly spaced out and stunted, and very fragmented hedgerow on the western and eastern roadside, such that both sides are largely open. The arable fields to the west and east are large and open with only distant enclosure.	surrounding landscape is open in sections and roadside vegetation is fragmented such that views across the landscape occur where the cable route crosses, but also on approach from the north and south. On balance, susceptibility is considered to be medium.	existing fragmented nature. While the speed of travel would influence the ability of road-users to focus on the details of the mobilisation area, its proximity to the road and extent along the roadside would intensify the construction effects experienced from this road. Replacement hedgerows would be planted, which would take up to 3-5 years to establish.	sensitivity with the medium to high magnitude of change would lead to a localised significant effect.	reversible in respect of hedgerow re-establishment (not significant).
B1147 (south of Swanton Morley)	The B1147 connects Dereham to the south with Bawdeswell to the north-east. The section of the B1147 relevant to the assessment lies to the south of the village of Swanton Morley. The character along this section is typically rural with open fields of arable farmland on either side. While the enclosure along the east-west field boundaries, perpendicular to the road are mature and dense, the enclosure along the road-side has been eroded, such that in the section adjacent to the proposed mobilisation area, there is no enclosure. The landscape is generally flat, and	The sensitivity of the views of road-users on this section of the B1147 is medium to high . The value of the views from the road is medium. There are no formal viewpoints and the views are not representative of a designated landscape. There are no special features visible from this section of Dereham Road and views are typically contained within the medium range. The susceptibility of road-users is medium to high. Their views are experienced whilst in transit and at speeds of 40-60mph. The mobilisation area would be located on the eastern side of Dereham	The magnitude of change as a result of the onshore cable route would be medium to high within an approximate 200m section and low or no effect in all remaining sections of the road. The medium to high magnitude of change would occur as a result of the presence of the mobilisation area in the adjacent agricultural field to the east of the B1147. The scale and character of this temporary mobilisation area would form a notable feature on account of the enclosure of the fencing, large surfaced area and content of plant, materials, site offices and welfare facilities, which would appear at	Not significant , with the exception of a localised significant effect over an approximate 200m section. The combination of the medium to high sensitivity and the medium to high magnitude of change would lead to a significant effect within the	Short term and reversible in respect of onshore cable route. Localised significant effects would last for the 2 year construction phase and reduce to not significant post-construction. Medium term and reversible in respect of hedgerow re-establishment

Receptor	Baseline	Sensitivity	Magnitude of Change	Significance of Effect	Duration of Effect
	the views largely contained within the close to middle range.	Road, making it completely visible to road-users and this increases their susceptibility to the proposed project.	variance with the scale and character of the baseline rural landscape. While the backdrop of the mature tree cover to the north of the mobilisation area would moderate the effect, the openness of the road-side would ensure the mobilisation area would be visible to road-users over an approximate 200m stretch.	localised area.	(not significant).
Lime Kiln Road	Lime Kiln Road is the minor road which connects Dereham Road in the west with Fakenham Road in the east. It is located to the north of River Wensum and its associated wetlands and is surrounded by arable farmland. In the section eastwards from Elsing Lane to where the road turns north past Sparham Hole, roadside hedgerows have been removed and only intermittent or small groups of mature trees remain, more so along the southside, with the northside largely open. The views of road-users are characterised by an open rural landscape with limited enclosure and little visible built development. Along the northern section of Lime Kiln Road, bushy and continuous hedgerows	<p>The sensitivity of the views of road-users on these sections of Lime Kiln Road is medium.</p> <p>The value of the views from the road is medium. There are no formal viewpoints and the views are not representative of a designated landscape. There are no special features visible from these sections of Lime Kiln Road and the views from the road are either typical of the wider rural area or enclosed by hedgerows.</p> <p>The susceptibility of road-users is medium along the open section, where the open and clear aspect of the surrounding landscape makes them susceptible to changes in this landscape. The susceptibility of road-users is medium to low in the enclosed section, where hedgerows largely enclose the extent of the</p>	<p>The magnitude of change as a result of the onshore cable route construction would be medium for an approximate 1.2km section and further 0.2km section and low or no effect in all remaining sections of the road.</p> <p>While there would be no mobilisation area along this section of road, the potential for significant effects relates to the proximity of the onshore cable route to Lime Kiln Road along a notably long extent. The onshore cable route would run parallel to the road, and although the scale of the construction works would be relatively small, the openness of the views and proximity to the road would raise the prominence and make the construction works a defining feature in the views of road-users.</p>	Not significant , with the exception of a localised significant effect over localised sections of approximately 1.2km and further 0.2km section of Lime Kiln Road. The combination of the medium sensitivity and medium magnitude of change would lead to a significant effect.	Short term and reversible in respect of onshore cable route. Localised significant effects would last for the 2 year construction phase and reduce to not significant post-construction. Medium term and reversible in respect of hedgerow re-establishment (not significant).

Receptor	Baseline	Sensitivity	Magnitude of Change	Significance of Effect	Duration of Effect
	largely enclose the road apart from the elevated section which occurs closer towards the A1067.	views apart from in the more elevated sections.	In the section of the road close to the mobilisation area, the magnitude of change would be medium. Despite the enclosure of the intervening hedgerows, where glimpsed views over or through the hedgerow occurred, the scale and character of the mobilisation area would appear at variance with the baseline rural character.		
A1067 (west of Sparham)	The A1067 is the main road between Norwich and Fakenham. The onshore cable route crosses this road to the west of Sparham with a mobilisation area proposed for the fields to the north of the A1067 and south of Well Lane. Grass verges align the north and south sides of the A1067, with some sections of low and fragmented hedgerows, leaving the views of road-users relatively open between the east and west junctions with Well Lane. These views extend across the adjacent arable fields where enclosure is also limited. This is a predominantly rural landscape with some influence from rural villages such as Sparham.	<p>The sensitivity of the views of road-users on this section of the A1067 is medium.</p> <p>This road is not located within any national, regional or local scenic designations or recognised scenic views and value is considered to be medium.</p> <p>The national speed limit applies and for the majority of A1067 road users, views of the surrounding landscape are experienced whilst travelling at speeds of between 40-60mph. Despite this, roadside hedgerows have been badly eroded along this section and the opportunities for views into the surrounding fields are available from relatively long sections of road on approach to the mobilisation area. On balance, susceptibility is</p>	<p>The magnitude of change as a result of the onshore cable route construction would be medium to high within an approximate 300m section and low or no effect in all remaining sections of the road.</p> <p>The medium to high magnitude of change would occur as a result of the presence of the mobilisation area in the adjacent agricultural field to the north of the A1067. The scale and character of this temporary mobilisation area would form a notable feature that would appear at variance with the scale and character of the baseline rural landscape. The mobilisation area would appear notable on account of the fenced enclosure and surfaced compound of the mobilisation area and its content of materials, plant and welfare</p>	Not significant , with the exception of a localised significant effect within a section of approximately 300m of the A1067. The combination of the medium sensitivity and the medium to high magnitude of change would lead to a significant effect.	<p>Short term and reversible in respect of onshore cable route. Localised significant effects would last for the 2 year construction phase and reduce to not significant post-construction.</p> <p>Medium term and reversible in respect of hedgerow re-establishment (not significant).</p>

Receptor	Baseline	Sensitivity	Magnitude of Change	Significance of Effect	Duration of Effect
		considered to be medium.	facilities. The extent of this effect would occur along the section of the A1067 between the west Well Lane junction and the properties close to the east Well Lane junction.		
B1145 (west of Cawston)	The B1145 connects King's Lynn in the west with Mundesley in the east. The onshore cable route crosses the B1145 approximately 1.2km west of Cawston. A mobilisation area would be located to the immediate north of the B1145 and this would lie to the east of Salle Park. The north side of this section of the B1145 is enclosed by hedgerow. This forms an almost continuous screen to road-users, apart from where a 15m opening occurs, which allows views across the adjacent arable farmland. The vegetation on the south-side is more fragmented with sections of hedgerow and scrubby vegetation, such that some views into the adjacent young woodland plantation can be gained.	<p>The sensitivity of the views of road-users on this section of the B1145 is medium.</p> <p>The value of the views from the road is medium. There are no formal viewpoints and the views are not representative of a designated landscape. Views towards the wooded boundary of Salle Park are evident to west-bound road-users and this adds to the value although the designed landscape is screened by the trees.</p> <p>The views are largely enclosed by roadside vegetation, and this reduces the susceptibility of road-users to the proposed project in the adjacent fields. Glimpsed views would, however, be experienced, to reveal the presence of the mobilisation area.</p>	<p>The magnitude of change as a result of the onshore cable route would be medium within an approximate 70m section and low or no effect in remaining sections with the exception of the sections assessed west of Reepham and North Walsham.</p> <p>Despite the close proximity of the mobilisation area in the adjacent field to the north, the intervening hedgerow would largely screen the mobilisation area apart from the crossing point where a section of hedgerow removal would be required. This would open up views from the B1145 into the mobilisation area which would be seen as a fenced and surfaced compound containing plant, materials and equipment, offices and welfare facilities. The character and scale of the mobilisation area would appear at variance with the character and scale of the baseline rural landscape. The onshore cable route</p>	Not significant , with the exception of a localised significant effect over a 70m section of the B1145. The combination of the medium sensitivity and the medium magnitude of change would lead to a significant effect.	<p>Short term and reversible in respect of onshore cable route. Localised significant effects would last for the 2 year construction phase and reduce to not significant post-construction.</p> <p>Medium term and reversible in respect of hedgerow re-establishment (not significant).</p>

Receptor	Baseline	Sensitivity	Magnitude of Change	Significance of Effect	Duration of Effect
			construction to the south would appear comparatively small in scale.		
Heydon Road (east of Aylsham)	Heydon Road is a narrow minor road linking the town of Aylsham in the east with the minor roads leading to Cawston in the west. The section of the road relevant to this assessment occupies a rural area to the west of Aylsham where mobilisation area 7 is located and the onshore cable route crosses the road from north to south. This section is heavily enclosed to the north by a dense, and mostly continuous hedgerow, whilst in contrast, to the south there is no enclosure and views extend out over the adjacent large and flat arable farm fields to where field boundaries and woodland provide more distant enclosure. Further west, hedgerows enclose both sides of the road as well as the western aspect of the mobilisation area.	<p>The sensitivity of the views of road-users on this section of the Heydon Road is medium to high.</p> <p>The value of the views from the road is medium. There are no formal viewpoints and the views are not representative of a designated landscape. Views are typical of the wider rural landscape and do not include any special features.</p> <p>The susceptibility of road-users is medium to high. While the northern side of the road is well enclosed, the southern side is exposed, and road-users would gain clear views of the mobilisation area. The susceptibility is moderated by the limited number of road-users who use this rural road and the enclosure of hedgerows which occurs to the west of the mobilisation area.</p>	<p>The magnitude of change as a result of the onshore cable route would be medium to high within an approximate 150m section and low or no effect in remaining sections.</p> <p>The close proximity of the mobilisation area in the adjacent field to the south, and the exposed nature of views in this direction would make the mobilisation area a prominent feature in views of road-users. This would be seen as a fenced and surfaced compound containing plant, materials and equipment, offices and welfare facilities. The character and scale of the mobilisation area would appear at variance with the character and scale of the baseline rural landscape. The onshore cable route construction, extending to the south would appear comparatively small in scale.</p>	Not significant , with the exception of a localised significant effect over a 150m section of Heydon Road. The combination of the medium to high sensitivity and the medium to high magnitude of change would lead to a significant effect.	Short term and reversible in respect of onshore cable route. Localised significant effects would last for the 2 year construction phase and reduce to not significant post-construction. Medium term and reversible in respect of hedgerow re-establishment (not significant).
A149 (north of North Walsham)	The A149 is the main road connecting Great Yarmouth in the south with Cromer in the north. It is a busy and fast road with many B and minor roads connecting	<p>The sensitivity of the views of road-users on this section of the A149 is medium.</p> <p>The value of the views from the road</p>	The magnitude of change as a result of the onshore cable route would be medium over an approximate 400m section and low or no effect in all	Not significant , with the exception of a localised significant effect	Short term and reversible in respect of onshore cable route. Localised

Receptor	Baseline	Sensitivity	Magnitude of Change	Significance of Effect	Duration of Effect
	<p>into it. The section which the onshore cable route crosses is located to the north of North Walsham. It is long and straight with low hedgerows in the southern part, and a mix of low scrubby vegetation in the northern part. This opens up view across the adjacent arable farmland which is characterised by large open fields and limited enclosure. To the south, the A149 passes an area of light industry on the northern side of North Walsham and this presents a more urban character.</p>	<p>is medium. There are no formal viewpoints and the views are not representative of a designated landscape. There are no special features visible from this section of the A149 and the views from the road are either contained within the short range by hedgerows or extend across the adjacent arable farmland. The susceptibility of road-users is medium. Their views are experienced whilst in transit and at speeds of 40-60mph. Despite the use of trenchless construction, large mobilisation areas would be located either side of the A149, which would be partly visible to road-users and this increases their susceptibility to the proposed project.</p>	<p>remaining sections. The use of trenchless construction would mean the presence and activity of plant would be recessed from the road edge. This would mean roadside vegetation would not need to be removed and this would reduce the overall impact. The presence and activity associated with the trenchless drilling compound would, however, be visible to road-users from open section and over lower vegetation. Despite their travel at speeds of 40-60mph, the extent of the compounds along the sides of the A149 would increase the duration of visibility. The compounds would appear at variance with the scale and character of the rural landscape.</p>	<p>over an approximate 400m section of the A149 (100m either side of the 200m onshore cable route). The combination of the medium sensitivity and the medium magnitude of change would lead to a significant effect.</p>	<p>significant effects would last for the 2 year construction phase and reduce to not significant post-construction. Medium term and reversible in respect of hedgerow re-establishment (not significant).</p>
Wensum Way	<p>Wensum Way connects Gressenhall in the west with Lenwade in the east. It passes through 12km of rural countryside, following the route of the River Wensum to the west of Lenwade and between Elsing and Swanton Morley. The remaining sections cross rural countryside. The section with greatest</p>	<p>The sensitivity of the views of recreational users on Wensum Way is medium to high. The sections of route within the study area are not located within or overlooking any national, regional or local scenic designations or recognised scenic views which might signify heightened value. The value of views from Wensum Way is</p>	<p>The magnitude of change in the section across Elsing Road would be medium to low and next to River Wensum would be medium to high. The enclosure of hedgerows along Elsing Road would largely preclude visibility of the onshore construction works apart from where the opening of 20m to 25m would occur at the crossing point. Hedgerows and trees would be removed from this section,</p>	<p>Not significant, with the exception of a localised significant effect over an approximate 550m section from the northern edge of Penny Spot Beck</p>	<p>Short term and reversible in respect of the onshore cable route. Localised significant effects would last for the 2 year construction phase and reduce to not significant</p>

Receptor	Baseline	Sensitivity	Magnitude of Change	Significance of Effect	Duration of Effect
	<p>potential to undergo significant effects occurs between Elsing Road and the River Wensum. The onshore cable route crosses the Wensum Way on Elsing Road and a trenchless drilling compound occurs where the path connects with River Wensum.</p> <p>Elsing Road is a narrow rural road with hedgerows and trees enclosing the northern and southern roadsides, such that views are largely contained. While the hedgerow is almost continuous its condition is poor in parts.</p> <p>Tree cover occurs across the river bank where the trenchless drilling compound would be located. This is a pastoral landscape which avoids the cultivation processes of the surrounding arable fields.</p>	<p>medium.</p> <p>The susceptibility of recreational users of the Wensum Way is influenced by the proximity of the onshore cable route where it crosses Elsing Road and the location of the path along the edge of the trenchless drilling compound where it connects with River Wensum. Susceptibility is medium to high in these parts and reduced along the section of Wensum Way which passes behind Penny Spot Beck plantation from where visibility of the construction works would be screened. The expectation of walkers is typically to enjoy the rural landscape, and the mobilisation area and onshore cable route construction would appear at variance with this.</p>	<p>leaving a gap in the existing cover and opening up views, albeit glimpsed, of the adjacent construction works. The screening of much of the works and the limited extent of hedgerow removal would moderate the effect from Elsing Road.</p> <p>Wensum Way would require diversion in the section adjacent to the trenchless drilling compound next to River Wensum. The magnitude of change would be heightened by the variation in character, whereby this pastoral riverside landscape would be altered by the presence of a large-scale mobilisation area and the associated presence and activity of plant. Replacement planting would infill the gaps post construction although it is anticipated it would take 15 to 20 years for the trees to reach the height of the existing trees, thus giving rise to long term effects.</p>	<p>plantation to the riverside path opposite Old Hall Farm.</p> <p>The remainder and majority of the route would remain defined by the features and characteristics of the baseline landscape.</p>	<p>post-construction. Medium term and reversible in respect of the reinstatement of hedgerows (not significant).</p> <p>Long term and reversible in respect of any tree removals lasting the 30 year indicative design life of the project.</p>
Marriott's Way	<p>Marriott's Way connects Norwich and Aylsham along disused railway lines. It passes into the 1.045km wide study area to the west of Aylsham and follows the south-west alignment of the</p>	<p>The sensitivity of the views of recreational users on Marriott's Way is medium to high.</p> <p>Marriott's Way is a long distance recreational route which connects</p>	<p>The magnitude of change in the section north of Warren Wood would be medium to low. The magnitude of change in the looped section to the west of Reepham</p>	<p>Not significant.</p> <p>In respect of the area to the north of Warren Wood the medium to high sensitivity</p>	<p>Short term and reversible in respect of the onshore cable route construction (not</p>

Receptor	Baseline	Sensitivity	Magnitude of Change	Significance of Effect	Duration of Effect
	<p>cable route over an approximate 13km stretch, before it passes out of the study area to the west of Reepham. Those sections of relevance to this assessment occur to the west of Aylsham and the west of Reepham, where the onshore cable route comes close or intersects the path.</p> <p>To the west of Aylsham, an approximate 400m section of the onshore cable route runs parallel to the north of Marriott's Way. This section is characterised by the surrounding large fields of open arable farmland and the large mixed mature woodland around Warren House to the south. The path is enclosed by mature trees with intermittent gaps allowing views out over scrubby undergrowth.</p> <p>The looped section of Marriott's Way to the west of Reepham is more enclosed by mature tree cover, often dense in parts and with much fewer opportunities to gain visibility of the surrounding arable farmland, which is also slightly more enclosed in this area. The onshore cable route</p>	<p>with NCR 1 near Reepham. The sections of route within the study area are not located within or overlooking any national, regional or local scenic designations or recognised scenic views which might signify heightened value. The value of views from Marriott's Way is medium.</p> <p>The susceptibility of recreational users of this route to the proposed project is influenced by the potential proximity and level of visibility of the onshore cable route and trenchless crossing (e.g. HDD) compounds.</p> <p>In the section to the north of Warren Wood, the cable route would run parallel to Marriott's Way, over an approximate 400m stretch to the immediate north. Although separated by intervening vegetation, open sections would make users of the path more susceptible to the effects of the proposed project.</p> <p>In the looped section to the west of Reepham, the almost continuous enclosure reduces the susceptibility of recreational users as their views of the proposed project would be limited.</p>	<p>would be low.</p> <p>The impact of the onshore cable route construction works to the north of Warren Wood would relate to the presence and activity of plant, and although this would be relatively small in scale, there would be a greater concentration than typically associated with agricultural practices. The works would occur on arable farmland where the magnitude of change would be moderated by the absence of natural vegetation, limited hedgerow enclosure and the ongoing disturbance of the land through cultivation. Furthermore, enclosing vegetation around the path would limit the extent and clarity of the views of path users.</p> <p>The magnitude of change in the looped section to the west of Reepham would be low. This is largely owing to the use of trenchless crossing (e.g. HDD) under these areas to ensure no tree removals would occur. In both locations, mature trees line the path, and the enclosure of these would limit the potential visibility of the adjacent trenchless crossing (e.g. HDD)</p>	<p>combined with the medium to low magnitude of change would lead to a not significant effect. In respect of the two areas to the west of Reepham, the medium to high sensitivity combined with the low magnitude of change would lead to a not significant effect.</p> <p>The remainder of the route would remain unaffected by the project.</p>	<p>significant).</p> <p>Medium term and reversible in respect of the re-instatement of hedgerows (not significant).</p>

Receptor	Baseline	Sensitivity	Magnitude of Change	Significance of Effect	Duration of Effect
	intersects this loop in the north, east of Brick Kiln Farm and in the south, south of Brick Kiln Farm.	The expectations of recreational users of this route would typically be to enjoy the rural landscape and this increases their susceptibility to the construction works, which overall is considered to be medium to high.	compounds in the adjacent fields on either side.		
Paston Way	<p>Paston Way is a long-distance footpath covering 22 miles between Cromer in the north-west with North Walsham in the south-east. At Cromer, it connects with the Norfolk Coast Path or Weaver's Way, the latter forming a 45 mile circular route back to North Walsham.</p> <p>The short section of Paston Way with potential to undergo significant effects occurs on the northern edge of North Walsham, where it follows the dismantled railway north-east towards the coast. This section is characterised by the scale and enclosure of mature tree cover which surrounds the path and prevents views out towards the surrounding urban edge and arable farmland.</p>	<p>The sensitivity of the views of recreational users on Paston Way is medium in the short section where the onshore cable route crosses the path.</p> <p>The section of the Paston Way which occurs in the study area is not covered by any national, regional or local scenic designations or recognised scenic views which might signify heightened value. The value of views from Paston Way is medium.</p> <p>The susceptibility of recreational users of Paston Way is moderated by the use of a trenchless crossing which means the trees enclosing this section of the path would not be disturbed. The susceptibility of walkers is medium to low owing to the enclosure of the tree cover.</p>	<p>The magnitude of change in the section where the onshore cable route intersects the path would be low.</p> <p>The use of trenchless crossing (e.g. HDD) under this section of the Paston Way would ensure that none of the mature tree cover surrounding it would be removed. The existing trees would screen the trenchless crossing (e.g. HDD) compound to the east, located to the north of London Road, thus reducing the magnitude of change to low.</p>	<p>Not significant.</p> <p>The combination of the medium sensitivity with the low magnitude of change would lead to a not significant effect.</p> <p>The remainder of the route would remain unaffected by the project.</p>	<p>Short term and reversible in respect of onshore cable route construction (not significant).</p> <p>Medium term and reversible in respect of the re-instatement of hedgerows (not significant).</p>
Norfolk Coast Cycleway	The Norfolk Coast Cycleway passes through the onshore cable	The sensitivity of the views of cyclists on the Norfolk Coast	The magnitude of change on the views of cyclists would be medium in	Not significant. In respect of the	Short term and reversible in

Receptor	Baseline	Sensitivity	Magnitude of Change	Significance of Effect	Duration of Effect
(Regional Cycle Route 30)	<p>route study area between Happisburgh Common in the east, to west of Ridlington. The cycle route intersects the onshore cable route on Grub Street, the minor road to Hill Sixty and Ridlington Street.</p> <p>The agricultural landscape that provides the context to the North Norfolk Cycleway is gently undulating and open, with mainly arable fields divided by ditches, banks and broken hedgerows and with groups of trees clustered around settlements. The route follows the quieter rural roads through Norfolk, presenting the more rural and less urban aspects of this County. Views are typically close to middle range owing to the cumulative enclosure of hedgerows and tree cover.</p>	<p>Cycleway is medium.</p> <p>Although recognised as part of a wider cycleway network (Norfolk Coast Cycleway) the section of cycleway within the study area is not located within or overlooking any national, regional or local scenic designations or recognised scenic views which might signify heightened value for this location. Value is therefore considered to be medium.</p> <p>The susceptibility of this cycle route to the proposed project is influenced by the proximity and level of visibility of the onshore cable route where it intersects in three locations. The susceptibility is moderated by the reinstatement of lost hedgerows following the completion of construction. The expectation of cyclists using this route is typically to enjoy the rural landscape and this increases their susceptibility to the construction works, which is considered to be medium.</p>	<p>localised sections and low or no effect in remaining sections.</p> <p>Potential changes in the view would occur as a result of the cable route construction activities within open agricultural fields and the potential loss of roadside hedgerows.</p> <p>There would be hedgerow removals where the cable route crosses the cycle route which would be most noticeable in views on approach or whilst passing these 20m to 25m sections. This would occur on the corner between Grub Street and the minor road to Hill Sixty and again on Ridlington Street. The relatively short sections of hedgerow being removed combined with the fact that they would be reinstated post construction, moderates the effect. The construction of the onshore cable route would appear as a relatively small scale operation in a landscape previously disturbed by farming practices.</p>	<p>three crossing points, the combination of the medium sensitivity with the medium magnitude of change would lead to a not significant effect. The remainder of the route would remain unaffected by the project.</p>	<p>respect of onshore cable route construction (not significant). Medium term and reversible in respect of the reinstatement of hedgerows (not significant).</p>
Ridlington / Ridlington	Ridlington and Ridlington Street are small villages located at the	The sensitivity of the views of residents of Ridlington and	The magnitude of change on the views of residents would be	Not significant. The medium	Short term and reversible in

Receptor	Baseline	Sensitivity	Magnitude of Change	Significance of Effect	Duration of Effect
Street	<p>transition between the Coastal Plain and Small Valley LCTs. They are rural villages, with a largely inward-looking pattern and enclosure from tree cover. The onshore cable route would cross 'The Street' to the south of Ridlington and the immediate north of Ridlington Street. While the northern edge of Ridlington Street is enclosed by vegetation, the southern edge of Ridlington is only partially enclosed by tree cover. Open and enclosed sections occur along The Street.</p> <p>A mobilisation area would also be located approximately 500m to the east of Ridlington. There are a small number of properties on the north-eastern side of Ridlington with open views to the east whilst most of the village is enclosed by tree cover or built form.</p>	<p>Ridlington Street is medium.</p> <p>The value of the views from the villages is medium. There are no formal viewpoints and the views are not representative of a designated landscape. There are no special features visible from this section of The Street or the north-east corner of Ridlington and the views from the village are typically introverted.</p> <p>The susceptibility of residents is medium. Views from the settlements are largely enclosed by surrounding vegetation limiting the extent of views towards the surrounding landscape. The exception occurs in the north-east corner where views across the adjacent arable farmland are much more open.</p>	<p>medium.</p> <p>In respect of the onshore cable route, the potential impacts would relate to the presence and activity of the plant required for construction of the trenches and running track and the loss of hedgerows and hedgetrees where it crosses The Street. The extent of visibility would be limited by the enclosure of both settlements by vegetation, and in respect of Ridlington, its greater separation distance from the construction works.</p> <p>In respect of the mobilisation area to the east of Ridlington the potential impact would relate to the presence and activity of this fenced and surfaced compound containing plant, materials, site office and welfare facilities. The compound and its content would form a relatively low-lying feature in the landscape and the separation distance of 500m from the eastern settlement edge, would mean it would appear as a relatively small scale feature in a wider landscape setting.</p>	<p>sensitivity combined with the medium magnitude of change would lead to a not significant effect. The extent of enclosure around these settlements combined with the separation distances from the project would ensure that the effects would not redefine the views of residents.</p>	<p>respect of onshore cable route construction (not significant). Medium term and reversible in respect of the re-instatement of hedgerows (not significant).</p>
North Walsham	<p>Potential views of the cable route construction are restricted to a suburban area of the settlement</p>	<p>The sensitivity of the views of residents on the northern edge of</p>	<p>The magnitude of change on the views of residents would be low. Whilst previously cable trenching</p>	<p>Not significant. The combination of the medium</p>	<p>Short term and reversible in respect of</p>

Receptor	Baseline	Sensitivity	Magnitude of Change	Significance of Effect	Duration of Effect
	<p>between the B1145 and Bacton Road. From this area, the onshore cable route would pass through a field adjacent to the fronts of properties on Mundesley Road and the rears of properties on Swafield Rise. There are a mix of orientations on Wharton Drive and Acorn Road, although with the latter, there is an open aspect towards the north where the construction works would occur, from the hammer head turn for this street. The field is cultivated, and enclosure occurs along the northern boundary with Little London Road.</p> <p>Due to tree, hedgerow and woodland vegetation elsewhere around the edges of the settlement, it would be unlikely that visibility would give rise to potentially significant effects.</p>	<p>North Walsham is medium. North Walsham is not covered by any townscape or landscape designations which would otherwise denote a special value. Much of the settlement is bounded by trees and woodlands which restrict views of the rural landscape beyond.</p> <p>The susceptibility of the views of residents on Mundesley Road would be medium to low as their principal orientation is towards the east, while the construction works would lie to the south. The susceptibility of other residents in this area would be medium as their rear orientation would potentially be affected, albeit from a greater range and with boundary fences forming some enclosure.</p>	<p>was proposed through the field to the immediate north, current proposals show trenchless crossing (e.g. HDD) such that there would be no visible components of the construction works located in this field and no loss of trees or hedgerows along London Road. A trenchless crossing (e.g. HDD) compound would be located in the field to the north of Little London Road approximately 330m from the settlement edge. The separation distance combined with the partial screening of tree cover aligning both sides of London Road, would limit the influence this compound would have on the views of residents. There would be no other views of the construction activities from elsewhere in the settlement.</p>	<p>sensitivity and the low magnitude of change would lead to a not significant effect. This is as a result of the use of trenchless construction in this area.</p>	<p>onshore cable route construction (not significant). Medium term and reversible in respect of the re-instatement of hedgerows (not significant).</p>
Banningham	<p>Banningham is a small ribbon settlement to the north east of Aylsham. It extends along Colby Road from the historic core in the south to the junction with Banningham Hall in the north. The village is largely enclosed with properties on either side</p>	<p>The sensitivity of the views of residents in Banningham is medium. Banningham is not covered by any townscape or landscape designations which would otherwise denote a special value. There are no formal viewpoints and no special features visible in views from this</p>	<p>The magnitude of change on the views of residents would be medium.</p> <p>The onshore cable route construction works would be located to the west of Banningham. The presence and activity of the onshore cable route construction works</p>	<p>Not significant. The combination of the medium sensitivity and the medium magnitude of change would lead to a not</p>	<p>Short term and reversible in respect of onshore cable route construction (not significant). Medium term and</p>

Receptor	Baseline	Sensitivity	Magnitude of Change	Significance of Effect	Duration of Effect
	<p>facing in towards Colby Road. The exception occurs in the northern part where the properties on the eastern side experience an open aspect across the arable farmland to the west, where the construction works would be located. Development is typically small in scale and rural in character, with the historic church, village green and traditional pub adding to the character of the settlement. The surrounding landscape is characterised by arable farmland and although enclosure has been eroded, mature tree cover encloses parts of the village.</p>	<p>area. The value of the views relates to the visual amenity of the surrounding rural landscape and although much of the settlement is inward looking, some parts experience an open aspect. The value is considered to be medium. The susceptibility of residents in Banningham to the proposed project is influenced by the proximity and level of visibility of the onshore cable route construction works, which would be located approximately 250 to 300m from the western settlement edge. The proposed project would have an effect on the visual amenity from properties and garden grounds where the views are currently characterised by open farmland. The susceptibility of residents would be medium to high.</p>	<p>would be evident from the fronts of the properties in the north part of the village and the rears of the properties in the centre and south. The construction works would be sufficiently offset from the western edge of the settlement to reduce the scale and prominence of the works. The construction works would not present an entirely unfamiliar feature in views from these properties although there would be a greater concentration and activity of plant. The effect of the proposed project would be moderated by the separation distance from the settlement edge, and the baseline influence of the cultivated landscape.</p>	<p>significant effect.</p>	<p>reversible in respect of the re-instatement of hedgerows (not significant).</p>
Reepham	<p>The onshore cable route passes to the north of Reepham. Intervening hedgerows and trees that border fields along the northern edge of Reepham restrict views of the wider landscape. Potential views of the onshore cable route construction</p>	<p>The sensitivity of the views of residents to the proposed project is medium. The northern part of the settlement closest to the proposed cable route, is not covered by townscape or landscape designations which would</p>	<p>The magnitude of change on the views of residents would be medium. While the cable route would pass to the rear of properties on the northern edge of Reepham, it is only from this small area of suburban</p>	<p>Not significant. The combination of the medium sensitivity and the medium magnitude of change would</p>	<p>Short term and reversible in respect of onshore cable route construction (not significant). Medium term and</p>

Receptor	Baseline	Sensitivity	Magnitude of Change	Significance of Effect	Duration of Effect
	are therefore restricted to the northern edge of the new housing on Oak Drive and Ash Close adjacent to the B1145. The cable route is routed through the arable farm field to the north of the rear gardens of these properties. Intermittent mature tree cover occurs along the north-east edge while the north-west edge is largely open. The development has been designed to be inward looking with no direct association established with the surrounding landscape context.	<p>otherwise denote a special value. There are no formal viewpoints and no special features visible in views from this area. The value of views from this northern part of the settlement is considered to be medium.</p> <p>The susceptibility of the views of residents to the proposed project is influenced by the visual amenity of their open and rural aspect and the proximity of the properties to the construction works. Their susceptibility is, however, moderated by the extent of screening, especially along the north-east boundary. Taking these factors into account, the susceptibility is considered to be medium.</p>	<p>properties next to the B1145 where the activities associated with the open-cut trenching process would be apparent in views. Views of the construction activities from elsewhere in the settlement would be limited.</p> <p>The onshore cable route construction would occur within the field adjacent to these properties and would be apparent owing to the 45m working width of the onshore cable route and the presence and activity of the associated plant. The cultivated nature of this land means these works would not be an entirely unfamiliar feature, although the concentration of plant would form a more notable feature than typical farm machinery. Although the onshore cable route would be located approximately 50m from the closest settlement edge, the properties are not orientated towards the rural aspect, and screening does occur.</p>	lead to a not significant effect.	reversible in respect of the reinstatement of hedgerows (not significant).
Swanton Morley	Swanton Morley is a small village set on the Dereham Plateau LCU with its south-eastern edge extending into the River Wensum	The sensitivity of the southern edge of the village to the proposed project would be medium .	The magnitude of change on the views of residents would be medium .	Not significant. The combination of the medium sensitivity and	Short term and reversible in respect of onshore cable

Receptor	Baseline	Sensitivity	Magnitude of Change	Significance of Effect	Duration of Effect
	<p>and Tud Tributary Farmland LCU. The onshore cable route would be located close to the southern edge of the village, cutting across Swanton Road and Dereham Road (B1147) to the south of the village. While much of the village is inward looking, the properties along the western end of Dereham Road are orientated south. Properties along Norwich Road, which extends south out of the village towards the onshore cable route, are orientated west and face into mature tree cover.</p>	<p>The value of the views is medium. There are no formal viewpoints and no landscape designations which would otherwise raise the value, which largely reflects the local value of the visual amenity experienced by residents.</p> <p>The susceptibility of residents is medium. The properties along the western end of Dereham Road are orientated south across the farmland where the onshore cable route would be located, albeit with some screening from garden vegetation and two complete field boundaries with mature hedgetrees and a notable separation space between of approximately 400m. The properties along Norfolk Road are enclosed by mature tree cover, although the onshore cable route would come close to the end of this road and during the winter months filtered views would potentially be possible at a range of approximately 120m.</p>	<p>The mobilisation area would be offset a distance of approximately 200m from the closest southern village edge. In respect of the most susceptible residents on Dereham Road, the screening effect of the intervening vegetation combined with the separation distance of 400m would reduce the prominence of the mobilisation area and onshore cable route in their views. While hedgerow loss would occur in the enclosure of the field boundary between the end of Norwich Road and Dereham Road, this would occur behind the more northerly hedgerow which would largely screen this effect from residents. Visibility from Norwich Road would be limited by the enclosure of mature tree cover, and although some views through the vegetation at the southern end would be possible, especially in the winter, the magnitude of change from these properties would be medium to low, owing largely to separation distance and the limited extent of visibility.</p>	<p>medium magnitude of change would lead to a not significant effect.</p>	<p>route construction (not significant). Medium term and reversible in respect of the reinstatement of hedgerows (not significant).</p>

29.7.5.3 Potential impacts during construction - onshore project substation and National Grid substation extension.

137. The onshore project substation would be located to the south-east of the existing Necton National Grid substation. The National Grid substation extension would be located to the west of the Necton National Grid substation and the National Grid overhead line temporary works would be located to the north-east as shown on Figure 29.4.
138. The impact of the HVDC substation during the construction phase would relate principally to the following features of the construction process:
- The effect of the loss of agricultural land owing to the installation of the 20,000m² (200m x 100m) compound and 75,000m² (250m x 300m) onshore project substation.
 - The effect of the loss of existing hedgerows and trees owing to the excavation of the 20m to 25m wide break for the Norfolk Vanguard and Norfolk Boreas onshore cable routes into the onshore project substation, the break for the onshore 400kV cable route and the break along the southern side of the A47 to accommodate the new junction.
 - The effect on landscape character and visual amenity owing to the presence of the surfaced and fenced compound, and the content of plant, materials and welfare facilities.
 - The effect on landscape character and visual amenity owing to the presence of the emerging onshore project substation with electrical infrastructure up to 19m in height for buildings (up to 25m for lightning protection masts) over a 250m x 300m footprint.
 - The effect on landscape character and visual amenity owing to the activity associated with the installation of the compound, onshore project substation, temporary running track and new junction on the A47.
 - The duration of a 24-30 month construction period.
 - The reinstatement of ground at the compound and running track, and reinstatement of hedgerow and trees, at the end of construction.
139. The impact of the National Grid substation extension during the construction phase would relate principally to the following features of the construction process:
- The effect on the loss of agricultural land owing to the installation of the 67,500m² compound and 29,000m² (145m x 200m) substation extension site and 9,250m² (90m x 75m and 50m x 50m) OHL towers.
 - The effect on landscape character and visual amenity owing to the presence of the surfaced and fenced compound, and the content of plant, materials and welfare facilities.

- The effect on landscape character and visual amenity owing to the presence of the emerging substation extension with electrical infrastructure up to 15m in height and temporary towers (45m) and replacement towers (50m).
 - The effect on landscape character and visual amenity owing to the activity associated with the installation of the compound, substation extension, access road and overhead line temporary works.
 - The duration of a 24-30 month construction period.
 - The reinstatement of ground at the compound and running track, and reinstatement of hedgerow and trees, at the end of construction.
140. Table 29.11 shows the detail of the assessment for each receptor. In summary, the effect on the agricultural land and the hedgerows and hedgetrees would be not significant. There would be localised significant effects on landscape character in those parts of the Settled Tributary Farmland LCT – River Wissey Tributary Farmland LCU and Plateau Farmland LCT – Beeston Plateau LCU and Pickenham Plateau LCU, close to the project, but not significant effects on the remaining parts and all other LCUs. In respect of the representative viewpoints, significant effects would arise from a section of Lodge Lane to the immediate south of the site, a very localised section of Ivy Todd Road to the south-west and a section of the A47 to the north. These effects would all occur within 1.2km of the onshore project substation, making them localised. There would be no significant effects on the views of nearby residents at Ivy Todd and Necton.
141. At the end of the construction phase, land over the onshore cable route and running track would be reinstated. Hedgerows would be reinstated in the 20m to 25m sections where they would have been removed for open-cut trenching, but hedgetrees and trees would not be permitted to be replanted in these sections for 6m to 10m either side of the cable ducts owing to restrictions of planting over cables. In respect of the A47 access, the mitigation planting associated with Dudgeon Offshore Wind Farm onshore substation would be largely retained, with any losses in the young woodland belt replaced, such that only the extent across the access opening would remain open.
142. The majority of the effects would therefore relate to the construction works and be medium term, with effects mitigated through reinstatement of the land and hedgerows as far as practicable and permissible. Residual impacts would occur where hedgetrees and trees would have been removed and could not be replaced owing to restrictions over cable easements or at the A47 access. These effects would be long term, but not irreversible, as replanting of hedgerows and trees could take place following decommissioning, with the exception of the small opening in relation to the A47 access.

143. The presence of the onshore project substation and surfaced compound would also have an impact, and this is addressed in the assessment of effects during the operational phase in Table 29.11.

Table 29.11 Potential impacts during construction – onshore project substation and National Grid substation extension

Receptor	Baseline	Sensitivity	Magnitude of Change	Significance of Effect	Duration of Effect
Onshore project substation and National Grid substation extension – Landscape Receptors					
Agricultural land	<p>The onshore project substation and National Grid substation extension would be located in an area of arable farmland to the south of the A47. The fields where the onshore project substation would be located are medium in size. While hedgerow loss and field amalgamation are evident, localised enclosure is provided by Necton Wood to the north and vegetation associated with Lodge Farm to the south. The fields where the National Grid substation extension would be located are larger in size and with less enclosure. Agricultural land has already been lost to the recent development of Necton National Grid substation and Dudgeon substation, which are located in this area to the south of the A47.</p> <p>The arable farmland comprises single species crops in a landscape that has been modified from its natural state and which is intensively managed. The agricultural land contributes to</p>	<p>The sensitivity of the agricultural land is medium to low.</p> <p>The value of the agricultural land is medium to low. Agricultural land occurs extensively across this landscape and therefore has little scarcity value.</p> <p>The susceptibility of the agricultural land to the construction works is limited as there is no natural vegetation, and the land is already modified by cultivation and presents a highly managed landscape. Furthermore, the agricultural land would be fully reinstated post construction for the areas associated with the mobilisation areas, albeit with areas lost longer term where the operational onshore project substation and National Grid substation extension would be located.</p>	<p>The magnitude of change on the agricultural land would be medium.</p> <p>A sizable area of agricultural land would be lost over the medium term, where the mobilisation areas and running tracks would be located, and over the longer term, where the onshore project substation and National Grid substation extension would be located. The medium term losses would be reinstated post construction and the agricultural land brought back into productivity. The long term losses associated with the operational parts of the project would be reinstated post decommissioning. Collectively, the agricultural land lost over the medium term and long term constitutes only a small proportion of the wider agricultural area and the abundance of this landscape element moderates the magnitude of change. The agricultural land being lost has no special qualities or characteristics as a landscape element and has been modified from its natural state by intensive arable agricultural practices.</p>	<p>Not significant.</p> <p>The combination of the medium to low sensitivity and the medium magnitude of change would lead to a not significant effect.</p>	<p>Medium term and reversible.</p> <p>Long term and reversible.</p> <p>30 month construction period.</p>

Receptor	Baseline	Sensitivity	Magnitude of Change	Significance of Effect	Duration of Effect
	the rural character that typifies the Norfolk landscape.				
Hedgerows	<p>In respect of the onshore project substation, the main hedgerows occur to the immediate south and within the northern and eastern sections of the site. The western hedgerow would remain largely complete. The eastern hedgerow would be completely removed, and the eastern half of the northern hedgerow and parts of the southern hedgerow would be lost. The western and southern hedgerows appear well established, mature and complete, with many hedgetrees occurring in both. The eastern and northern hedgerows are less substantial and do not contribute the same level of enclosure.</p> <p>In respect of the National Grid substation extension there are few existing hedgerows in this area and the only one that would be affected follows the field boundary to the south-east of the existing Necton National Grid substation.</p> <p>Further small sections of hedgerows would be lost where</p>	<p>The sensitivity of the hedgerows is medium to high. Their value is medium to high as they are of importance to the historic pattern of the landscape and the character of enclosure that typifies this rural landscape.</p> <p>The susceptibility of hedgerows to the proposed project is medium. While hedgerow loss is a baseline feature of this local area, they are more abundant in the surrounding rural area. The hedgerows would be fully reinstated post construction for the areas associated with construction and post decommissioning for the onshore project substation site. Trees would not be permitted to be planted over the permanent easements of the onshore cables and onshore 400kV cable route.</p>	<p>The magnitude of change as a result of the removal of hedgerows would be medium to low.</p> <p>The more substantial hedgerow to the west of the onshore project substation would be largely retained. The less substantial hedgerow to the north would be lost in part and to the east lost in full. As these would be located where the onshore project substation would be constructed they would be lost long term and only reinstated following decommissioning. A 13m section of the more substantial hedgerow to the south would be lost during construction of the onshore 400kV cable route but would be reinstated post construction.</p> <p>Hedgerow re-establishment would take 3-5 years post construction to infill gaps made by removals. Planting over cable easements would be restricted to hedgerow planting, because replacement of trees would not be permitted in these areas.</p>	<p>Not significant.</p> <p>The combination of the medium to low sensitivity and the medium magnitude of change would lead to a not significant effect. While the gaps created in the medium term as a result of the construction works would be notable, the limited extents being removed, and their reinstatement post construction would moderate this effect.</p>	<p>Medium term and reversible for hedgerow loss. Hedgerow re-instatement would take 3-5 years.</p>

Receptor	Baseline	Sensitivity	Magnitude of Change	Significance of Effect	Duration of Effect
	trenching would take place to accommodate the 400kV cable route between these two developments and where access would be drawn to the onshore project substation.				
Plateau Farmland LCT – Pickenham Plateau LCU	The National Grid substation extension construction would be located in the Pickenham Plateau LCU. This LCU covers an extensive plateau area extending across the north-west of the study area. The National Grid substation extension would occur in the southern most ‘spur’ which lies to the immediate west of the narrow River Wissey Tributary Farmland. This spur forms a relatively level area of land which has been utilised for the development of Necton National Grid substation and Dudgeon substation. The overhead line extends along this spur to the north-west. The LCU is characterised by large fields of arable with limited enclosure. The A47 has a localised influence on the southern part of the spur, despite the enclosure of tree cover. The construction of the onshore project substation would	The sensitivity of this LCU to the project construction is medium . The value of the LCU is medium – it is not covered by any landscape designations which might otherwise denote a special value. The landscape has been modified by agricultural practices and hedgerow loss has eroded the historic pattern of enclosure. The susceptibility of the LCU to the construction works is medium. Although the National Grid substation extension construction would be located in this LCU, it would occupy only a localised part of the much wider LCU. The susceptibility is moderated by the modified nature of the farmland and there is also an existing influence from the Necton National Grid	The magnitude of change would be high within the local area, medium within the surrounding area and low or no effect across the wider LCU. While Necton National Grid substation and Dudgeon substation already have a notable influence on this LCU, the construction of the National Grid substation extension would increase the influence of large scale energy developments in this part of the LCU, thus detracting from the strength of the underlying rural character. The landscape character would be affected by the presence and activity of the plant, the scale of the mobilisation areas and sites, the earthworks required to create a level platform, and the emergence of electrical infrastructure on the site. The onshore project substation, located in the adjacent LCU, would add indirectly to the effects on the Pickenham Plateau LCU by creating a context in which energy developments would be seen to spread into the wider landscape.	Not significant with the exception of a localised significant effect in the area of the spur. The combination of the medium sensitivity and the high magnitude of change would lead to localised significant effects. Tree cover along the A47 would limit the northern influence of this landscape effect.	Medium term and reversible in respect of onshore project substation construction. Localised significant effects would last for the 30 month construction phase and reduce to not significant post-construction. Medium term and reversible in respect of hedgerow re-establishment (not significant).

Receptor	Baseline	Sensitivity	Magnitude of Change	Significance of Effect	Duration of Effect
	occur concurrently in the River Wissey LCU to the east and this would have an indirect influence on the character of the Pickenham Plateau.	substation, Dudgeon substation, and associated overhead lines.			
Settled Tributary Farmland LCT – River Wissey Tributary Farmland LCU	The onshore project substation construction would be located in the River Wissey Tributary Farmland LCU and the National Grid substation construction would be located in the adjacent Pickenham Plateau LCU to the west. The landform of the local area is typical of the wider LCU with the valley sides sloping down towards the unnamed river course. The onshore project substation would be located on the upper slopes adjacent to the Beeston Plateau LCU to the east. The land use is predominantly arable farmland with a pattern of enclosure which has been eroded owing to the intensification of farming practices. Views are generally medium range, contained within the wider valley with some closer range enclosure where mature woodland and hedgerows occur. Necton National Grid substation and	The sensitivity of this LCU to the project construction is medium . The value of the LCU is medium – it is not covered by any landscape designations which might otherwise denote a special value. The landscape has been modified by agricultural practices and hedgerow loss has eroded the historic pattern of enclosure. The susceptibility of the LCU to the construction works is medium. Although the onshore project substation construction would be located in this LCU, it would occupy only a localised part of the much wider LCU. The susceptibility is also moderated by the modification this landscape has undergone through the practices of intensive farming and there is an existing	The magnitude of change would be high within the local area, medium within the surrounding area and low or no effect across the wider LCU. While Necton National Grid substation and Dudgeon substation already have a notable influence on this part of the LCU, the onshore project substation and National Grid substation extension would add further to the influence of large scale energy developments, thus detracting from the strength of the underlying rural character. The landscape character would be affected by the presence and activity of the plant, the scale of the mobilisation areas and sites, the earthworks required to create a level platform, and the emergence of development on the site. The scale of the construction cranes and the scale and mass of the emerging HVDC buildings would appear at variance with the scale and character of the rural landscape. The National Grid substation extension, located in the adjacent LCU, would add indirectly to the effects on the River Wissey LCU by creating a context in which energy developments would be seen to increase	Not significant with the exception of a localised significant effect in the area extending to the A47 to the north, Great Wood and Smuggler’s Lane to the east, Necton National Grid Substation and the Necton ridgeline to the west and Ivy Todd Road to the south. The combination of the medium sensitivity and high magnitude of change would lead to a significant effect.	Medium term and reversible in respect of onshore project substation construction. Localised significant effects would last for the 30 month construction phase and reduce to not significant post-construction. Medium term and reversible in respect of hedgerow re-establishment (not significant).

Receptor	Baseline	Sensitivity	Magnitude of Change	Significance of Effect	Duration of Effect
	Dudgeon substation are baseline features on the spur of the Pickenham Plateau LCU to the north-west of the onshore project substation.	influence from the Necton National Grid substation, Dudgeon substation and associated overhead lines.	within the wider landscape.		
Plateau Farmland LCT – Beeston Plateau	The onshore project substation would be located immediately adjacent to a small southern spur of the Beeston Plateau LCU. The distinction between the LCUs in this transitional area is subtle, with the landform rounding off from the steeper valley into the flatter plateau. The land use is similarly arable farmland and enclosure is partly eroded causing larger field patterns. This local area is characterised by the mature Necton Wood in the adjoining River Wissey Tributary Farmland LCU and other blocks in the Beeston Plateau LCU to the north and south. The mobilisation area for the onshore project substation would be located in the spur of the LCU while the onshore project substation would be located in the adjacent Tributary Farmland LCU to the west and the National Grid substation extension in the	The sensitivity of this LCU to the onshore project substation construction is medium . The value of the LCU is medium – it is not covered by any landscape designations which would otherwise denote a special value. The landscape has been modified by agricultural practices and although some hedgerow loss has occurred, the broad pattern of enclosure has remained intact. The susceptibility of the LCU to the construction works is medium. Although the mobilisation area would be located in this LCU, it would occupy only a localised part of the much wider LCU. The susceptibility is also moderated by the modification this landscape has undergone through the practices of intensive farming	The magnitude of change would be high within the local area, medium within the surrounding area and low or no effect across the wider LCU. Despite the existing influence of Necton National Grid substation and Dudgeon substation, the location of the mobilisation area in this LCU and the onshore project substation site immediately adjacent, would give rise to direct and indirect effects on local landscape character. The presence and activity of the plant, the scale of the mobilisation area and onshore project substation site, and the emergence of the development would appear at variance with the baseline rural character and scale of the landscape. The use of tall cranes and the emergence of the large scale HVDC halls would give rise to notable effects. Although the National Grid substation extension would lie almost 1km to the north-west, the large scale of this extended development would increase the wider influence of energy developments on this LCU.	Not significant with the exception of a localised significant effect in the area extending to the A47 to the north, Great Wood and Smuggler’s Lane to the east, and the LCU boundary to the west and south. The combination of the medium sensitivity and high magnitude of change would lead to a significant effect.	Medium term and reversible in respect of onshore project substation construction. Localised significant effects would last for the 30 month construction phase and reduce to not significant post-construction. Medium term and reversible in respect of hedgerow re-establishment (not significant).

Receptor	Baseline	Sensitivity	Magnitude of Change	Significance of Effect	Duration of Effect
	Pickenham Plateau LCU further north-west.	and there is a baseline influence from the existing Necton National Grid substation, Dudgeon substation and associated overhead lines.			
Onshore project substation – Visual Receptors					
VP1 Ivy Todd Road west	This viewpoint is located on Ivy Todd Road, midway between the village of Necton and the hamlet of Ivy Todd at a point where a gated access track leads north through the adjacent farmland. The view is intended to be representative of the views of road-users, although the road is enclosed by mature hedgerows along much of its length, such that views are largely contained. This field access provides one of the few glimpsed views towards the site. Located on a localised high point, the landform falls away to the north-east where the onshore project substation site would be located. Although Necton National Grid substation and Dudgeon substation are not visible from this viewpoint, the overhead line is evident along the	<p>The sensitivity of road-users on this minor road would be medium.</p> <p>The value of the view would be medium. The view is not from a formal viewpoint and is not representative of any designated landscapes.</p> <p>The susceptibility of road-users would be medium. While much of the road is enclosed by hedgerow, the alignment of this opening means that east-bound road-users would experience this view, albeit for a very short duration. In winter months, filtered views through the hedgerow may be experienced although only the outline of the construction works associated with the onshore project substation would be</p>	<p>The magnitude of change would be medium to high.</p> <p>The construction works associated with the onshore project substation would form a prominent feature in the view and while some ground level works would be screened by distant hedgerows, the remainder of the works would be readily apparent. The most notable feature would be the emergence of the electrical infrastructure, especially the HVDC halls and the tall cranes used for their construction. These would be evident owing to their large scale and modern character relative to the predominantly open and rural context. Construction lighting would add to the prominence of the project in winter months when working days would extend into hours of darkness. The extent of the medium to high magnitude of change would be contained within the very short section of road from which this open view would be experienced. From the remainder of the road between Necton and Ivy Todd the</p>	<p>Significant within the short section of road from which this open view would be experienced. The combination of the medium sensitivity and medium to high magnitude of change would lead to a significant effect. Views from the remainder of Ivy Todd Road between Necton and Ivy Todd would be not significant, unless roadside hedgerows were</p>	<p>Medium term and reversible in respect of onshore project substation construction. Localised significant effects would last for the 30 month construction phase and reduce to not significant post-construction.</p>

Receptor	Baseline	Sensitivity	Magnitude of Change	Significance of Effect	Duration of Effect
	skyline to the north.	visible. Greater visibility may arise from the more elevated section around the viewpoint if the intervening hedgerow were cut low. The National Grid substation extension would not be readily visible from this viewpoint owing to intervening landform and vegetation.	magnitude of change would be low, despite the fact that filtered views may be experienced during the winter months. This could increase to medium or medium to high in elevated sections if the roadside hedgerows were cut low.	removed or cut low by landowners or other parties in which case the significant effect would extend further.	
VP2 Lodge Lane south	This viewpoint is located at the southern end of Lodge Lane to the north of the hamlet of Ivy Todd. It is not a PRoW but is shown on OS mapping as a route with public access. The view looks north-east across the arable farmland towards the onshore project substation at a range of approximately 610m. The view is representative of the views of walkers in this area and features Necton National Grid substation and Dudgeon substation which, along with the associated overhead line, forms readily apparent development along the skyline to the north-west. The view is contained in the middle range by the subtle relief of the landform and enclosure of	The sensitivity of walkers and users of Lodge Lane would be medium . The value of the views of walkers is medium. The view is not from a formal viewpoint and does not look onto any landscape designations. The existing Necton National Grid substation, Dudgeon substation and overhead line are evident, and these make large scale electricity developments a feature of the baseline views from Lodge Lane. The susceptibility of walkers is medium. Access on the lane provides only a short walk as it does not connect with the	The magnitude of change would be high along the southern section of Lodge Lane for approximately 550m. The construction of the onshore project substation would form a prominent feature, seen approximately 610m from the viewpoint and set along part of the containing skyline of the view. Intervening hedgerows and tree cover would provide some screening, especially of the ground level construction works, although larger plant and the emergence of the electrical infrastructure and HVDC converter halls, would be readily apparent along the skyline. The horizontal spread of the construction works would extend beyond the mature trees to the right of centre, although the intervening mature trees would provide some screening. Construction lighting would add to the prominence of the project in winter months when working days would	Significant along the southern section of Lodge Lane for approximately 550m. The combination of the medium sensitivity and the high magnitude of change would lead to a significant effect.	Medium term and reversible in respect of onshore project substation construction. Localised significant effects would last for the 30 month construction phase and reduce to not significant post-construction.

Receptor	Baseline	Sensitivity	Magnitude of Change	Significance of Effect	Duration of Effect
	hedgerows. Hedgerows and tree cover are depleted within the farmland but more substantial around Ivy Todd to the south.	wider PRoW network. While the experience of walkers is already influenced by the existing electricity developments, the onshore project substation would be notably closer.	extend into hours of darkness. The magnitude of change would be high for much of the length of Lodge Lane owing to the relatively open views. The construction of the National Grid substation extension would not add to the magnitude of change, owing to its location behind the existing National Grid and Dudgeon Substations. These existing developments would largely screen the construction of the new extension and therefore, reduce its influence on the views of walkers on Lodge Lane. The additional transmission tower would form an additional visible feature, although this effect would be moderated by the presence of similar sized towers in the baseline context.		
VP3 Lodge lane north	This viewpoint is located at the northern end of Lodge Lane to the north of the hamlet of Ivy Todd. It is not a PRoW but is shown on OS mapping as a route with public access. The view looks north towards the mature tree cover that encloses Lodge Farm and north-west towards the Necton National Grid substation and Dudgeon substation. The view looks across the arable farmland towards the onshore project substation at a range of	The sensitivity of walkers on Lodge Lane would be medium . The value of the view is medium. The view is not from a formal viewpoint and does not look onto any landscape designations. The existing Necton National Grid substation and overhead line are evident, and these make large scale electricity developments a feature of the baseline views from Lodge	The magnitude of change as a result of the project construction would be medium . Despite the closer range of this viewpoint, at approximately 400m, compared to 610m for Viewpoint 2, there would be less visibility of the construction works associated with the onshore project substation owing to the closer proximity of the intervening vegetation. The trees which enclose Lodge Farm would screen most of the construction works, with only construction cranes and some of the taller components visible at the left side where the hedgerow and hedgetrees provide lower and more broken	Significant in the northern section of Lodge Lane for approximately 250m. The combination of the medium sensitivity and the medium magnitude of change would lead to a significant effect.	Medium term and reversible in respect of onshore project substation construction. Localised significant effects would last for the 30 month construction phase and

Receptor	Baseline	Sensitivity	Magnitude of Change	Significance of Effect	Duration of Effect
	<p>approximately 330m. The view is representative of the views of walkers in this area and features Necton National Grid substation and Dudgeon substation which, along with the associated overhead line, forms readily apparent development along the skyline. The view is contained in the middle range by the subtle relief of the landform and enclosure of hedgerows. Hedgerows and tree cover are depleted within the farmland but more substantial around Ivy Todd to the south.</p>	<p>Lane.</p> <p>The susceptibility of walkers is medium. Access on the lane provides only a short walk as it does not connect with the wider PRoW network. As the lane approaches Lodge Farm, visibility of the onshore project substation and the National Grid substation extension would become increasingly screened by intervening vegetation. The experience of walkers closer to the viewpoint is already influenced by the existing electricity developments although this viewpoint would be close to the onshore project substation.</p>	<p>cover. Glimpsed views of the masts and parts of the converter hall would occur, although the similarity between the masts and the existing towers of the overhead line would reduce the magnitude of change.</p> <p>The construction of the National Grid substation extension would not increase the magnitude of change, owing to its location behind the existing National Grid and Dudgeon substations. These existing developments would largely screen the construction of the new extension and therefore, reduce its influence on the views of walkers on Lodge Lane.</p>		<p>reduce to not significant post-construction.</p>
VP4 A47 Necton Substation	<p>This viewpoint is located at the access from the A47 into Necton National Grid substation. It represents the views of road-users on the A47, which are filtered by bare trees in the winter and screened by leafed trees in the summer. While there are some more open sections, substantial mitigation planting associated with Dudgeon onshore</p>	<p>The sensitivity of road-users on this section of the A47 is medium.</p> <p>The value of the views from the A47 is medium. The A47 is not a 'scenic route' and this section does not pass through any landscape designations. There are no formal viewpoints and nearby laybys are largely enclosed by tree</p>	<p>The magnitude of change from the adjacent sections of the A47 would be medium.</p> <p>There would be a limited effect in respect of the construction of the onshore project substation as it would be located below the level of the intervening landform, with the exception of tall cranes used in the construction of the HVDC converter halls which may be visible. The construction of the National Grid substation extension would be more readily visible, with the</p>	<p>Significant in the section adjacent to the proposed project for approximately 250m. The combination of the medium sensitivity and the medium magnitude of</p>	<p>Medium term and reversible in respect of onshore project substation construction. Localised significant effects would last for the 30</p>

Receptor	Baseline	Sensitivity	Magnitude of Change	Significance of Effect	Duration of Effect
	works will add further to the screening effect over time. The access provides a view that at most would be glimpsed by passing road-users travelling at speed. The electrical infrastructure associated with Necton National Grid substation forms the characterising feature in this view. It appears at variance with the rural character of the surrounding landscape and establishes energy developments as a feature of the baseline view.	cover. The susceptibility of road-users to the effects of the project is medium. From this viewpoint, while the onshore project substation would be largely screened by intervening landform and the Necton National Grid substation, the National Grid substation extension would be close in range. From adjacent parts of the A47, tree cover encloses most of the views, although views may occur at this access and through other gaps and this raises the susceptibility.	extension seen to the fore of the Necton National Grid Substation and the mobilisation area adjacent to the A47. While the construction cranes and other large plant would be evident, the baseline character of this site as an established energy development, combined with the presence of the larger scale overhead line towers, would moderate the overall effect. Nonetheless, the proximity of the works to the road combined with the occurrence of gaps and filtered views through, especially during the winter months, would give rise to a notable effect on the views of road-users. Construction lighting would add to the prominence of the project in winter months when working days would extend into hours of darkness. Furthermore, the proximity of the additional transmission tower to this section of the A47 would add to the overall effect during the construction phase.	change would lead to a localised significant effect. Effects further west on the A47 would be not significant . Effects further east are assessed under Viewpoint 5 and Viewpoint 6 below.	month construction phase and reduce to not significant post-construction.
VP5 A47 Spicer's Corner	This viewpoint is located opposite Spicer's Corner layby on the A47. It represents the views of road-users on the A47 which are filtered by bare trees in the winter and screened by leafed trees in the summer. While there are some gaps in the vegetation where views over the adjacent landscape can be experienced,	The sensitivity of road-users on this section of the A47 is medium to high . The value of the views from the A47 is medium. The A47 is not a 'scenic route' and this section does not pass through any landscape designations. There are no formal viewpoints and nearby laybys	The magnitude of change from the adjacent section of the A47 would be medium to high . The existing enclosure experienced in this section of the A47 would be altered by the removal of a 300m section of the existing vegetation along the southern road-side to accommodate the road widening for a turning lane into the site access from the A47. While this would remove the taller and	Significant over the approximate 300m section where vegetation removals would occur. The combination of the medium to high sensitivity and the medium	Medium term and reversible in respect of onshore project substation construction. Localised significant effects would

Receptor	Baseline	Sensitivity	Magnitude of Change	Significance of Effect	Duration of Effect
	mitigation planting associated with Dudgeon onshore works will add further to the screening effect over time. The opening and other gaps in the tree cover provide views that would be experienced by passing road-users travelling at speed. The view is of arable farmland with hedgerow and woodland enclosure and expansive in extent owing to the higher elevation than the other viewpoints. Existing Necton National Grid substation and Dudgeon substation are readily apparent in this view, but not always apparent in the views of road-users on the adjacent section of the A47.	are largely enclosed by tree cover. The susceptibility of road-users to the effects of the onshore project substation construction is medium to high. While currently from this viewpoint, the view is fleeting and from adjacent parts of the A47, tree cover encloses most of the views, the introduction of the new A47 junction would require the removal of a substantial section of the existing tree cover on the southern side of the road and this would open up the view and raise the susceptibility of road-users.	older vegetation by the road-side, the smaller and younger vegetation, planted as part of the mitigation works associated with Dudgeon Substation, would be largely retained apart from over the approximate 20m section where the access from the A47 would be taken. These removals would open up visibility of the construction works from the A47, and although at a range of 1.1km and located perpendicular to the direction of travel, the presence and activity of the plant, especially the use of tall cranes, coupled with the emergence of the converter halls, and the use of construction lighting would create a new focus that would appear at variance with the small scale and rural character of the landscape. The construction of the National Grid substation extension and overhead line modification works would also be visible from this viewpoint, although seen as an expansion of existing features rather than the introduction of new features. The two sites of construction work, in separate locations, albeit the same sector of the view, would add to the magnitude of change by increasing the extent of influence.	to high magnitude of change would lead to a significant effect. Effects to the immediate west on the A47 would be not significant . Effects further west are assessed under Viewpoint 4 and effects further east assessed under Viewpoint 6.	last for the 30 month construction phase and reduce to not significant post-construction.
VP6 A47 Top Farm	This viewpoint is located west of the layby on the A47 to the west of the access road to Top Farm. It represents the views of road-	The sensitivity of road-users on this section of the A47 is medium . The value of the views from	The magnitude of change from the adjacent sections of the A47 would be medium . Glimpsed views would occur as road-users pass gaps in the roadside vegetation,	Not significant . The combination of the medium sensitivity and the	Medium term and reversible in respect of the temporary

Receptor	Baseline	Sensitivity	Magnitude of Change	Significance of Effect	Duration of Effect
	users on the A47 which are filtered by bare trees in the winter and screened by leafed trees in the summer. While there are some gaps in the tree cover, mitigation planting associated with Dudgeon would add further to the screening effect over time. This viewpoint represents views that would be experienced by passing road-users travelling at speed. The view is of arable farmland with hedgerow and woodland enclosure and expansive in extent owing to its relatively high elevation. Existing Necton National Grid substation and Dudgeon substation are readily apparent in this view, but not apparent in the views of road-users on the adjacent section of the A47.	<p>the A47 is medium. The A47 is not a 'scenic route' and this section does not pass through any landscape designations. There are no formal viewpoints and nearby laybys are largely screened by tree cover.</p> <p>The susceptibility of road-users to the effects of the onshore project substation construction is medium. While roadside vegetation aligns the road between the layby and Viewpoint 5, it is thin and fragmented in parts and views through to the adjacent landscape occur, albeit fleeting and experienced whilst in transit at high speeds.</p>	<p>although these would be short in duration and at an oblique angle to the direction of travel. Filtered and glimpsed views would potentially alter the experience of road-users, by revealing a large-scale construction site with the presence and activity of plant and the emergence of electrical infrastructure, albeit into an area, already influenced by the presence of the overhead line. The use of construction lighting would add to the prominence of the project albeit with the intensity reduced by the separation from the A47.</p> <p>Construction works associated with the National Grid substation extension and overhead line modification works would be largely concealed by intervening vegetation from this section of the A47.</p>	medium magnitude of change would lead to a not significant effect. The extent to which the onshore project substation construction would be screened by intervening tree cover would notably reduce its visual influence.	construction works (30 months).
VP7 Ivy Todd Road east	This viewpoint is located on Ivy Todd Road, midway between the hamlet of Ivy Todd and the cluster of properties around Willow Farm, along a section which is largely unenclosed to the north. The view is representative of the views of road-users, along this open section of approximately	<p>The sensitivity of road-users on this minor road would be medium.</p> <p>The value of the view would be medium. The view is not from a formal viewpoint and does not look onto any landscape designations.</p> <p>The susceptibility of road-</p>	<p>The magnitude of change would be medium to low.</p> <p>The hedgerows and hedgetrees on the field boundary would largely screen the construction works associated with the onshore project substation. Only a limited horizontal extent of the construction site would be visible owing to the screening effect of the denser vegetation, and the</p>	Not significant. The combination of the medium sensitivity and the medium to low magnitude of change would lead to a not significant effect.	Medium term and reversible in respect of the temporary construction works (30 months).

Receptor	Baseline	Sensitivity	Magnitude of Change	Significance of Effect	Duration of Effect
	200m. The road to the west is enclosed by hedge banks and to the east by hedgerow and tree cover. Located on a localised high point next to Vale House access, the landform falls away to the north-west where the onshore project substation construction works would be located. The existing Necton National Grid substation and Dudgeon substation are not readily apparent in this view, while the overhead line is visible along the skyline to the north.	users would be medium. While much of the road is enclosed by hedgerow, this section opens up the view, although still contained within the close range by the field boundary to the north, behind which the onshore project substation construction works would be located.	vertical extent would be reduced by the setting of the emerging onshore project substation partly below the ridgeline. Visibility would be partly filtered by intervening trees. Despite the limited visibility, it would be evident as an emerging development, especially owing to the use of tall cranes and the use of construction lighting in winter months, and this would alter the character of the rural view.	The extent to which the onshore project substation would be screened by intervening tree cover would notably reduce its visual influence.	
VP8 Chapel Road, Necton	This viewpoint is located on the south-east edge of Necton and is representative of the views of residents along this edge. The properties along Chapel Road are orientated west, such that their rear elevations and gardens are orientated north-east towards the onshore project substation site with the National Grid substation extension located to the north. The adjacent farmland is characterised by large arable fields with intermittent hedgerow enclosure. The view is contained within the close range by the	The sensitivity of residents to the proposed project would be medium to high . The value of the view would be medium to high. The view is not taken from a formal viewpoint and is not representative of any landscape designations. The value relates to the visual amenity of residents on this eastern side of the settlement. The susceptibility of residents to the construction of the onshore project substation is medium. The rears of the	The magnitude of change would be medium to low . The majority of the construction works would be screened by intervening landform, such that the presence and activity of much of the plant would not be readily visible from the eastern edge of Necton. The visualisation in Figure 29.20c shows how only the tips of the lightning protection masts would possibly be visible along the skyline. There is the potential that the tall cranes used for the construction of the HVDC converter halls would be visible and that from more elevated properties to the north-west and upper floors, higher parts of the construction works may be visible beyond the intervening	Not significant. The combination of the medium sensitivity and the medium to low magnitude of change would lead to a not significant effect.	Medium term and reversible in respect of the temporary construction works (30 months).

Receptor	Baseline	Sensitivity	Magnitude of Change	Significance of Effect	Duration of Effect
	convex landform with overhead line towers and trees forming apparent vertical features along the skyline. The existing Necton National Grid substation and Dudgeon substation are not readily apparent in this view.	properties are orientated towards the site and although intervening landform, boundary fences and garden vegetation would largely screen the construction works, higher elements would be visible, most notably tall cranes, especially from upper floors, and this raises susceptibility.	hedge. The limited extent of visibility combined with the separation distance of 1.4km would moderate the effect and ensure that it would not give rise to a notable effect.		
VP9 St Andrews Lane, Necton	St Andrews Lane forms an arc around the north-east edge of Necton, connecting Tuns Road, close to the A47, with the Chapel Road junction, where Viewpoint 8 is located. Whilst there is residential development at both these ends, and a cluster of developments to the south of the road in the middle, the majority of the roadside is undeveloped. At the southern end the properties are mostly two-storey and semi-detached with some bungalows at the top end of the street. The middle section is enclosed by mature and continuous hedgerow on either side, with openings to the east only for farm access, and	The sensitivity of residents to the proposed project would be medium to high . The value of the view would be medium to high. The view is not taken from a formal viewpoint and is not representative of any landscape designations. The value relates to the visual amenity of residents on this eastern side of the settlement. The susceptibility of residents to the construction of the onshore project substation is medium. The rears of the properties are orientated towards the site and although	The magnitude of change would be medium to low . The majority of the construction works would be screened by intervening landform, such that the presence and activity of much of the plant would not be readily visible from the eastern edge of Necton. The visualisation in Figure 29.21c shows how only the top of the National Grid substation extension would be visible above the skyline. There is the potential that the tall cranes used for construction would be visible and that from the more elevated properties and upper floors, higher parts of the construction works would be visible beyond the intervening hedge. The limited extent of visibility would moderate the effect and ensure that it would not give rise to a notable effect.	Not significant. The combination of the medium to high sensitivity and the medium to low magnitude of change would lead to a not significant effect.	Medium term and reversible in respect of the temporary construction works (30 months).

Receptor	Baseline	Sensitivity	Magnitude of Change	Significance of Effect	Duration of Effect
	<p>to the west where access to the Rectory and Necton Grange Care Home occurs. These properties are largely enclosed by garden vegetation. Further north, the eastern side of the road opens up and the views of road-users extend across the adjacent arable farmland. While Dudgeon and Necton Substations are not readily apparent, transmission towers can be seen along the skyline. The small group of bungalows at the northern end face onto the street and are largely enclosed by garden vegetation.</p> <p>The level of the road is low at either end and rises in the middle. The viewpoint is located at the high point where the first farm field opening occurs, from where the overhead line is visible along with the top of the Dudgeon Substation.</p>	<p>intervening landform, boundary fences and garden vegetation would largely screen the construction works, higher elements would be visible, most notably tall cranes, especially from upper floors, and this raises susceptibility.</p>			
VP10 Holme Hale	<p>Holme Hale is a small village located approximately 2km to the south-east of Necton. It is essentially a linear settlement, set across rising landform from north to south, with properties mostly</p>	<p>The sensitivity of residents and road-users to the proposed project would be medium to low.</p> <p>The value of the view would be medium. The view is not</p>	<p>The magnitude of change for residents would be low and for road-users would be medium to low.</p> <p>The separation distance of approximately 3.4km to the National Grid substation extension and approximately 3.3km to the</p>	<p>Not significant.</p> <p>The combination of the medium to low sensitivity and the medium to low magnitude of</p>	<p>Medium term and reversible in respect of the temporary construction works (30</p>

Receptor	Baseline	Sensitivity	Magnitude of Change	Significance of Effect	Duration of Effect
	inward looking and enclosure afforded by surrounding tree cover. The representative viewpoint is located on Station Road to the south-east of the Hamlet, where the landform is more elevated. The view extends from this ridge over the valley of the River Wissey to the spur of subtly elevated land where the overhead line forms a readily visible feature along the skyline. Dudgeon and Necton substations form a small scale and distant feature partly concealed by intervening tree cover. The view is otherwise typically rural with a predominance of arable farmland and small interspersed settlements.	taken from a formal viewpoint and is not representative of any landscape designations. The susceptibility of residents to the construction of the proposed project is low. Views from the village are largely contained by the enclosure of built form and tree cover. The susceptibility of road-users on Station Road is medium to low. The elevated location and relatively open aspect means that views potentially extend to both the National Grid substation extension and onshore project substation, albeit at an oblique angle to the direction of travel.	onshore project substation construction works would limit the scale of the visible parts of the project, such that they would appear relatively small, especially seen within the wider panorama of the view. The National Grid substation extension would be set behind Dudgeon and Necton substations, such that its construction would be largely screened, although tall cranes and the construction of the additional transmission tower would still form readily apparent features. Parts of the onshore project substation, as it emerged during the construction phase, would be visible between the trees and again, the tall cranes would draw further attention to this site. Whilst these features would appear at variance with the rural character experienced by road-users, the visual effect of the project would be moderated by the separation distance and the partial screening from woodland and existing developments.	change experienced by road-users would lead to a not significant effect. The combination of the medium to low sensitivity and the low magnitude of change experienced by residents would lead to a not significant effect.	months).
VP11 Hale Road east of Holme Hale Hall	Hale Road is the minor road connecting Bradenham to the east with Holme Hale to the west. The road runs along a low ridge from where views north across the River Wissey valley extend. Arable farmland occupies the land to the north and south of the road, the land to the south comprising also	The sensitivity of road-users to the proposed project would be medium to low . The value of the view would be medium. The view is not taken from a formal viewpoint and is not representative of any landscape designations. The susceptibility of road-	The magnitude of change for road-users would be medium to low . The separation distance of approximately 3.2km to the National Grid substation extension would limit the scale of the visible parts of the project, such that they would appear relatively small, especially seen within the wider panorama of the view. The National Grid substation extension would be	Not significant. The combination of the medium to low sensitivity and the medium to low magnitude of change experienced by road-users would	Medium term and reversible in respect of the temporary construction works (30 months).

Receptor	Baseline	Sensitivity	Magnitude of Change	Significance of Effect	Duration of Effect
	intermittent blocks of woodland, most notably Necton Common woodland seen across the middle ground of the view. Mature tree cover also encloses properties and farmsteads set along the road, the viewpoint being located to the east of Holme Hale Hall and west of Pond Farm.	users on Hale Road is medium to low. The relatively open aspect means that views would extend to the National Grid substation extension, albeit at an oblique angle to the direction of travel.	seen set within the woodland, such that its construction would be largely screened, although tall cranes and the emergence of the electrical infrastructure would still form a readily apparent feature. Parts of the onshore project substation, as it emerged during the construction phase, would also be visible between the trees and again, the tall cranes would draw further attention to this site. Whilst these features would appear at variance with the rural character experienced by road-users, the visual effect of the project would be moderated by the separation distance and the partial screening from woodland and existing developments.	lead to a not significant effect.	
VP 12 Ivy Todd	Ivy Todd is a hamlet approximately 1.7km east of the village of Necton. It comprises a cluster of residential properties and Ivy Todd Farm set within the valley of the unnamed river that flows from north to south to join the River Wissey. The hamlet is largely enclosed by tree cover and the majority of the houses are orientated in towards either Ivy Todd Road or Watery Lane. The only readily apparent opening occurs on the north side of the hamlet, where the garden	The sensitivity of residents to the proposed project would be medium . The value of the views of residents is medium. The hamlet is not covered by a conservation area designation and the surrounding landscape is not covered by any scenic designations, which would otherwise indicate a special value. The value relates to the importance of the visual amenity of local residents.	The magnitude of change for residents of Ivy Todd would be medium to low . From the viewpoint, located at the central crossroads in the village, there would be very limited visibility of the onshore project substation construction works, as these would be screened by the intervening tree cover to the east of the river. While there would be the possibility of seeing a very small part of the construction works through the tree cover this would have a limited magnitude of change. This is the only publicly accessible point from which a potential view would be gained (views further north on Lodge Lane are assessed	Not significant. The combination of the medium sensitivity and the medium to low magnitude of change experienced by residents would lead to a not significant effect.	Medium term and reversible in respect of the temporary construction works (30 months).

Receptor	Baseline	Sensitivity	Magnitude of Change	Significance of Effect	Duration of Effect
	grounds of Lodge Cottage appear open to the north. Lodge Lane extends alongside the unnamed river to the north of the hamlet and views from this path are represented by Viewpoints 2 and 3.	The susceptibility of residents' views is medium to low. The settlement is largely enclosed, such that it would be unlikely for residents to gain views of the proposed project from their internal living space, although views may occur from garden grounds, most notably at Lodge Cottage.	under viewpoints 2 and 3). While there is the potential that the onshore project substation construction works may be visible from the private garden grounds of Lodge Cottage, this would occur from a range of approximately 0.7km with intervening vegetation and landform reducing the vertical and horizontal extent of these works and this would moderate the magnitude of change.		

29.7.6 Potential Impacts during Operation

144. The potential impacts during the operational and maintenance phase would largely be limited to the presence of the above ground onshore infrastructure and its influence on landscape and visual receptors.
145. In the Norfolk Vanguard Scoping Opinion, the SoS agreed that the operational impacts of the landfall and onshore cable route could be scoped out of the assessment, but that consideration would be required of the impact of vegetation loss and the mitigation through replanting. These considerations have been made in the assessment of effects during the construction phase and presented in more detail in the OLEMS (document reference 8.7).
146. Prior to mitigation, the onshore project substation and National Grid substation extension have potential to give rise to significant visual effects during the operational phase owing to the presence of the components and their scale relative to the predominantly rural context. These would have an influence on landscape character and visual amenity, the effects of which are assessed in detail below.

29.7.6.1 Potential impacts during operation – Onshore project substation and National Grid substation extension.

147. The impact of the onshore project substation, National Grid substation extension and overhead line modification during the operational phase would relate to the presence of the sites and their component parts, and the influence these would have on landscape character and visual amenity. The onshore project substation would be located to the south-east of the National Grid substation extension as shown on Figure 29.4.
148. The impact of the onshore project substation, National Grid substation extension and overhead line modification during the operational phase would relate principally to the following features of the proposed projects.
- The effect on landscape character and visual amenity owing to the presence of the onshore project substation with converter halls up to 19m in height and occupying a site of 250m x 300m.
 - The effect on landscape character and visual amenity owing to the presence of the National Grid substation extension (145m x 200m) up to 15m in height.
 - The effect of the re-establishment of hedgerows over cable easements and woodland along the A47 road corridor.
 - The effect of mitigation planting in terms of its screening of the onshore project substation.

149. Mitigation measures associated with the onshore project substation would comprise planting as described in section 29.7.1 and shown on Figures 29.9a, 29.10b and 29.11b.
150. Table 29.12 shows the detail of the assessment for each receptor. In summary, the operational phase of the onshore project substation, National Grid substation extension and overhead line modification would have a significant effect on landscape character in the localised parts of the Settled Tributary Farmland LCT – River Wissey Tributary Farmland LCU and Plateau Farmland LCT – Beeston Plateau LCU and Pickenham Plateau LCU but would not have significant effects on the remaining parts and all other LCUs. In respect of the representative viewpoints, significant effects would arise from Lodge Lane to the immediate south of the site, a very localised section of Ivy Todd Road to the south-west and a section of the A47 to the north. These effects would all occur within 1.2km of the onshore project substation, making them localised. There would be no significant effects on the views of nearby residents at Ivy Todd and Necton.
151. Mitigation planting would be expected to reduce the visual effects from Viewpoint 4 – Necton Substation and Viewpoint 5 – A47 Spicer’s Corner within 10 years of the indicative design life, largely by screening the views of road-users on the A47. From Viewpoint 2 – Lodge Lane south and Viewpoint 3 – Lodge Lane north, mitigation planting would achieve a sufficient height relative to the height of the onshore project substations to mitigate the effects on the views of walkers on this local path by 20 years of the indicative design life. The effects on road-users and walkers, once mitigation planting had taken effect, would be **not significant**.

Table 29.12 Potential impacts during operation – Onshore project substation and National Grid substation extension

Receptor	Baseline	Sensitivity	Magnitude of Change	Significance of Effect	Duration of Effect
Onshore project substation – Landscape Receptors					
Plateau Farmland LCT – Pickenham Plateau LCU	The National Grid substation extension would be located in the Pickenham Plateau LCU. This LCU covers an extensive plateau area extending across the north-west of the study area. The National Grid substation extension would occur in the southern most ‘spur’ which lies to the immediate west of the narrow River Wissey Tributary Farmland. This spur forms a relatively level area of land which has been utilised for the development of Necton National Grid substation and Dudgeon substation. The overhead line extends along this spur to the north-west. The LCU is characterised by large fields of arable with limited enclosure. The A47 has a localised influence on the southern part of the spur, despite the enclosure of tree cover.	<p>The sensitivity of this LCU to the operational project is medium.</p> <p>The value of the LCU is medium – it is not covered by any landscape designations which might otherwise denote a special value. The landscape has been modified by agricultural practices and hedgerow loss has eroded the historic pattern of enclosure.</p> <p>The susceptibility of the LCU to the operational project is medium. Although the National Grid substation extension would be located in this LCU, it would occupy only a localised part of the much wider LCU. The susceptibility is moderated by the modified nature of the farmland and there is also an existing influence from the Necton National Grid substation, Dudgeon substation, and associated overhead lines.</p>	<p>The magnitude of change would be high within the local area, medium within the surrounding area and low or no effect across the wider LCU.</p> <p>While Necton National Grid substation and Dudgeon substation already have a notable influence on this LCU, the National Grid substation extension would increase the influence of large scale energy developments in this part of the LCU, thus detracting from the strength of the underlying rural character. The landscape character would be affected by the scale of the onshore project substation (145m x 200m) which would add notably to the existing footprint of the Necton National Grid substation and Dudgeon substation. The existing influence of large scale energy developments would be increased within this local landscape, although the extent contained by the enclosure of tree cover along the A47 to the north.</p>	<p>Not significant with the exception of a localised significant effect in the area of the spur. The combination of the medium sensitivity and the high magnitude of change would lead to a localised significant effect.</p> <p>Tree cover along the A47 would limit the northern influence of this landscape effect.</p> <p>Significant effect would be mitigated to not significant after 20 years of indicative design life.</p>	<p>Long term and reversible.</p> <p>Localised significant effect lasting for 20 years reducing to not significant for remaining 10 years of 30 year indicative design life.</p>

Receptor	Baseline	Sensitivity	Magnitude of Change	Significance of Effect	Duration of Effect
<p>Settled Tributary Farmland LCT – River Wissey Tributary Farmland LCU</p>	<p>The onshore project substation would be located in the River Wissey Tributary Farmland LCU and the National Grid substation would be located in the adjacent Pickenham Plateau LCU to the west. The landform of the local area is typical of the wider LCU with the valley sides sloping down towards the unnamed river course. The onshore project substation would be located on the upper slopes adjacent to the Beeston Plateau LCU to the east. The land use is predominantly arable farmland with a pattern of enclosure which has been eroded owing to the intensification of farming practices. Views are generally medium range, contained within the wider valley with some closer range enclosure where mature woodland and hedgerows occur. The Necton National Grid substation and Dudgeon substation are baseline</p>	<p>The sensitivity of this LCU to the operational project is medium.</p> <p>The value of the LCU is medium – it is not covered by any landscape designations which might otherwise denote a special value. The landscape has been modified by agricultural practices and hedgerow loss has eroded the historic pattern of enclosure.</p> <p>The susceptibility of the LCU to the operational project is medium. Although the onshore project substation would be located in this LCU, it would occupy only a localised part of the much wider LCU. The susceptibility is also moderated by the modification this landscape has undergone through the practices of intensive farming and there is an existing influence from the Necton National Grid substation, Dudgeon substation and associated overhead lines.</p>	<p>The magnitude of change would be high within the local area, medium within the surrounding area and low or no effect across the wider LCU.</p> <p>The local landscape character would be directly affected by the presence of the onshore project substation, with its maximum footprint of 250m x 300m and its maximum building height of 19m. This would form a large fenced site containing electrical infrastructure, the most notable components being the HVDC converter halls. Their scale and mass would appear at variance with the scale and character of the rural landscape. Despite the extent of mitigation planting around the onshore project substation, it would be insufficient in scale to completely reduce the landscape effect within the operational period.</p> <p>The local landscape character would be indirectly affected by the presence of the National Grid substation extension in the Pickenham Plateau to the north-west. Although separated from the River Wissey LCU, the extension of 145m x 200m containing electrical infrastructure up to 15m in height, in addition to the existing</p>	<p>Not significant with the exception of a localised significant effect in the area extending to the A47 to the north, Great Wood and Smuggler’s Lane to the east, Necton National Grid Substation and the Necton ridgeline to the west and Ivy Todd Road to the south. The combination of the medium sensitivity and the high magnitude of change would lead to a localised significant effect.</p>	<p>Long term and reversible.</p> <p>Localised significant effect lasting for 20 years reducing to not significant for remaining 10 years of 30 year indicative design life.</p>

Receptor	Baseline	Sensitivity	Magnitude of Change	Significance of Effect	Duration of Effect
	features on the spur of the Pickenham Plateau LCU to the north-west of the onshore project substation.		Necton National Grid substation and Dudgeon substation, would increase the influence of energy developments across the wider landscape.		
Plateau Farmland LCT – Beeston Plateau	The onshore project substation would be located immediately adjacent to a small southern spur of the Beeston Plateau LCU. The distinction between the LCUs in this transitional area is subtle, with the landform rounding off from the steeper valley into the flatter plateau. The land use is similarly arable farmland and enclosure is partly eroded causing larger field patterns. This local area is characterised by the mature Necton Wood in the adjoining River Wissey Tributary Farmland LCU and other blocks in the Beeston Plateau LCU to the north and south. The mobilisation area for the onshore project substation would be located in the spur of the LCU while the onshore project substation would be located	The sensitivity of this LCU to the operational project is medium . The value of the LCU is medium – it is not covered by any landscape designations which would otherwise denote a special value. The landscape has been modified by agricultural practices and although some hedgerow loss has occurred, the broad pattern of enclosure has remained intact. The susceptibility of the LCU to the operational project is medium. Although the onshore project substation temporary construction compound would be located in this LCU and may be retained to facilitate the Norfolk Boreas onshore project substation construction, it would occupy only a localised part of the much wider LCU. The susceptibility is also	The magnitude of change would be high within the local area, medium within the surrounding area and low or no effect across the wider LCU. The onshore project substation site in the River Wissey to the immediate west and the National Grid substation extension further west, would give rise to direct and indirect effects on local landscape character. Despite the baseline influence on landscape character from the Necton National Grid substation and Dudgeon substation, the large footprints and notable vertical scale of the onshore project substation and National Grid substation extension would increase the close range influence of energy developments on the character of this LCU.	Not significant with the exception of a localised significant effect in the area extending to the A47 to the north, Great Wood and Smuggler’s Lane to the east, and the LCU boundary to the west and south. The combination of the medium sensitivity and the high magnitude of change would lead to a localised significant effect.	Long term and reversible. Localised significant effect lasting for 20 years reducing to not significant for remaining 10 years of 30 year indicative design life.

Receptor	Baseline	Sensitivity	Magnitude of Change	Significance of Effect	Duration of Effect
	in the adjacent Tributary Farmland LCU to the west and the National Grid substation extension in the Pickenham Plateau LCU further west.	moderated by the modification this landscape has undergone through the practices of intensive farming and there is a baseline influence from the existing Necton National Grid substation, Dudgeon substation and associated overhead lines.			
Onshore project substation – Visual Receptors					
VP1 Ivy Todd Road west	This viewpoint is located on Ivy Todd Road, midway between the village of Necton and the hamlet of Ivy Todd at a point where a gated access track leads north through the adjacent farmland. The view is intended to be representative of the views of road-users, although the road is enclosed by mature hedgerows along much of its length, such that views are largely contained. This gated opening provides one of the few glimpsed views towards the site. Located on a localised high point, the landform falls away to the	<p>The sensitivity of road-users on this minor road would be medium.</p> <p>The value of the views of road-users is medium. The view is not from a formal viewpoint and does not look onto any designated landscapes.</p> <p>The susceptibility of road-users to the effects of the operational project is medium. While much of the road is enclosed by hedgerow, the alignment of this opening means that east-bound road-users would experience this view, albeit for a very short duration. In winter months, filtered views through the</p>	<p>The magnitude of change would be medium to high for the approximate 10m section where the opening to the field occurs and medium to low, low or no effect from the remaining sections.</p> <p>The photomontage in Figure 29.13c shows how the onshore project substation would form a prominent feature in the view. It would occupy a notable horizontal extent in this sector of the view and the vertical scale would extend above the surrounding and background tree cover. It would appear at variance with the rural character of the baseline view, owing to its large mass and scale, and despite the existing presence and influence of the</p>	<p>The effect would be significant along the approximate 10m section of road from which this open view would be experienced, or more extensively if roadside hedgerows are cut low by landowners or another party. The combination of the medium sensitivity and the medium to high magnitude of change would lead to a localised significant effect.</p> <p>Not significant along remaining sections.</p>	<p>Long term and reversible.</p> <p>Localised significant effect lasting for 25 years reducing to not significant for remaining 5 years of 30 year indicative design life.</p>

Receptor	Baseline	Sensitivity	Magnitude of Change	Significance of Effect	Duration of Effect
	north-east where the onshore project substation site would be located. The Necton National Grid substation and Dudgeon substation are not readily visible from this viewpoint, although the overhead line is.	hedgerow may be experienced although this limited visibility would limit the susceptibility of road-users to the onshore project substation. If hedgerows were cut low along elevated sections, this might give rise to additional visibility.	transmission towers. The extent of the medium to high magnitude of change would be contained within the very short section of road from which this open view would be experienced. From the remainder of the road between Necton and Ivy Todd the magnitude of change would be low, negligible or no effect, despite the fact filtered views may be experienced during the winter months.		
VP2 Lodge Lane south	This viewpoint is located on Lodge Lane to the north of the hamlet of Ivy Todd. It looks north-east across the arable farmland towards the onshore project substation site at a range of approximately 610m. The view is representative of the views of walkers in this area and is characterised by the presence of Necton National Grid substation and Dudgeon substation which, along with the associated overhead line, forms a readily apparent feature along the skyline. The view is contained in the middle range by the subtle	The sensitivity of walkers on Lodge Lane would be medium . The value of views of walkers is medium. The view is not from a formal viewpoint and is not representative of any landscape designations. The existing Necton National Grid substation, Dudgeon substation and overhead line are evident, and these make large scale electricity developments a feature of the baseline views from Lodge Lane. The susceptibility of walkers to the effects of the operational project is medium. Access on the lane provides only a short	The magnitude of change would be medium to high over the approximate 550m southern section of Lodge Lane. Figure 29.14c shows how the onshore project substation would form a prominent feature, seen approximately 610m from the viewpoint and set along the containing skyline of the view. Intervening hedgerows and tree cover would provide some screening, especially of the lower parts of the onshore project substation and the curvature of the landform would ensure only the southern parts of the onshore project substation would be visible. Despite this, the horizontal spread would extend beyond the mature trees to the right of centre	Significant along the approximate 550m southern section of Lodge Lane. The combination of the medium sensitivity and the medium to high magnitude of change would lead to a localised significant effect. Not significant after the first 20 years of the project's life as planting matured to largely screen the onshore project substation. Effect beneficial after 20 years as mitigation planting would enhance visual amenity of area.	Long term and reversible. Localised significant effect lasting for 20 years reducing to not significant for remaining 10 years of 30 year indicative design life.

Receptor	Baseline	Sensitivity	Magnitude of Change	Significance of Effect	Duration of Effect
	relief of the landform and enclosure of hedgerows. Hedgerows and tree cover are depleted within the farmland but more substantial around Ivy Todd to the south.	walk as it does not connect with the wider PRoW network. The experience of walkers is already influenced by the existing electricity developments although this viewpoint would be close to the onshore project substation.	and the scale of the converter halls would be comparable with the height of the mature trees to the fore. The magnitude of change would be high for much of the length of Lodge Lane owing to the relatively open views. This would be gradually reduced to medium to low as mitigation planting matured over the first 20 years of the indicative design life. The National Grid substation extension would not increase the magnitude of change, owing to its location behind the existing National Grid and Dudgeon Substations. These existing developments would largely screen the new extension and therefore, reduce its influence on the views of walkers on Lodge Lane.		
VP3 Lodge Lane north	This viewpoint is located at the northern end of Lodge Lane to the north of the hamlet of Ivy Todd. It is not a PRoW but is shown on OS mapping as a route with public access. The view looks north towards the mature tree cover that encloses Lodge Farm and north-west towards the Necton National Grid substation and Dudgeon	The sensitivity of walkers on Lodge Lane to the operational project is medium . The value of the views of walkers is medium to low. The view is not from a formal viewpoint and does not look onto any landscape designations. The existing Necton National Grid substation, Dudgeon substation and overhead line	The magnitude of change as a result of the operational project would be medium over the approximate 250m northern section of the lane. Despite the closer range of this viewpoint, at approximately 330m, compared to 610m for Viewpoint 2, there would be less visibility of the operational onshore project substation owing to the closer proximity of the intervening vegetation. The trees which enclose	Significant in the northern section of Lodge Lane for approximately 250m. The combination of the medium sensitivity and the medium magnitude of change would lead to a significant effect. Not significant after the first 20 years of the project's indicative design life as planting matured to largely screen the onshore project	Long term and reversible. Localised significant effects lasting for 20 years reducing to not significant for

Receptor	Baseline	Sensitivity	Magnitude of Change	Significance of Effect	Duration of Effect
	<p>substation.</p> <p>The view looks across the arable farmland towards the onshore project substation at a range of approximately 330m. The view is representative of the views of walkers in this area and features the Necton National Grid substation and Dudgeon substation which, along with the associated overhead line, form readily apparent development along the skyline. To the north the view is contained in the middle range by the subtle relief of the landform and enclosure of hedgerows. Hedgerows and tree cover are depleted within the farmland but more substantial around Ivy Todd to the south.</p>	<p>are evident, and these make large scale electricity developments a feature of the baseline views from Lodge Lane.</p> <p>The susceptibility of walkers to the effects of the operational project is medium. Access on the lane provides only a short walk as it does not connect with the wider PRow network. As the lane approaches Lodge Farm, visibility of the onshore project substation and the National Grid substation extension would become increasingly screened by intervening vegetation. The experience of walkers closer to the viewpoint is already influenced by the existing electricity developments although this viewpoint would be close to the onshore project substation.</p>	<p>Lodge Farm would screen part of the onshore project substation, with only some of the taller components visible at the left side where the hedgerow and hedgetrees provide lower and more broken cover. These components would however, form large scale features that would alter the character of walkers' views from Lodge Lane. Mitigation planting would grow to screen much of the onshore project substation after 20 years of the indicative design life and this would reduce the magnitude of change to low.</p> <p>The National Grid substation extension would not increase the magnitude of change, owing to its location behind the existing National Grid and Dudgeon Substations. These existing developments would largely screen the new extension and therefore, reduce its influence on the views of walkers on Lodge Lane.</p>	<p>substation.</p> <p>Effect beneficial after 20 years as mitigation planting would enhance visual amenity of area.</p>	<p>remaining 10 years of 30 year indicative design life.</p>
VP4 A47 Necton Substation	<p>This viewpoint is located at the access from the A47 into Necton National Grid substation. It represents the views of road-users on the A47 which are filtered by</p>	<p>The sensitivity of road-users on this section of the A47 is medium.</p> <p>The value of the views from the A47 is medium. The A47 is not a 'scenic route' and this</p>	<p>The magnitude of change experienced by road-users on the adjacent sections of the A47 would be medium.</p> <p>There would be a limited effect in respect of the onshore project</p>	<p>Not significant. The combination of the medium sensitivity and the medium magnitude of change would lead to a not significant effect. Despite the close</p>	<p>Short term and reversible.</p> <p>Localised significant effects</p>

Receptor	Baseline	Sensitivity	Magnitude of Change	Significance of Effect	Duration of Effect
	<p>bare trees in the winter and screened by leafed trees in the summer. While there are some more open sections, substantial mitigation planting associated with the Dudgeon onshore works will add further to the screening effect over time. The access provides a view that at most would be glimpsed by passing road-users travelling at speed. The Necton National Grid substation forms the characterising feature in this view. It appears at variance with the rural character of the surrounding landscape and establishes energy developments as a feature of the baseline view.</p>	<p>section does not pass through any landscape designations. There are no formal viewpoints and nearby laybys are largely enclosed by tree cover.</p> <p>The susceptibility of road-users to the effects of the operational project is medium. While the onshore project substation would be largely screened by intervening landform and the Necton National Grid substation, the National Grid substation extension would be close in range. From adjacent parts of the A47, tree cover encloses most of the views, although views may occur at this access and through other gaps and this raises the susceptibility.</p>	<p>substation as it would be located below the level of the intervening landform and screened by the intervening substations. The National Grid substation extension would be more readily visible, with the extension seen to the fore of the Necton National Grid Substation. The baseline character of this site as an established energy development, combined with the presence of the large scale overhead line towers, would moderate the overall effect. Furthermore, screening along the adjacent parts of the A47 from existing vegetation, coupled with the additional screening from mitigation planting associated with Dudgeon Substation, would mitigate the effect on road-users within the first 10 years.</p>	<p>proximity of the National Grid substation extension, the existing influence of energy developments in this view combined with the extent of screening along the A47 would moderate the potential effect.</p>	<p>lasting for 10 years reducing to not significant for remaining 20 years of 30 year indicative design life of the project.</p>
<p>VP5 A47 Spicer's Corner</p>	<p>This viewpoint is located opposite Spicer's Corner layby on the A47. It represents the views of road-users on the A47 which are filtered by bare trees in the winter and screened by leafed trees in the summer. While there are some open</p>	<p>The sensitivity of road-users on this section of the A47 is medium.</p> <p>The value of the views of road-users on the A47 is medium. The A47 is not a 'scenic route' and this section does not pass through any landscape designations. There are no</p>	<p>The magnitude of change experienced by road-users on the adjacent sections of the A47 would be medium to high reducing to low.</p> <p>The photomontage in Figure 29.17c shows how the onshore project substation would be visible at 1.1km from the viewpoint, seen as a prominent feature set along the</p>	<p>Significant over a 300m section for the first 10 years. The combination of the medium sensitivity and the medium to high magnitude of change would lead to a localised significant effect.</p> <p>Not significant after the first 10 years of operation owing</p>	<p>Long term and reversible.</p> <p>Localised significant effects lasting for 10 years reducing to</p>

Receptor	Baseline	Sensitivity	Magnitude of Change	Significance of Effect	Duration of Effect
	sections where glimpsed views over the adjacent landscape can be experienced, mitigation planting associated with the Dudgeon onshore works will add further to the screening effect over time. The gated opening provides a view that at most would be glimpsed by passing road-users travelling at speed. The view is of arable farmland with hedgerow and woodland enclosure and expansive in extent. The existing Necton National Grid substation, Dudgeon substation and the overhead line are readily apparent in this view, although would not be readily apparent to road-users on the A47.	formal viewpoints and nearby laybys are largely enclosed by tree cover. The susceptibility of road-users to the effects of the operational project is medium. The combination of mitigation planting associated with Dudgeon Substation, established along the southern side of the A47, and mitigation planting around the new access road, would reduce visibility in the directions of the operational onshore project substation and National Grid substation extension.	skyline and comprising a group of converter halls and other electrical infrastructure. The onshore project substation would appear at variance with the small scale and rural character of the surrounding rural landscape and this would give rise to a medium to high magnitude of change during the first 10 years of operation. Beyond this, the establishment of the Dudgeon mitigation planting along the southern side of the A47 would grow to largely screen the views of road-users. An opening of approximately 16m would remain around the access junction through which glimpsed views of the onshore project substation would be experienced. The establishment of mitigation planting to the south of the A47 and the access road, would over 10 years, come to screen views south towards the onshore project substation and south-west towards the National Grid substation extension.	to the screening effects of mitigation planting. Effect beneficial after 10 years as mitigation planting would enhance visual amenity of area.	not significant for remaining 20 years of 30 year indicative design life.
VP6 A47 Top Farm	This viewpoint is located west of the layby on the A47 to the west of the access road to Top Farm. It	The sensitivity of road-users on the A47 to the operational project is medium.	The magnitude of change experienced by road-users on the adjacent sections of the A47 would be medium	Not significant. The combination of the medium sensitivity and medium to low magnitude of change	Long term and reversible.

Receptor	Baseline	Sensitivity	Magnitude of Change	Significance of Effect	Duration of Effect
	<p>represents the views of road-users on the A47 which are filtered by bare trees in the winter and screened by leafed trees in the summer. While there are some open sections, mitigation planting associated with the Dudgeon substation will add further to the screening effect over time. This gated opening provides a view that at most would be glimpsed by passing road-users travelling at speed. The view is of arable farmland with hedgerow and woodland enclosure and expansive in extent. The existing Necton National Grid substation, Dudgeon substation and the overhead line are readily apparent in this view, although would not be readily apparent to road-users on the A47.</p>	<p>The value of the views from the A47 is medium. The A47 is not a 'scenic route' and this section does not pass through any landscape designations. There are no formal viewpoints and nearby laybys are largely enclosed by tree cover.</p> <p>The susceptibility of road-users to the effects of the onshore project substation is medium. While roadside vegetation aligns the road between the layby and Viewpoint 5, it is thin and fragmented in parts and views through to the adjacent landscape occur, albeit fleeting and experienced whilst in transit at high speeds.</p>	<p>to low.</p> <p>While the photomontage in Figure 29.18c shows how the onshore project substation and National Grid substation extension would be readily apparent, road-users would not experience such clear views. A glimpsed view would occur as road-users would pass the gated opening, but this would be short in duration and at an oblique angle to the direction of travel. Views from adjacent sections would be largely screened by intervening tree cover although filtered and glimpsed views would potentially alter the experience of road-users, by introducing large-scale energy developments into their views. Views of Necton National Grid substation and the National Grid substation extension would be apparent further to the west and the effects of this are assessed under Viewpoint 5.</p>	<p>would lead to a not significant effect.</p> <p>Effect beneficial after 10 years as mitigation planting would enhance visual amenity of area</p>	
VP7 Ivy Todd Road east	<p>This viewpoint is located on Ivy Todd Road, midway between the hamlet of Ivy Todd and the cluster of properties around Willow</p>	<p>The sensitivity of road-users on this minor road to the operational project is medium.</p> <p>The value of the view is medium. The view is not from</p>	<p>The magnitude of change experienced by road-users would be medium to low.</p> <p>Figure 29.19c shows how the hedgerows and hedgetrees on the</p>	<p>Not significant. The combination of the medium sensitivity and medium to low magnitude of change would lead to a not</p>	<p>Long term and reversible.</p>

Receptor	Baseline	Sensitivity	Magnitude of Change	Significance of Effect	Duration of Effect
	Farm, along a section which is largely unenclosed to the north. The view is representative of the views of road-users, along this open section of approximately 200m. The road to the west is enclosed by hedge banks and to the east by hedgerow and tree cover. Located on a localised high point next to Vale House access, the landform falls away to the north-west where the onshore project substation site would be located. Necton National Grid substation and Dudgeon substation are not readily apparent from this viewpoint, although the overhead line is.	a formal viewpoint and does not look onto any landscape designations. The susceptibility of road-users to the operational project is medium. While much of the road is enclosed by hedgerow, this section opens up the view, although still contained within the close range by the field boundary to the north, behind which the onshore project substation would be located.	field boundary would largely screen the onshore project substation. Only a limited horizontal extent would be visible owing to the screening effect of the denser vegetation and the vertical extent would be reduced by the setting of the converter halls partly below the ridgeline. Visibility would be partly filtered by intervening trees. Despite the limited visibility, it would be evident as development and this would alter the character of the rural view. Mitigation planting would, over time, bolster the screening effect of the existing vegetation as it matured.	significant effect. The extent to which the onshore project substation would be screened by intervening tree cover would notably reduce its visual influence.	
VP8 Chapel Road, Necton	This viewpoint is located on the south-east edge of Necton and is representative of the views of residents along this edge. The properties along Chapel Road are orientated west, such that their rear elevations and gardens are orientated east	The sensitivity of residents to the operational project is medium . The value of the view is medium. The view is not taken from a formal viewpoint and is not representative of any landscape designations. The value relates to the visual	The magnitude of change on local residents would be medium to low. The majority of the operational onshore project substation would be screened by intervening landform. The visualisation in Figure 29.20c shows how only the tips of the lightning protection masts would potentially be visible above the	Not significant. The combination of the medium sensitivity and medium to low magnitude of change would lead to a not significant effect.	Long term and reversible.

Receptor	Baseline	Sensitivity	Magnitude of Change	Significance of Effect	Duration of Effect
	towards the onshore project substation site. The adjacent farmland is characterised by large arable fields with intermittent hedgerow enclosure. The view is contained within the close range by the convex landform with transmission towers and trees forming apparent vertical features along the skyline. Necton National Grid substation and Dudgeon substation are not readily apparent from this viewpoint, although the overhead line is.	amenity of residents on this eastern side of the settlement. The susceptibility of residents to the operational project is medium. The backs of the properties are orientated towards the site and although intervening landform, boundary fences and garden vegetation would largely screen the onshore project substation, there is potential that the taller components may be visible from the ground level of the more elevated properties and form the upper floors of all properties, and this raises susceptibility.	skyline. These would form small scale and relatively discreet features and in the context of the baseline transmission towers would not appear out of character. From the more elevated properties to the north of the viewpoint and from the upper floors of all the properties, there would be the possibility that a greater extent of the taller elements would be visible above the intervening landform and hedgerows. While these would form an apparent feature, the separation distance of approximately 1.4km and the limited extent to which they would be visible, would moderate the effect.		
VP9 St Andrews Lane, Necton	St Andrews Lane forms an arc around the north-east edge of Necton, connecting Tuns Road, close to the A47, with the Chapel Road junction, where Viewpoint 8 is located. Whilst there is residential development at both these ends, and a cluster of developments to the south of the road in the	The sensitivity of residents to the proposed project would be medium to high . The value of the view would be medium to high. The view is not taken from a formal viewpoint and is not representative of any landscape designations. The value relates to the visual	The magnitude of change would be medium to low . The majority of the National Grid substation extension would be screened by intervening landform, such that it would only be partly visible from the north-eastern edge of Necton. The visualisation in Figure 29.21c shows how only the top of the National Grid substation extension	Not significant. The combination of the medium to high sensitivity and the medium to low magnitude of change would lead to a not significant effect.	Long term and reversible.

Receptor	Baseline	Sensitivity	Magnitude of Change	Significance of Effect	Duration of Effect
	<p>middle, the majority of the road is undeveloped. At the southern end the properties are mostly two-storey and semi-detached with some bungalows at the top end of the street. The middle section is enclosed by mature and continuous hedgerow on either side, with openings to the east only for farm access, and to the west where access to the Rectory and Necton Grange Care Home occurs. These properties are largely enclosed by garden vegetation. Further north, the eastern side of the road opens up and the views of road-users extend across the adjacent arable farmland. While the Dudgeon and Necton Substations are not readily apparent from the road, transmission towers can be seen along the skyline.</p> <p>The road is low at either end and rises in the middle. The viewpoint is located at the</p>	<p>amenity of residents on this eastern side of the settlement.</p> <p>The susceptibility of residents to the construction of the National Grid substation extension is medium. The backs of the properties are orientated towards the site and although intervening landform, boundary fences and garden vegetation would largely screen the construction works, higher elements would be visible, most notably tall cranes, especially from upper floors, and this raises susceptibility.</p>	<p>would be visible above the skyline, and this would be visible from the more elevated properties and upper floors of adjacent properties. The limited extent of visibility would moderate the effect and ensure that it would not give rise to a notable effect.</p> <p>Furthermore, mitigation planting along the southern boundary of the National Grid substation extension would grow to form a screen to the development, which would effectively mitigate effects after 20 years of the indicative design life.</p>		

Receptor	Baseline	Sensitivity	Magnitude of Change	Significance of Effect	Duration of Effect
	high point where the first farm field opening occurs, from where the overhead line is visible along with the top of Dudgeon Substation.				
VP10 Holme Hale	Holme Hale is a small village located approximately 2km to the south-east of Necton. It is essentially a linear settlement, set across rising landform from north to south, with properties mostly inward looking and enclosure afforded by surrounding tree cover. The representative viewpoint is located on Station Road to the south-east of the Hamlet, where the landform is more elevated. The view extends from this ridge over the valley of the River Wissey to the spur of subtly elevated land where the overhead line forms a readily visible feature along the skyline. The Dudgeon and Necton substations form a small scale and distant feature partly concealed by intervening tree cover. The	<p>The sensitivity of residents and road-users to the proposed project would be medium to low.</p> <p>The value of the view would be medium. The view is not taken from a formal viewpoint and is not representative of any landscape designations.</p> <p>The susceptibility of residents to the operation of the proposed project is low. Views from the village are largely contained by the enclosure of built form and tree cover. The susceptibility of road-users on Station Road is medium to low. The elevated location and relatively open aspect means that views potentially extend to both the National Grid substation extension and onshore project substation, albeit at an oblique angle to the directions of travel.</p>	<p>The magnitude of change for residents would be low and for road-users would be medium to low.</p> <p>The separation distance of approximately 3.4km to the National Grid substation extension and approximately 3.3km to the onshore project substation would limit the scale of the new developments, such that they would appear relatively small, especially seen within the wider panorama of the view. The National Grid substation extension would be set behind the Dudgeon and Necton Substations, such that it would be largely screened and not make a notable difference. While parts of the onshore project substation, would be visible between the trees, comparisons in scale with closer range trees would reduce the perceived scale of the converter halls and this would reduce their perceived prominence in the view. Whilst these distant features would appear at variance with the rural character</p>	<p>Not significant.</p> <p>The combination of the medium to low sensitivity and the medium to low magnitude of change experienced by road-users would lead to a not significant effect. The combination of the medium to low sensitivity and the low magnitude of change experienced by residents would lead to a not significant effect.</p>	Long term and reversible.

Receptor	Baseline	Sensitivity	Magnitude of Change	Significance of Effect	Duration of Effect
	view is otherwise typically rural with a predominance of arable farmland and small interspersed settlements.		experienced by road-users, the visual effect of the proposed project would not redefine the character of these views.		
VP11 Hale Road east of Holme Hale Hall	Hale Road is the minor road connecting Bradenham to the east with Holme Hale to the west. The road runs along a low ridge from where views north across the River Wissey valley extend. Arable farmland occupies the land to the north and south of the road, the land to the south comprising also intermittent blocks of woodland, most notably Necton Common woodland seen across the middle ground of the view. Mature tree cover also encloses properties and farmsteads set along the road, the viewpoint being located to the east of Holme Hale Hall and west of Pond Farm.	<p>The sensitivity of road-users to the proposed project would be medium to low.</p> <p>The value of the view would be medium. The view is not taken from a formal viewpoint and is not representative of any landscape designations.</p> <p>The susceptibility of road-users on Hale Road is medium to low. The relatively open aspect means that views would extend to the National Grid substation extension, albeit at an oblique angle to the direction of travel.</p>	<p>The magnitude of change for road-users would be medium to low.</p> <p>The separation distance of approximately 3.2km to the National Grid substation extension would limit the scale of the sites, such that they would appear relatively small, especially seen within the wider panorama of the view. The National Grid substation extension would be seen set behind an area of woodland which would partly screen the wider extent of energy developments in this area. While parts of the onshore project substation, would be visible between the trees, comparisons in scale with closer range trees would reduce the perceived scale of the converter halls and this would reduce their perceived prominence in the view. Whilst these distant features would appear at variance with the rural character experienced by road-users, the visual effect of the proposed project would not redefine</p>	<p>Not significant.</p> <p>The combination of the medium to low sensitivity and the medium to low magnitude of change experienced by road-users would lead to a not significant effect.</p>	Long term and reversible.

Receptor	Baseline	Sensitivity	Magnitude of Change	Significance of Effect	Duration of Effect
			the character of these views.		
VP12 Ivy Todd	Ivy Todd is a hamlet approximately 1.7km east of the village of Necton. It comprises a cluster of residential properties and Ivy Todd Farm set within the valley of the unnamed river that flows from north to south to join the River Wissey. The hamlet is largely enclosed by tree cover and the majority of the houses are orientated in towards either Ivy Todd Road or Watery Lane. The only readily apparent opening occurs on the north side of the hamlet, where the garden grounds of Lodge Cottage appear open to the north. Lodge Lane extends alongside the unnamed river to the north of the hamlet and views from this path are represented by Viewpoints 2 and 3.	<p>The sensitivity of residents to the proposed project would be medium.</p> <p>The value of the views of residents is medium. The hamlet is not covered by a conservation area designation and the surrounding landscape is not covered by any scenic designations, which would otherwise indicate a special value. The value relates to the importance of the visual amenity of local residents.</p> <p>The susceptibility of residents' views is medium to low. The settlement is largely enclosed, such that it would be unlikely for residents to gain views of the proposed project from their internal living space, although views may occur from garden grounds, most notably at Lodge Cottage.</p>	<p>The magnitude of change for residents of Ivy Todd would be medium to low.</p> <p>The photomontage in Figure 29.24b shows that from the viewpoint, located at the central crossroads in the village, there would be very limited visibility of Norfolk Vanguard with the possibility of seeing a very small part of the onshore project substation through the tree cover. This is the only publicly accessible point from which a potential view would be gained (views further north on Lodge Lane are assessed under viewpoints 2 and 3). While there is the potential that the onshore project substation may be visible from the private garden grounds of Lodge Cottage, this would occur from a range of approximately 0.7km with intervening vegetation and landform reducing the vertical and horizontal extent of the onshore project substation visible. Mitigation planting along the southern side of the onshore project substation would gradually mitigate these effects.</p>	Not significant. The combination of the medium sensitivity and the medium to low magnitude of change experienced by residents would lead to a not significant effect.	Long term and reversible.

29.7.7 Potential Impacts during Decommissioning

152. This section describes the potential impacts of the decommissioning of the onshore project area with regard to impacts on landscape and visual receptors. Further details are provided in Chapter 5 Project Description.
153. No decision has been made regarding the final decommissioning policy for the onshore cables, as it is recognised that industry best practice, rules and legislation change over time. It is likely the onshore cables would be pulled through the ducts and removed, with the ducts themselves left in situ in order to minimise further ground disturbance.
154. In relation to the onshore project substation and National Grid substation extension, the programme for decommissioning is expected to be similar in duration to the construction phase. The detailed activities and methodology would be determined later within the project lifetime, but are expected to include:
- Dismantling and removal from site of outside electrical equipment located outside of the onshore project substation buildings and at the National Grid substation extension;
 - Removal of cabling from sites;
 - Dismantling and removal of electrical equipment from within the onshore project substation buildings;
 - Removal of main onshore project substation building and minor services equipment;
 - Demolition of the support buildings and removal of fencing at onshore project substation and National Grid substation extension;
 - Landscaping and reinstatement of the sites (including land drainage); and
 - Removal of areas of hard standing.
155. Whilst details regarding the decommissioning of the onshore project substation are currently unknown, considering the worst case scenario (which would be the removal and reinstatement of the current land use at the site) it is anticipated that the impacts would be similar to or less than those assessed during construction. The difference at the decommissioning phase would be that mitigation planting would have matured over 30 years of the indicative design life and therefore have greater potential to screen the decommissioning works.
156. The decommissioning methodology would need to be finalised nearer to the end of the lifetime of the project so as to reflect current guidance, policy and legislation at that point. Any such methodology would be agreed with the relevant authorities and statutory consultees. The decommissioning works could be subject to a separate licensing and consenting approach.

29.8 Cumulative Impacts

157. The cumulative assessment of landscape and visual impacts considers the potential for cumulative impacts to arise as a result of the project in conjunction with other developments. Table 29.13 lists other wind farm projects, major infrastructure projects and other developments which are potentially relevant to the project along with an initial judgement as to whether the potential cumulative impacts require to be assessed in detail in this CIA. The projects identified for potential cumulative impacts with Norfolk Vanguard have been agreed with Norfolk County Council.
158. The development most relevant to the CIA for the Norfolk Vanguard onshore project substation and National Grid substation extension is the Norfolk Boreas onshore project substation and National Grid substation extension. The cumulative scenario considered in the assessment comprises these developments in the context of the existing Necton National Grid substation and Dudgeon substation.
159. The developments most relevant to the onshore project substation are within relatively close range to one another and the CIA considers the effects of the clustering of these developments in this area.

Table 29.13 Summary of projects considered for the CIA in relation to landscape and visual receptors

Project	Status	Development period	Distance from Norfolk Vanguard (km)	Project definition	Project data status	Included in CIA	Rationale
National Infrastructure Planning							
Norfolk Boreas Offshore Wind Farm	Pre-Application	Expected construction date 2026	0 – projects are co-located	https://corporate.vattenfall.co.uk/norfolkboreas	High	Yes	Norfolk Boreas onshore project substation and National Grid substation extension would be sited adjacent to the respective onshore infrastructure of the Norfolk Vanguard project. There is the potential significant cumulative effects may arise in conjunction with this project and therefore it is included in the CIA.
Hornsea Project Three Offshore Wind Farm	Pre-Application	Expected construction date 2021	0 – cable intersects project 32km between substation locations	Full PEIR available: http://www.dongenergy.co.uk/en/Pages/PEIR-Documents.aspx	High	Yes	Hornsea Project Three Offshore Wind Farm onshore cable route would cross the Norfolk Vanguard onshore cable route to the north-east of Reepham and construction compounds would be located near disused Oulton Airfield. Other onshore infrastructure would be sited in distant locations from Norfolk Vanguard onshore infrastructure. There is the potential significant cumulative effects may arise in conjunction with this project and therefore it is included in the CIA.
Dudgeon Offshore Wind Farm	Commissioned	Constructed	0	http://dudgeonoffshorewind.co.uk/	Complete/high	No (considered in main assessment)	National Grid substation extension sited adjacent to constructed and operational Dudgeon Substation. This development is operational and is therefore included in the main assessment and not included in the CIA.
A47 corridor improvement	Pre-application	Expected construction date	2.5	https://infrastructure.planninginspector	Medium	No	A47 improvement works would have a limited influence on the cumulative

Project	Status	Development period	Distance from Norfolk Vanguard (km)	Project definition	Project data status	Included in CIA	Rationale
programme – North Tuddenham to Easton		2021-23		ate.gov.uk/projects/eastern/a47-north-tuddenham-to-easton/			situation owing to separation distance and limited inter-visibility with Norfolk Vanguard onshore infrastructure. The potential for significant cumulative effects to arise in conjunction with this project are limited and therefore it is not included in the CIA.
A47 corridor improvement programme – A47 Blofield to North Burlingham	Pre-application	Expected construction date 2021-22	25	https://infrastructure.planninginspectorate.gov.uk/projects/eastern/a47-blofield-to-north-burlingham/	Medium	No	
A47 corridor improvement programme – A47 / A11 Thickthorn	Pre-application	Expected construction date 2020-21	18	https://infrastructure.planninginspectorate.gov.uk/projects/eastern/a47a11-thickthorn-junction/	Medium	No	
Norwich Western Link	Pre-application	2022	2.8	https://www.norfolk.gov.uk/roads-and-transport/major-projects-and-improvement-plans/norwich/norwich-western-link/timeline	Medium	No	The Norwich Western Link works would have a limited influence on the cumulative situation owing to separation distance and limited inter-visibility with Norfolk Vanguard onshore infrastructure. The potential for significant cumulative effects to arise in conjunction with this project are limited and therefore it is not included in the CIA.
Third River Crossing (Great Yarmouth)	Pre-application	Expected to start in 2020	28	https://www.norfolk.gov.uk/roads-and-transport/major-projects-and-improvement-plans/great-	Medium	No	The Third Crossing works at Great Yarmouth would have a limited influence on the cumulative situation owing to separation distance and limited inter-visibility with Norfolk Vanguard onshore infrastructure. The potential for significant

Project	Status	Development period	Distance from Norfolk Vanguard (km)	Project definition	Project data status	Included in CIA	Rationale
				yarmouth/third-river-crossing			cumulative effects to arise in conjunction with this project are limited and therefore it is not included in the CIA.
King's Lynn B Power Station amendments	Pre-application	Construction expected 2018-2021	28	https://www.kingslynnbccgt.co.uk/	Medium	No	The Kings Lynn B Power Station amendment works would have a limited influence on the cumulative situation owing to separation distance and limited inter-visibility with Norfolk Vanguard onshore infrastructure. The potential for significant cumulative effects to arise in conjunction with this project are limited and therefore it is not included in the CIA.
North Norfolk							
PF/17/1951 Erection of 43 dwellings and new access with associated landscaping, highways and external works	Awaiting decision	Anticipated Q2 2018	0.7	Application available: https://idoxpa.north-norfolk.gov.uk/online-applications/applicationDetails.do?activeTab=summary&keyVal=_NNORF_DCA_PR_92323	High	No	Development at Laundry Loke in North Walsham would have a limited influence on the cumulative situation owing to separation distance and limited inter-visibility with Norfolk Vanguard onshore infrastructure. The site is situated in the centre of the town and surrounded by urban development. The potential for significant cumulative effects to arise in conjunction with this project are limited and therefore it is not included in the CIA.
Bacton Gas Terminal Extension	Approved	Approved 20/09/2016. Expires 20/09/2019	3.0	Approved PDS available https://idoxpa.north-norfolk.gov.uk/online-	Medium	No	Bacton Gas Terminal Extension would have a limited influence on the cumulative situation owing to separation distance and limited inter-visibility with Norfolk Vanguard onshore infrastructure. The potential for significant cumulative effects

Project	Status	Development period	Distance from Norfolk Vanguard (km)	Project definition	Project data status	Included in CIA	Rationale
				applications/applicationDetails.do?activeTab=summary&keyVal=_NNORF_DCA PR_88689			to arise in conjunction with this project are limited and therefore it is not included in the CIA.
Bacton Gas Terminal Coastal Protection	Approved	Approved 18/11/2016. Expires 18/11/2019	2.5	Approved PDS available	Medium	No	Bacton Gas Terminal coastal protection would have a limited influence on the cumulative situation owing to separation distance and limited inter-visibility with Norfolk Vanguard onshore infrastructure. The potential for significant cumulative effects to arise in conjunction with this project are limited and therefore it is not included in the CIA.
Bacton and Walcott Coastal Management Scheme	Approved	Expected construction date 2018	1.0	Public information leaflets available: https://www.north-norfolk.gov.uk/media/3371/bacton-to-walcott-public-information-booklet-july-2017.pdf	Medium	No	Bacton Coastal Protection Scheme would have a limited influence on the cumulative situation owing to separation distance and limited inter-visibility with Norfolk Vanguard onshore infrastructure. The potential for significant cumulative effects to arise in conjunction with this project are limited and therefore it is not included in the CIA.
Breckland							
21-31 new dwellings in Necton (BLR/2017/001/PIP)	Awaiting decision	Not known. Application submitted November 2017.	1.0	http://planning.breckland.gov.uk/OcellaWeb/showDocuments?reference=BLR/2017/0001/PIP&module=pl	Medium	No	Development of the Diner site at Necton would have a limited influence on the cumulative situation owing to separation distance and limited inter-visibility with Norfolk Vanguard onshore infrastructure. The site is situated on the north-west of the

Project	Status	Development period	Distance from Norfolk Vanguard (km)	Project definition	Project data status	Included in CIA	Rationale
							village and is set within an existing urban context. The potential for significant cumulative effects to arise in conjunction with this project are limited and therefore it is not included in the CIA.
4-8 new dwellings in Necton (BLR/2017/0002/PIP)	Awaiting decision	Not known. Application submitted November 2017.	1.0	http://planning.breckland.gov.uk/OcellaWeb/showDocuments?reference=BLR/2017/0002/PIP&module=pl	Medium	No	Development of the former school site at Necton would have a limited influence on the cumulative situation owing to separation distance and limited inter-visibility with Norfolk Vanguard onshore infrastructure. The site is enclosed within the existing village core. The potential for significant cumulative effects to arise in conjunction with this project are limited and therefore it is not included in the CIA.
Swan's Nest, Brandon Road, Swaffham – 3PL/2012/0576/0 and other associated applications	Approved (08/04/2017)	Part operational / part still to be constructed. Following phased programme.	6.4	http://planning.breckland.gov.uk/OcellaWeb/planningDetails?reference=3PL/2012/0576/O&from=planningSearch	Complete/high	No	Development at Swan's Nest on the south-side of Swaffham would have a limited influence on the cumulative situation owing to separation distance and limited inter-visibility with Norfolk Vanguard onshore infrastructure. The site is set on the southern side of the town. The potential for significant cumulative effects to arise in conjunction with this project are limited and therefore it is not included in the CIA.

160. The approach to CIA follows a two- stage process. Firstly, all the impacts from previous sections are presented in Table 29.14 below and assessed for potential to act cumulatively with other projects. Secondly, a detailed assessment of these potential impacts is carried out in Table 29.15, Table 29.16 and Table 29.17 in respect of the relevant landscape and visual receptors.

Table 29.14 Potential cumulative impacts

Impact	Potential for cumulative impact	Proximity between projects	Rationale
Construction at landfall	No	Norfolk Boreas adjacent to Norfolk Vanguard.	The Norfolk Vanguard landfall construction works would not take place at the same time as the Norfolk Boreas landfall construction works. There would, therefore, be no potential for a cumulative effect.
Construction of onshore cable route	No	Norfolk Boreas onshore cable route coinciding with Norfolk Vanguard onshore cable route.	The Norfolk Vanguard DCO application would include for the laying of Norfolk Boreas ducts. As the construction works would take place concurrently and as part of the same application there would be no cumulative effect.
	Yes	Hornsea Project Three onshore cable route to cross Norfolk Vanguard onshore cable route north of Reephham.	There is the potential that the construction of the Hornsea Three onshore cable route could be constructed at the same time as the Norfolk Vanguard onshore cable route. The potential for cumulative effects is assessed in Tables 29.15 and 29.16 below.
Construction of onshore project substation and National Grid substation extension	No	Norfolk Boreas onshore project substation east of Norfolk Vanguard onshore project substation and Norfolk Boreas National Grid substation extension east of Dudgeon substation.	The construction of the Norfolk Vanguard onshore project substation and National Grid substation extension would not take place at the same time as the construction of the Norfolk Boreas onshore project substation and its associated National Grid substation extension. There would be no cumulative effect.
Operation of landfall	No	Norfolk Boreas landfall adjacent to Norfolk Vanguard landfall.	During the operational phase of Norfolk Vanguard landfall, there would be no visible elements other than very small-scale link boxes. There would be no potential for significant cumulative effects to arise.
Operation of onshore cable	No	Norfolk Boreas onshore cable route coinciding with Norfolk Vanguard onshore cable route.	During the operational phase of Norfolk Vanguard onshore cable route, there would be no visible elements

Impact	Potential for cumulative impact	Proximity between projects	Rationale
route		Vanguard onshore cable route. Hornsea Project Three onshore cable route to cross Norfolk Vanguard onshore cable route north-east of Reepham and construction compounds located near disused Oulton Airfield.	other than link boxes and the re-establishing gaps in hedgerows. There would be no potential for significant cumulative effects to arise.
Operation of onshore project substation and National Grid substation extension	Yes	Norfolk Boreas onshore project substation east of Norfolk Vanguard onshore project substation and Norfolk Boreas National Grid substation extension east of Dudgeon substation.	There is the potential that Norfolk Vanguard onshore project substation and National Grid substation extension, and Norfolk Boreas onshore project substation and National Grid substation extension would be operational concurrently and this could give rise to significant cumulative effects.
Operation of overhead modification works	No	Overhead line modification works located 0.8km from Norfolk Vanguard onshore project substation.	During the operational phase, the overhead line modification works would have a limited effect on the cumulative situation and therefore would have limited potential to give rise to significant cumulative effects.
Decommissioning	The detail and scope of the decommissioning works will be determined by the relevant legislation and guidance at the time of decommissioning and agreed with the regulator. A decommissioning plan will be provided. As such, cumulative impacts during the decommissioning stage are assumed to be no worse than those identified during the construction stage.		

161. Table 29.16 presents the potential cumulative impacts in respect of the construction phase of Norfolk Vanguard onshore cable route in conjunction with the Hornsea Project Three onshore cable route. Table 29.17 presents the cumulative impacts of the operational phase of Norfolk Vanguard onshore project substation and National Grid substation extension with the operational phase of the Norfolk Boreas onshore project substation and National Grid substation extension.
162. Visualisations show the Norfolk Vanguard onshore project substation and National Grid substation extension in conjunction with Norfolk Boreas onshore project substation and National Grid substation extension in Figures 29.13 to 29.24. These represent the views from local visual receptors and are shown both without mitigation planting and with mitigation planting 20 years into the operational phase.

163. Table 29.15 below provides a preliminary assessment of the potential cumulative impacts. Some of the viewpoints are discounted from the detailed cumulative assessment owing to the limited extent to which the Norfolk Vanguard onshore project substation or National Grid substation extension would be visible, either as a result of distance, the screening effect of intervening woodland or the screening effect of the substations of one another. In these instances, the impacts are assessed as not significant. The shaded cells in the table indicate which viewpoints are to be assessed in detail.

Table 29.15 Preliminary assessment of potential cumulative impacts

Viewpoint	Influence of cumulative developments	Potential for significant cumulative effects
VP1 Ivy Todd Road west	Norfolk Boreas onshore project substation would be visible from this viewpoint and associated section of the road.	Yes – there is the potential for a significant cumulative effect to arise.
VP2 Lodge Lane south	Norfolk Boreas onshore project substation and National Grid substation extension would be visible from this viewpoint and associated section of path.	Yes– there is the potential for a significant cumulative effect to arise.
VP3 Lodge lane north	Norfolk Boreas onshore project substation and National Grid substation extension would be visible from this viewpoint and associated section of path.	Yes– there is the potential for a significant cumulative effect to arise.
VP4 A47 Necton Substation	Only Norfolk Vanguard National Grid substation extension would be visible from this viewpoint and associated section of the A47.	No - no other cumulative developments would be visible.
VP5 A47 Spicer’s Corner	Norfolk Boreas onshore project substation and National Grid substation extension would be visible from this viewpoint and associated section of road.	Yes – there is the potential for a significant cumulative effect to arise.
VP6 A47 Top Farm	Norfolk Boreas onshore project substation would be visible from this viewpoint and associated section of road.	Yes – there is the potential for a significant cumulative effect to arise.
VP7 Ivy Todd Road east	While Norfolk Boreas onshore project substation would be visible from this viewpoint the limited extent of visibility would limit the potential for a significant cumulative effect to arise.	No – limited potential for significant cumulative effects to arise owing to limited visibility of both developments.
VP8 Chapel Road, Necton	While Norfolk Boreas onshore project substation would be visible from this viewpoint the limited extent of visibility would limit the potential for a significant cumulative effect to arise.	No – limited potential for significant cumulative effects to arise owing to limited visibility of both developments.
VP9 St Andrews Lane, Necton	Norfolk Boreas National Grid substation extension would not be visible from this viewpoint but would potentially be visible from associated properties in the area. Visibility of Norfolk Vanguard National Grid substation extension would be limited.	No – limited potential for significant cumulative effects to arise owing to limited visibility of Norfolk Vanguard National Grid substation extension.

Viewpoint	Influence of cumulative developments	Potential for significant cumulative effects
VP10 Holme Hale	Norfolk Boreas National Grid substation extension would be visible from this viewpoint but owing to the limited visibility of Norfolk Vanguard National Grid substation extension, would limit the potential for a significant cumulative effect to arise.	No – limited potential for significant cumulative effects to arise owing to limited visibility of Norfolk Vanguard National Grid substation extension.
VP11 Hale Road east of Holme Hale Hall	Norfolk Boreas National Grid substation extension would be visible from this viewpoint but owing to the limited visibility of Norfolk Vanguard National Grid substation extension, the potential for a significant cumulative effect to arise would be limited.	No – limited potential for significant cumulative effects to arise owing to limited visibility of Norfolk Vanguard National Grid substation extension.
VP12 Ivy Todd	Norfolk Vanguard onshore project substation may be partly visible from very localised parts on the northern edge of the hamlet. Visibility of Norfolk Boreas onshore project substation would be limited and the National Grid substation extensions would not be visible.	No – limited potential for significant cumulative effects to arise owing to limited visibility of Norfolk Vanguard and Norfolk Boreas onshore project substations.

29.8.1 Cumulative Impacts – Onshore Cable Route

164. The cumulative impact of the onshore cable route in conjunction with Hornsea Project Three onshore cable route during the construction phase would relate to the presence and activity of the construction plant, the presence of the trenches and the presence of the associated compounds and running tracks, and the influence these would have on landscape character and visual amenity.
165. Whilst the exact location of the Hornsea Project Three onshore cable route has not been precisely defined, the onshore cable corridor shown as part of the PEIR submission indicates an intersection with the Norfolk Vanguard onshore cable route to the north-east of Reepham in an agricultural area to the north of Marriott's Way and south of Salle Park. The Hornsea Project Three onshore cable corridor follows a north to south alignment from Weybourne on the north coast to Swardeston to the south of Norfolk, while the Norfolk Vanguard onshore cable route follows an east to west alignment from Happisburgh to Necton. It is only in this one location that the onshore cable routes intersect.
166. The construction of the Norfolk Vanguard onshore cable route would comprise an initial stage during which the trench would be excavated, the ducts installed and the ground reinstated, and a later stage during which the cables would be pulled through the ducts. Although the overall construction window for the onshore cable route is 2 years, construction works would occur in this area for two short periods during the earlier and later stages. The likelihood of these works coinciding with a

similar programme of works for Hornsea Project Three is limited, but a potential overlap of construction works has been assessed to ensure the worst-case scenario is considered.

167. While there is also the potential for a significant cumulative effect to arise in respect of the proximity of the Hornsea Project Three construction compound potentially to be located at Oulton Airfield, and the Norfolk Vanguard construction compound, potentially to be located south of Heydon Road to the south-east of Oulton Airfield, this potential is moderated by the baseline character of these locations. Both are characterised by large areas of concrete hardstanding and the presence of farm buildings. The use of these locations for the storage of materials and plant, as well as possibly site offices, welfare facilities and associated temporary infrastructure, would present a limited magnitude of change as these locations already constitute developed farmland and the change in appearance would not be so notable. Furthermore, visibility of the Norfolk Vanguard construction compound would be largely limited to road-users on Heydon Road from which the mature and well-tended hedgerows and hedgetrees would be likely to form an effective screen. There is, therefore, limited potential for a cumulative effect to arise in respect of the construction compounds.
168. The cumulative impact of the construction of the Norfolk Vanguard onshore cable route and Hornsea Project Three onshore cable route would relate principally to the following features of the proposed projects.
- The effect on landscape character and visual amenity owing to the presence of the two onshore cable routes crossing in this area.
 - The effect on landscape character and visual amenity owing to the presence of two mobilisation areas associated with Hornsea Project Three.
 - The effect of the re-establishment of hedgerows over cable easements.
169. Mitigation measures associated with the onshore cable route would comprise planting as outlined in section 29.7.1 and described in more detail in the OLEMS (document reference 8.7). This would involve the re-establishment of hedgerows where removals had occurred and the reinstatement of the agricultural land. It is assumed that Hornsea Project Three would implement similar mitigation measures following construction of their onshore cable route and associated infrastructure.
170. Table 29.16 shows the detail of the assessment for each receptor. In summary, the construction of the Norfolk Vanguard onshore cable route in addition to the Hornsea Project Three onshore cable route would have a short term significant cumulative effect on the views of walkers on an approximate 200m section of Marriott's Way, but would not have significant effects on the remaining parts of this route or on any other landscape or visual receptors, including nearby Salle Park and the B1145.

Table 29.16 Potential cumulative impact - onshore cable route

Receptor	Baseline	Sensitivity	Magnitude of Cumulative Change	Significance of Cumulative Effect	Duration of Cumulative Effect
Onshore cable route – Landscape Receptors					
Salle Park	<p>Salle Park is a designated landscape in Historic England’s ‘Register of Parks and Gardens’. It is located approximately 2km north-east of Reepham and to the immediate north of the B1145 with minor roads to the west and east. The surrounding landscape comprises arable farmland and the landform falls gently from south-west to north-east. The designed landscape is set around Salle Hall, an 18th century Palladian country house, and includes formal gardens and a walled kitchen garden. Historic England’s description states ‘<i>it enjoys a very rural setting and is almost entirely surrounded by dense perimeter plantations.</i>’ This enclosure limits the visual association between the designed landscape and the surrounding landscape although the south-east drive emerges at the corner closest to the proposed project and a gothic</p>	<p>The sensitivity of Salle Park to the proposed project is medium to high.</p> <p>The value of Salle Park is high. Its inclusion in the Register of Parks and Gardens denotes its national importance.</p> <p>The susceptibility of Salle Park to the proposed project is medium. The designed landscape is enclosed by dense woodland such that there is no visibility of the landscape to the east where the mobilisation area would be located and the south-east where the onshore cable route construction would take place. The only potential for visibility would occur from the south-east corner where the gated entrance to the south-east drive occurs, although its recessed location within mature tree cover combined with the hedgerow enclosure along the B1145 would limit any such potential.</p>	<p>The cumulative magnitude of change on Salle Park as a result of the proposed project would be low.</p> <p>There would be no visibility of the proposed project from the designed landscape owing to the maturity and density of the perimeter planting along the southern and eastern boundaries. At the south-east gated entrance, the potential for visibility is limited by enclosing tree and hedgerow cover, and if visibility were to occur the construction works would appear relatively small in scale. While the Norfolk Vanguard mobilisation area and onshore cable route construction would potentially have an impact on the setting of the designed landscape, from the B1145, where the impacts would occur, the hedgerows would screen much of the construction works with the exception of where a 20m to 25m break would be formed at the crossing point.</p> <p>The Hornsea Project Three mobilisation area to the south of the south-west corner of Salle Park would</p>	<p>Not significant.</p> <p>The combination of the medium to high sensitivity and the low magnitude of change would lead to a not significant effect. The mature enclosure around Salle Park means that both projects would have an almost negligible effect on views from within and a low effect on the setting of the designated landscape.</p>	<p>Short term and reversible in respect of onshore cable route construction.</p> <p>Medium term and reversible in respect of presence of the mobilisation area and hedgerow re-establishment.</p>

Receptor	Baseline	Sensitivity	Magnitude of Cumulative Change	Significance of Cumulative Effect	Duration of Cumulative Effect
	cottage, Cawston Lodge, is located on the opposite side of the B1145 to this entrance.		potentially be visible from the small open section of the designed landscape located adjacent to the B1145, but would not give rise to a cumulative effect.		
Onshore cable route – Visual Receptors					
B1145 (west of Cawston)	The B1145 connects King’s Lynn in the west with Mundesley in the east. The onshore cable route would cross the B1145 approximately 200m north-east of Reephams and then again to the immediate east of Salle Park, where a mobilisation area would also be located. The B1145 to the north-east of Reephams is mostly enclosed by mature and continuous hedgerow, such that views beyond the road are limited. A more open section occurs around the bend to the west of Salle Park where views south open up. To the east of Salle Park, the north side of this section of the B1145 is enclosed by hedgerow. This forms an almost continuous screen to	<p>The sensitivity of the views of road-users on this section of the B1145 is medium.</p> <p>The value of the views from the road is medium. There are no formal viewpoints and the views are not representative of a designated landscape. Views towards the wooded boundary of Salle Park are evident to west-bound road-users and this adds to the value although the designed landscape is screened by the trees.</p> <p>The views are largely enclosed by roadside vegetation, and this reduces the susceptibility of road-users to the proposed project in the adjacent fields. Glimpsed views would, however, be experienced, to reveal the presence of the</p>	<p>The cumulative magnitude of change on road-users as a result of the Norfolk Vanguard onshore cable route in addition to the Hornsea Project Three onshore cable route would be medium to low or no effect.</p> <p>Whilst the presence of the mobilisation area to the east of Salle Park would give rise to a singular significant effect, as assessed in the main assessment in Table 29.9, there would be no influence from Hornsea Three Project along this section and therefore there would be no cumulative effect. To the west of Salle Park, where the B1145 bends towards the south, the absence of hedgerow ensures an open view for road-users towards the mobilisation area and onshore cable route of Hornsea Project Three. The separation distance of Norfolk Vanguard onshore cable route combined with the</p>	Not significant. The combination of the medium sensitivity and the medium to low magnitude of change would lead to a not significant effect. Although the two projects would come into close proximity to each other and the B1145, the limited extent to which they would be seen in combination limits the potential for a significant cumulative effect to arise.	Short term and reversible in respect of onshore cable route construction. Medium term and reversible in respect of mobilisation area and hedgerow re-establishment.

Receptor	Baseline	Sensitivity	Magnitude of Cumulative Change	Significance of Cumulative Effect	Duration of Cumulative Effect
	road-users, apart from where a 15m opening occurs, which allows views across the adjacent arable farmland. The vegetation on the south-side is more fragmented with sections of hedgerow and scrubby vegetation, such that some views into the adjacent young woodland plantation can be gained.	Norfolk Vanguard mobilisation area to the north of the B1145 and the Hornsea Project Three mobilisation area to the south, albeit from the sections to the east and west of Salle Park respectively.	relatively small scale of its construction works would mean the cumulative magnitude of change would be medium to low. As the B1145 approaches Reepham, the enclosure of the hedgerow on either side of the road would limit visibility of both projects and it would only be the 20m to 25m sections removed on either side for the construction of Norfolk Vanguard onshore cable route that would add to the cumulative effect. The limited extent of the removals and the screening of the wider operations would ensure a magnitude of change of medium to low.		
Marriott's Way	Marriott's Way connects Norwich and Aylsham along disused railway lines. It passes into the 1.045km wide study area to the west of Aylsham and follows the south-west alignment of the cable route over an approximate 13km stretch, before it passes out of the study area to the west of Reepham. Those sections of relevance to this assessment occur to the east of Reepham, where the Norfolk Vanguard	The sensitivity of the views of recreational users on Marriott's Way is medium to high . Marriott's Way is a long distance recreational route which connects with NCR 1 near Reepham. The sections of route within the study area are not located within or overlooking any national, regional or local scenic designations or recognised scenic views which might signify heightened value. The susceptibility of	The cumulative magnitude of change as a result of the addition of the proposed project to the cumulative situation would be medium to low . The most notable impact would occur where Hornsea Project Three onshore cable route would cross Marriott's Way, although it is not clear at this stage if this would involve open trenching or trenchless crossing (e.g. HDD). Whilst the construction of the Norfolk Vanguard onshore cable route, singularly would not have a notable effect on Marriott's Way, in addition to	Not significant with the exception of a localised significant effect over an approximate 100m section centred on the intersection with the Hornsea Project Three onshore cable route. The combination of the medium to high sensitivity and the medium to low	Short term and reversible in respect of onshore cable route construction. Localised significant cumulative effects lasting the short term of overlapping construction phases, reducing

Receptor	Baseline	Sensitivity	Magnitude of Cumulative Change	Significance of Cumulative Effect	Duration of Cumulative Effect
	<p>onshore cable route comes close and the Hornsea Project Three onshore cable route intersects the path.</p> <p>The section of Marriott's Way to the east of Reepham is largely enclosed by mature tree cover, often dense in parts albeit potentially with some gaps from which glimpsed views of the surrounding arable farmland to the north and south is visible. The character along this section of Marriott's Way is typically rural with little development evident other than typical small scale rural development. At either end the urban areas of Reepham and Cawston, present a contrasting built-up character.</p>	<p>recreational users on this route is influenced by the potential proximity and level of visibility of the onshore cable routes. Hornsea Three Project would cross Marriott's Way to the south of Salle Park, while the Norfolk Vanguard project would run parallel to the path, in the arable farmland to the north.</p> <p>The expectations of recreational users of this route would typically be to enjoy the rural landscape and this increases their susceptibility to the construction works, which overall is considered to be medium to high.</p>	<p>the effects of the Hornsea Project Three, the cumulative magnitude of change would be medium to low. This effect would be moderated by the extent of enclosure around much of the path and the separation distance between the path and the onshore cable route.</p>	<p>magnitude of change would lead to a significant effect. The effect on the remainder of the route would be not significant largely owing to the enclosure around the route and separation distance from construction works.</p>	<p>to not significant post construction. Medium term and reversible in respect of the re-instatement of hedgerows.</p>

29.8.2 Cumulative Impacts - Onshore project substation and National Grid substation extension

171. The cumulative impact of the onshore project substation and the National Grid substation extension in conjunction with Norfolk Boreas onshore project substation and National Grid substation extension during the operational phase would relate to the presence of the sites and their component parts, and the influence these would have on landscape character and visual amenity. The Norfolk Vanguard onshore project substation would be located west of the Norfolk Boreas onshore project substation. The Norfolk Vanguard National Grid substation extension would be located to the west of the Dudgeon Substation, while the Norfolk Boreas National Grid substation extension would be located to the east.
172. The cumulative impact of the Norfolk Vanguard onshore project substation and National Grid substation extension with the Norfolk Boreas onshore project substation and National Grid substation extension would relate principally to the following features of the proposed projects.
- The effect on landscape character and visual amenity owing to the presence of the two adjacent onshore project substations, fenced and surfaced with converter halls up to 19m in height, and lightning protection masts to 25m, each occupying a site of 250m x 300m.
 - The effect on landscape character and visual amenity owing to the presence of the Norfolk Vanguard National Grid substation extension (145m x 200m) and Norfolk Boreas National Grid substation extension (145m x 130m) both up to 15m in height.
 - The effect of the re-establishment of hedgerows over cable easements and adjacent to the A47.
 - The effect of mitigation planting, associated with both Norfolk Vanguard and Norfolk Boreas, in terms of its screening of the onshore project substations and National Grid substation extensions.
173. Mitigation measures associated with the onshore project substation and National Grid substation extension would comprise planting and earthworks as described in section 29.7.1 and illustrated on Figures 29.9a, 29.10b and 29.11b.
174. Table 29.17 shows the detail of the assessment for each receptor. In summary, the onshore project substation and National Grid substation extension for Norfolk Vanguard in conjunction with the onshore project substation and National Grid substation extension for Norfolk Boreas would have a significant cumulative effect on landscape character in the localised parts of the Settled Tributary Farmland LCT – River Wissey Tributary Farmland LCU and Plateau Farmland LCT – Beeston Plateau LCU and Pickenham Plateau LCU but would not have significant effects on the

remaining parts and all other LCUs. In respect of the representative viewpoints, significant cumulative effects would arise from Lodge Lane to the immediate south of the site and a very localised section of Ivy Todd Road to the south-west. These effects would all occur within 1.2km of the onshore project substation, making them localised.

175. Embedded mitigation planting for Norfolk Boreas and Norfolk Vanguard would be expected to reduce the cumulative visual effects from Viewpoint 2 – Lodge Lane south, and Viewpoint 3 – Lodge Lane north, over the first 20 years of operation. It would achieve a sufficient height, relative to the scale of the HVDC onshore project substations, to mitigate the effects on the views of walkers on this path.

29.8.3 Cumulative Impacts During Decommissioning

176. Decommissioning of Norfolk Boreas and Hornsea Project Three may potentially take place at the same time as the Norfolk Vanguard project. The detail and scope of the decommissioning works for the Norfolk Vanguard project will be determined by the relevant legislation and guidance at the time of decommissioning and agreed with the regulator. A decommissioning plan will be provided. As such, cumulative impacts during the decommissioning stage are assumed to be no worse than those identified during the construction stage.

Table 29.17 Potential cumulative impacts - onshore project substation and National Grid substation extension

Receptor	Baseline	Sensitivity	Magnitude of Cumulative Change	Significance of Cumulative Effect	Duration of Cumulative Effect
Landscape Receptors					
Plateau Farmland LCT – Pickenham Plateau LCU	<p>The National Grid substation extensions would be located in the Pickenham Plateau LCU, the Norfolk Vanguard onshore project substation in the River Wissey LCU to the immediate east and the Norfolk Boreas onshore project substation in the Beeston Plateau further east. This LCU covers an extensive plateau area extending across the north-west of the study area. The National Grid substation extensions would be located in the southern most 'spur' which lies to the immediate west of the narrow River Wissey Tributary Farmland. This spur forms a relatively level area of land which has been utilised for the development of Necton National Grid substation and Dudgeon substation. The overhead line extends along this spur to the north-west. The LCU is characterised by large fields of arable with limited enclosure.</p>	<p>The sensitivity of this LCU to the cumulative effects of the project is medium. The value of the LCU is medium – it is not covered by any landscape designations which might otherwise denote a special value. The landscape has been modified by agricultural practices and hedgerow loss has eroded the historic pattern of enclosure. The susceptibility of the LCU to the cumulative effects is medium. Although the National Grid substation extensions would be located in this LCU, and the two onshore project substations in the adjacent LCUs, it would occupy only a localised part of the much wider LCU. The susceptibility is moderated by the modified nature of the farmland and there is also an existing influence from the Necton National Grid substation,</p>	<p>The cumulative magnitude of change would be medium to high within the local area, medium within the surrounding area and low or no effect across the wider LCU. The cumulative magnitude of change would be medium to high owing to the scale and extent of the additional developments, despite the existing influence on landscape character from Necton National Grid substation and Dudgeon substation. The addition of the National Grid substation extensions, to the Necton National Grid substation and Dudgeon substation would collectively form one very large energy development in this LCU. The presence of Norfolk Vanguard onshore project substation and Norfolk Boreas onshore project substation in the adjacent LCUs would form a second large scale cluster, which would have indirect effects on the character of the LCU by increasing the spread of energy developments into the adjacent landscape. The clusters would be close enough to prevent the spread of development into the wider landscape,</p>	<p>Not significant with the exception of a localised significant effect in the area of the spur. The combination of the medium sensitivity and the high magnitude of change would lead to a significant effect. Tree cover along the A47 would limit the northern influence of this landscape effect.</p>	<p>Long term and reversible. Localised significant cumulative effects lasting for 20 years reducing to not significant for the remaining 10 years of the 30 year indicative design life.</p>

Receptor	Baseline	Sensitivity	Magnitude of Cumulative Change	Significance of Cumulative Effect	Duration of Cumulative Effect
	The A47 has a localised influence on the southern part of the spur, despite the enclosure of tree cover.	Dudgeon substation, and associated overhead lines in the wider landscape.	while the gap of approximately 500m would be enough to keep the clusters separate and prevent coalescence into one even larger group.		
Settled Tributary Farmland LCT – River Wissey Tributary Farmland LCU	The Norfolk Vanguard onshore project substation would be located in the River Wissey Tributary Farmland LCU, the National Grid substation extensions in the Pickenham Plateau LCU and the Norfolk Boreas onshore project substation in the Beeston Plateau LCU. The landform of the local area is typical of the wider LCU with the valley sides sloping down towards the unnamed river course. The land use is predominantly arable farmland, albeit with a pattern of enclosure which has been eroded in parts. Views are generally medium range, contained within the wider valley with some closer range enclosure where mature woodland and hedgerows occur. Necton National Grid substation and Dudgeon substation are located to the	<p>The sensitivity of this LCU to the cumulative effects of the project is medium.</p> <p>The value of the LCU is medium – it is not covered by any landscape designations which might otherwise denote a special value. The landscape has been modified by agricultural practices and hedgerow loss has eroded the historic pattern of enclosure.</p> <p>The susceptibility of the LCU to the cumulative effects is medium. While Norfolk Vanguard onshore project substation would be located in this LCU and Norfolk Boreas onshore project substation in the adjacent Beeston Plateau LCU, their sites would occupy only a small proportion of the much wider LCU and occur in an area that has been modified by intensive farming practices. While the character is</p>	<p>The cumulative magnitude of change would be medium to high within the local area, medium within the surrounding area and low or no effect across the wider LCU.</p> <p>The cumulative effect on the LCU would relate to the direct effect of the Norfolk Vanguard onshore project substation and the indirect effects of the Norfolk Boreas onshore project substation, National Grid substation extensions, Necton National Grid substation and Dudgeon substation in adjacent LCUs. The concentration of these large scale energy developments, in and around this LCU, would collectively detract from the strength of the underlying rural character, despite there being a baseline influence from existing energy developments in the Pickenham Plateau LCU. The scale and extent of these developments would give rise to a local landscape defined by energy developments.</p>	Not significant with the exception of a localised significant effect in the area defined by the A47 to the north, Great Wood and Smuggler’s Lane to the east, Necton National Grid Substation and the Necton ridgeline to the west and Ivy Todd Road to the south. The combination of the medium sensitivity and high magnitude of change would lead to a significant effect.	Long term and reversible. Localised significant cumulative effects lasting for 20 years reducing to not significant for the remaining 10 years of the 30 year indicative design life.

Receptor	Baseline	Sensitivity	Magnitude of Cumulative Change	Significance of Cumulative Effect	Duration of Cumulative Effect
	north-west of the onshore project substation sites, which, along with the associated overhead lines establishes energy developments as a part of the baseline landscape.	predominantly rural, there is a baseline influence from the existing Necton National Grid substation, Dudgeon substation and associated overhead lines.			
Plateau Farmland LCT – Beeston Plateau LCU	The Norfolk Boreas onshore project substation would be located in the Beeston Plateau LCU, the Norfolk Vanguard onshore project substation in the adjacent River Wissey Tributary Farmland LCU and the National Grid substation extensions in the Pickenham Plateau. The distinction between the LCUs in this transitional area is subtle, with the landform rounding off from the steeper valley into the flatter plateau. The land use is similarly arable farmland and enclosure is mostly complete, albeit with some loss causing a larger field pattern in parts. This local area is characterised by the mature Necton Wood in the adjoining Tributary Farmland LCU and other blocks in the Plateau Farmland LCU to	<p>The sensitivity of this LCU to the cumulative effects of the onshore project substations is medium.</p> <p>The value of the LCU is medium – it is not covered by any landscape designations which would otherwise denote a special value.</p> <p>The susceptibility of the LCU to the cumulative effects of the project is medium. While Norfolk Boreas onshore project substation would be located in this LCU and Norfolk Vanguard onshore project substation in the adjacent Tributary Farmland LCU, their sites would occupy only a small proportion of the much wider LCUs and occur in an area that has been modified by intensive farming practices. While the character is predominantly rural, there is a</p>	<p>The magnitude of change would be medium to high within the local area, medium within the surrounding area and low or no effect across the wider LCU.</p> <p>The cumulative effect on the LCU would relate to the direct effect of the Norfolk Boreas onshore project substation and the indirect effects of the Norfolk Vanguard onshore project substation, National Grid substation extension, Necton National Grid substation and Dudgeon substation in adjacent LCUs. The concentration of these large scale energy developments, in and around this LCU, would collectively detract from the strength of the underlying rural character, despite there being a baseline influence from existing energy developments in the Pickenham Plateau LCU. The scale and extent of these developments would give rise to a local landscape defined by energy</p>	Not significant with the exception of a localised significant effect in the area defined by the A47 to the north, Great Wood and Smuggler’s Lane to the east, and the LCU boundary to the west and south. The combination of the medium sensitivity and the medium to high magnitude of change.	Long term and reversible. Localised significant cumulative effects lasting for 20 years reducing to not significant for the remaining 10 years of the 30 year indicative design life.

Receptor	Baseline	Sensitivity	Magnitude of Cumulative Change	Significance of Cumulative Effect	Duration of Cumulative Effect
	the north and south.	baseline influence from the existing Necton National Grid substation, Dudgeon substation and associated overhead lines.	developments.		
Visual Receptors					
VP1 Ivy Todd Road west	This viewpoint is located on Ivy Todd Road, midway between the village of Necton and the hamlet of Ivy Todd at a point where a gated access track leads north through the adjacent farmland. The view is intended to be representative of the views of road-users, although the road is enclosed by mature hedgerows along much of its length, such that views are largely contained. This gated opening provides one of the few glimpsed views towards the onshore project substation sites. Located on a localised high point, the landform falls away to the north-east where Norfolk Vanguard and Norfolk Boreas onshore project substations would be located. Necton National Grid substation and Dudgeon substation are not readily visible from this	<p>The sensitivity of road-users on this minor road to the cumulative effects of the project would be medium.</p> <p>The value of the view would be medium to low. The view is not from a formal viewpoint and is not representative of any designated landscapes.</p> <p>The susceptibility of road-users would be medium. While much of the road is enclosed by hedgerow, the alignment of this opening means that east-bound road-users would experience this view, albeit for a very short duration. In winter months, filtered views through the hedgerow may be experienced and if the hedgerow were to be cut low, wider views would perhaps open up from the elevated section near the viewpoint.</p>	<p>The cumulative magnitude of change would be medium over an approximate 10m section where the field opening occurs and low or no effect over all remaining parts.</p> <p>The photomontage in Figure 29.13d shows how the onshore project substations would be located along the ridgeline on the opposite side of the valley. Norfolk Vanguard would be seen to the fore of Norfolk Boreas and would screen almost half of Norfolk Boreas, with intervening planting adding to the reduced visibility, which in turn would moderate the cumulative effect. The combined effect would, nonetheless, appear notable, owing to the broad horizontal extent and the prominence of the HVDC converter halls, especially where they extend above the treeline. The onshore project substations would appear at variance with the rural character of the baseline view, owing to their large</p>	Significant over an approximate 10m section where the field opening occurs. The combination of the medium sensitivity and the medium cumulative magnitude of change would lead to a localised significant effect. The effect on views from the remainder of Ivy Todd Road between Necton and Ivy Todd would be not significant .	Long term and reversible. Localised significant cumulative effects lasting for 25 years reducing to not significant for the remaining 5 years of the 30 year indicative design life.

Receptor	Baseline	Sensitivity	Magnitude of Cumulative Change	Significance of Cumulative Effect	Duration of Cumulative Effect
	viewpoint, although the overhead line is.		mass and scale. The extent of the medium cumulative magnitude of change would be contained within the very short section of road from which this open view would be experienced. From the remainder of the road between Necton and Ivy Todd the magnitude of change would be low, negligible or no effect, although there is potential that this could increase in elevated sections if hedgerows were cut low.		
VP2 Lodge Lane south	This viewpoint is located on Lodge Lane to the north of the hamlet of Ivy Todd. It looks north-east across the arable farmland towards the onshore project substation sites at a range of approximately 610m. The view is representative of the views of walkers in this area and features the Necton National Grid substation and Dudgeon substation which, along with the associated overhead line, form readily apparent developments along the skyline to the north-east. The view to the north is contained in the middle range	The sensitivity of walkers on Lodge Lane to the cumulative effects of the project is medium . The value of the view is medium to low. The view is not from a formal viewpoint and is not representative of any landscape designations. The existing Necton National Grid substation, Dudgeon substation and overhead line are evident, and these make large scale electricity development a feature of the baseline views from Lodge Lane. The susceptibility of walkers is medium. Access on the lane	The cumulative magnitude of change would be medium to high . Figure 29.14d shows how Norfolk Vanguard and Norfolk Boreas would both be seen at their longest horizontal extent, which, when combined, would occupy almost all of the 53.5-degree frame. The cumulative effect would, however, be moderated by the combined screening effect of intervening landform and vegetation. The convex shape of the landform means that the majority of the onshore project substations would be located over the ridgeline. The more southerly parts, which would be visible, would be partly screened by intervening vegetation. These factors reduce the	Significant over the approximate 550m southern section of Lodge Lane. The combination of the medium sensitivity and the medium to high magnitude of change would lead to a localised significant effect. Effect beneficial after 20 years as mitigation planting would enhance visual amenity of area. The effects on the remaining northern	Long term and reversible. Localised significant cumulative effects lasting for 20 years reducing to not significant for the remaining 10 years of the 30 year indicative design life.

Receptor	Baseline	Sensitivity	Magnitude of Cumulative Change	Significance of Cumulative Effect	Duration of Cumulative Effect
	by the subtle relief of the landform and enclosure of hedgerows. Hedgerows and tree cover are depleted within the farmland but more substantial around Ivy Todd to the south.	provides only a short walk as it does not connect with the wider PRoW network. The experience of walkers is already influenced by the existing electricity developments although this viewpoint would be closer to the onshore project substations.	<p>prominence of the onshore project substations, especially Norfolk Boreas on the right. The comparison with the closer range vegetation would also help to reduce the perceived scale of the HVDC converter halls. The horizontal spread would nonetheless be notable and the cumulative magnitude of change would be medium to high for much of the length of Lodge Lane owing to the relatively open views.</p> <p>The National Grid substation extension would not add to the cumulative magnitude of change, because of its location to the rear of the existing National Grid and Dudgeon Substations, which would largely screen its extent.</p>	part of Lodge Lane is assessed under Viewpoint 3 below.	
VP3 Lodge lane north	<p>This viewpoint is located at the northern end of Lodge Lane to the north of the hamlet of Ivy Todd. It is not a PRoW but is shown on OS mapping as a route with public access. The view looks north towards the mature tree cover that encloses Lodge Farm.</p> <p>The view is representative of the views of walkers in this area</p>	<p>The sensitivity of walkers on Lodge Lane to the cumulative effects of the project is medium.</p> <p>The value of the view is medium to low. The view is not from a formal viewpoint and is not representative of any landscape designations. The existing Necton National Grid substation, Dudgeon substation</p>	<p>The cumulative magnitude of change as a result of the operational project would be medium to low.</p> <p>Figure 29.15d shows how Norfolk Boreas onshore project substation would be mostly concealed by intervening landform and vegetation, such that only parts of the converter halls and the lightning protection masts would be visible to the right of the mature trees that enclose Lodge</p>	The cumulative effect would be not significant in the northern section of Lodge Lane for approximately 250m. The combination of the medium sensitivity and medium to low cumulative	Long term and reversible.

Receptor	Baseline	Sensitivity	Magnitude of Cumulative Change	Significance of Cumulative Effect	Duration of Cumulative Effect
	and features Necton National Grid substation and Dudgeon substation which, along with the associated overhead line, form readily apparent developments along the skyline to the north-east. To the north, the view is contained in the middle range by the subtle relief of the landform and enclosure of hedgerows. Hedgerows and tree cover are depleted within the farmland but more substantial around Ivy Todd to the south.	and overhead line are evident, and these make large scale electricity developments a feature of the baseline views from Lodge Lane. The susceptibility of walkers is medium. Access on the lane provides only a short walk as it does not connect with the wider PRoW network. The experience of walkers is already influenced by the existing electricity developments although this viewpoint would be close to the onshore project substations.	Farm. The cumulative effect of these onshore project substations would be medium to low. While collectively they span a notable horizontal extent along the ridgeline, the extent to which they are screened by intervening landform and vegetation notably reduces their combined effect. The limited visibility of Norfolk Vanguard and Norfolk Boreas limits the overall potential for a notable cumulative effect to arise. The National Grid substation extension does not add to the cumulative magnitude of change owing to the extent to which it would be screened by the intervening presence of the Dudgeon Substation and Necton Substation.	magnitude of change would lead to a not significant effect. Effect beneficial after 20 years as mitigation planting would enhance visual amenity of area.	
VP5 A47 Spicer's Corner	This viewpoint is located opposite Spicer's Corner layby on the A47. It represents the views of road-users on the A47 which are filtered by bare trees in the winter and screened by leafed trees in the summer. While there are some open sections where views into the adjacent landscape can be experienced, mitigation planting associated with the Dudgeon	The sensitivity of road-users on the A47 to the cumulative effects of the project is medium to high . The value of the views from the A47 is medium. The A47 is not a 'scenic route' and this section does not pass through any landscape designations. There are no formal viewpoints and nearby laybys are largely	The magnitude of change from the adjacent sections of the A47 would be medium to low . The photomontage in Figure 29.17d shows how Norfolk Vanguard would be located to the fore of Norfolk Boreas with such a substantial overlap that only the left third of Norfolk Boreas would be visible. The limited visibility of Norfolk Boreas would limit the potential for a cumulative effect to arise as the effects would relate	Not significant. The combination of the medium to high sensitivity with the medium to low cumulative magnitude of change would lead to a not significant effect. The extent to which the Norfolk Boreas onshore project	Medium term and reversible.

Receptor	Baseline	Sensitivity	Magnitude of Cumulative Change	Significance of Cumulative Effect	Duration of Cumulative Effect
	substation onshore works will add further to the screening effect over time. The opening provides a view that at most would be glimpsed by passing road-users travelling at speed. The view is of arable farmland with hedgerow and woodland enclosure and expansive in extent. The existing Necton National Grid substation, Dudgeon substation and the overhead line are readily apparent in this view but not apparent to road-users on the adjacent section of the A47.	enclosed by tree cover. The susceptibility of road-users to the effects of the onshore project substations is medium to high. The extent of tree removal along the southern side of the A47 during the construction phase would open up the views of road-users and while mitigation planting associated with the Dudgeon Substation, established along the southern side of the A47, would reduce visibility, the opening at the access would allow views towards the operational onshore project substations.	principally to Norfolk Vanguard on its own and not the cumulative effect of both substations combined. By the operational phase, mitigation planting associated with the Dudgeon Substation, located along the southern side of the A47, would have reached a sufficient height to largely screen the views of road-users from the wider extent where vegetation removal would have occurred. Views towards the onshore project substation would occur from the approximate 20m to 25m wide site access opening which would potentially be reduced in extent over time as mitigation planting at either side matures. This would still be enough of an opening for road-users to get a view of the cumulative developments, albeit, transitory at speed and at an oblique angle.	substation would be screened by Norfolk Vanguard onshore project substation would limit the potential for a cumulative effect to arise. Effect beneficial after 10 years as mitigation planting would enhance visual amenity of area.	
VP6 A47 Top Farm	This viewpoint is located west of the layby on the A47 to the west of the access road to Top Farm. It represents the views of road-users on the A47 which are filtered by bare trees in the winter and screened by leafed trees in the summer. While there are some open sections,	The sensitivity of road-users on the A47 to the cumulative effect of the onshore project substations is medium . The value of the views from the A47 is medium. The A47 is not a 'scenic route' and this section does not pass through any landscape designations. There	The magnitude of change from the adjacent sections of the A47 would be low . The photomontage in Figure 29.29d shows how distant intervening vegetation would screen much of Norfolk Boreas onshore project substation and the left third of Norfolk Vanguard. The very limited visibility of	Not significant. The combination of the medium sensitivity and low cumulative magnitude of change would lead to a not significant effect. The extent to which Norfolk Boreas would	Long term and reversible.

Receptor	Baseline	Sensitivity	Magnitude of Cumulative Change	Significance of Cumulative Effect	Duration of Cumulative Effect
	<p>mitigation planting associated with the Dudgeon substation onshore works will add substantially to the screening effect over time. This gap in the enclosure provides a view that at most would be glimpsed by passing road-users travelling at speed. The view is of arable farmland with hedgerow and woodland enclosure and expansive in extent. Necton National Grid substation, Dudgeon substation and the overhead line to the right of the view, establish large-scale energy developments as part of the baseline character, although visibility from the adjacent section of the A47 would be limited.</p>	<p>are no formal viewpoints and nearby laybys are largely enclosed by tree cover.</p> <p>The susceptibility of road-users to the cumulative effects of the onshore project substations is medium to low. While roadside vegetation aligns the road between the layby and Viewpoint 5, it is thin and fragmented in parts and views through to the adjacent landscape occur, albeit fleeting and experienced whilst in transit at high speeds.</p>	<p>Norfolk Boreas would reduce the potential for a cumulative effect to arise and the visual effect would relate to the singular effect of Norfolk Vanguard onshore project substation. Glimpsed views would occur as road-users pass gaps in the roadside vegetation, but these would be short in duration and at an oblique angle to the direction of travel.</p>	<p>be screened by distant intervening tree cover and both Norfolk Boreas and Norfolk Vanguard would be screened by the A47 road-side planting, would notably reduce the potential for a cumulative effect to arise.</p> <p>Effect beneficial after 10 years as mitigation planting would enhance visual amenity of area.</p>	

29.9 Inter-relationships

29.9.1 Inter-topic relationships

177. Table 29.18 lists out the inter-relationships between this chapter and other chapters within the ES.

Table 29.18 Inter-topic relationships

Topic and description	Related Chapter	Where addressed in this Chapter	Rationale
Onshore Ecology	Chapter 22	Section 29.7 (all impacts); section 29.7.1 (embedded mitigation)	Both chapters consider the potential effects of hedgerow and tree removals, the LVIA considering the impact on hedgerows and trees as landscape elements, and the Onshore Ecology assessment considering the impact on hedgerows and trees as important ecological assets. Both chapters consider the mitigation of hedgerow and tree loss in respect of proposals to replant. The OLEMS (document reference 8.7) sets out the approach to replanting and the LVIA assesses the mitigation of landscape and visual effects.
Onshore Archaeology and Cultural Heritage	Chapter 28	Section 29.7 (all impacts); section 29.6.3 (landscape designations)	Both chapters consider the potential effects of the project on designated Registered Parks and Gardens and their setting within the landscape.
Tourism and Recreation	Chapter 30	Section 29.7 (all impacts).	Both chapters consider the potential effects of the onshore project substation, National Grid substation extension and overhead line modification on the visual amenity of recreational users in the local area.

178. Alongside the viewpoints considered for the purposes of this chapter from a landscape perspective, a number of 'heritage-specific' viewpoints were also identified in consultation with and feedback from the Norfolk County Council Historic Environment Service and Historic England. All viewpoints have taken account of the topography of the landscape within which the project infrastructure will be constructed and operated within this area of Norfolk. Visualisations have been produced from these viewpoints to inform a heritage settings assessment, which is reported on separately in Chapter 28 Onshore Archaeology and Cultural Heritage and also associated Appendix 28.7 (where the heritage specific viewpoints in relation to heritage setting and the onshore project substation are captured).

29.10 Interactions

179. The impacts identified and assessed in this chapter have the potential to interact with each other, which could give rise to synergistic impacts as a result of that interaction. The worst case impacts assessed within the chapter take these interactions into account and for the impact assessments are considered conservative and robust. For clarity the areas of interaction between impacts are presented in Table 29.19, along with an indication as to whether the interaction may give rise to synergistic impacts.

Table 29.19 Interaction between impacts

Potential interaction between impacts						
Construction	1 Loss of agricultural land	2 Loss of hedgerows and trees	3 Changes to landscape character	4 Changes to landscape designations	5 Changes to visual amenity	6 Landscape mitigation
1 Loss of agricultural land	-	Yes	Yes	Yes	Yes	Yes
2 Loss of hedgerows and trees	Yes	-	Yes	Yes	Yes	Yes
3 Changes to landscape character	Yes	Yes	-	Yes	Yes	Yes
4 Changes to landscape designations	Yes	Yes	Yes	-	Yes	Yes
5 Changes to visual amenity	Yes	Yes	Yes	Yes	-	Yes
6 Mitigation measures	Yes	Yes	Yes	Yes	Yes	-
Operation						
	1 Changes to landscape character	2 Changes to landscape designations	3 Changes to visual amenity	4 Landscape mitigation		
1 Changes to landscape character	-	Yes	Yes	Yes	Yes	
2 Changes to landscape designations	Yes	-	Yes	Yes	Yes	
3 Changes to visual amenity	Yes	Yes	-	Yes	Yes	
4 Landscape mitigation	Yes	Yes	Yes	-	-	

29.11 Summary

29.11.1 Construction

29.11.1.1 Landfall

180. The landfall construction works would be relatively small in scale and this explains the very localised extent of the effects, contained within an area of approximately 300m. The landscape character of the Bacton to Sea Palling Coastal Plains LCU as a whole, would not be significantly affected owing to the relatively small scale of the construction works, while the very localised landscape character around the landfall would be significantly affected, albeit only during the short term construction period. Walkers on the Norfolk Coastal Path would be significantly affected in the very localised section adjacent to the landfall, while walkers on the wider extent of the route would remain unaffected. Walkers on PRow RB22 would also be significantly affected owing to the close proximity of this route to the landfall. Residents in Happisburgh would not be significantly affected, with the exception of residents of the southern extent of Lighthouse Lane, which is the closest part of the settlement to the landfall. The construction works would last a maximum of 20 weeks, making the effects short term. Reinstatement of the majority of the agricultural land at the end of this period would make the effects largely reversible.

29.11.1.2 Onshore Cable Route

181. The onshore cable route construction works would also be relatively small in scale giving rise to very localised effects, many of which are associated with the more notable mobilisation areas. Owing to the cultivated nature of the land, the relatively small sections of hedgerows and very small number of trees to be removed, the effect of the onshore cable route construction on agricultural land, trees and hedgerows would be not significant with the exception of select instances where a small number of good condition hedgerows or trees would be removed.

182. Blickling Hall and Salle Park RPGs are located within the onshore study area. However, neither will be significantly affected by the project. There are no other designated sites within the onshore cable route study area. In terms of road-users, significant effects would occur within localised sections of the A47, A149, B1146, B1147, A1067, B1145 (west of Cawston), Heydon Road and Lime Kiln Road, and effects would not be significant on all other roads and railways. These effects would relate largely to the presence and activity associated with the mobilisation areas. Walkers on the recreational route of the Wensum Way would experience significant effects, albeit over a very localised extent adjacent to the trenchless crossing (e.g. HDD) compound near the River Wensum. Settlements along the length of the onshore cable route would not be significantly affected, largely owing to a combination of the scale of the construction works, their distance from the

settlements and the screening effect of intervening vegetation and built form. All effects would be up to 2 years in duration and reversible, with the agricultural land and hedgerows reinstated post construction. A longer term effect would occur where trees could not be replanted in the onshore cable route easement, although very few trees would be removed, and their loss would be offset to some extent by the replanting of hedgerows.

29.11.1.3 Onshore project substation and National Grid substation extension

183. The construction of the onshore project substation, National Grid substation extension and overhead line modification would not significantly affect the landscape elements of agricultural land and hedgerows. The landscape character of the area would not be significantly affected apart from in the localised areas of the Settled Tributary Farmland LCT – River Wissey Tributary Farmland LCU and Plateau Farmland LCT – Beeston Plateau LCU and Pickenham Plateau LCU, in which the onshore project substation or National Grid substation extension would be located or would have a close range influence. Advanced planting, as part of the embedded mitigation of the project, would be implemented during the construction phase
184. In respect of representative viewpoints, significant effects would be experienced by walkers on Lodge Lane to the immediate south of the site, and by road-users on a very localised section of Ivy Todd Road to the south-west and a section of the A47 to the north. These effects would all occur within approximately 1.2km of the onshore project substation, making them localised. The effects would be short term and reversible, although effects relating to the presence of the onshore project substation and National Grid substation extension would extend into the operational phase. There would be no significant effects on the views of residents at Ivy Todd and Necton.

29.11.2 Operation

29.11.2.1 Landfall and onshore project substation

185. There would be no significant effects in relation to the landfall and onshore cable route during the operational phase, as the majority of the infrastructure would be buried under ground and therefore would have no effect on landscape character or visual amenity. This forms a notable part of the project's embedded mitigation.

29.11.2.2 Onshore project substation and National Grid substation extension

186. The operational phase of the onshore project substation and National Grid substation extension would not significantly affect landscape character, apart from in the localised areas of the Settled Tributary Farmland LCT – River Wissey Tributary Farmland LCU and Plateau Farmland LCT – Beeston Plateau LCU and Pickenham

Plateau LCU in which the onshore project substation or National Grid substation extension would be located or would have a close range influence.

187. In respect of representative viewpoints, significant effects would be experienced by walkers on Lodge Lane to the immediate south of the site, and by road-users on a very localised section of Ivy Todd Road to the south-west and a section of the A47 to the north. These effects would all occur within approximately 1.2km of the onshore project substation, making them localised. There would be no significant effects on the views of residents at Ivy Todd and Necton.
188. Extensive landscape planting and earthworks would be implemented on the sites of the onshore project substation, National Grid substation extension and around the new A47 junction, in order to mitigate localised effects. Landscape planting would comprise mostly woodland planting that would grow to screen or partially screen the onshore components and associated infrastructure of the project.
189. Mitigation planting located around the onshore project substation, National Grid substation extension and A47 junction would mature sufficiently during the indicative design life of the project to mitigate significant effects. Of the post-construction effects, effects on road-users on the A47 would be mitigated within the first 10 years of operation and effects on walkers on Lodge Lane and on local landscape character would be mitigated within the first 20 years. While the effects on Viewpoint 1 Ivy Todd Road west would take 25 years of the indicative design life to mitigate, the limited extent to which this view is experienced by road-users, moderates this effect.

29.11.3 Cumulative

190. The onshore project substation for Norfolk Vanguard and the National Grid substation extension in conjunction with the onshore project substation and National Grid substation extension for Norfolk Boreas would have a not significant cumulative effect on landscape character, with the exception of the localised parts of the Settled Tributary Farmland LCT – River Wissey Tributary Farmland LCU and Plateau Farmland LCT – Beeston Plateau LCU and Pickenham Plateau LCU, in which the onshore project substations or National Grid substation extensions would be located or would have a close range influence. In respect of representative viewpoints, significant cumulative effects would arise in respect of the views of walkers on Lodge Lane to the immediate south of the site and road-users on a very localised section of Ivy Todd Road to the south-west. These effects would all occur within approximately 1.2km of the onshore project substation, making them localised.

191. The construction of the Norfolk Vanguard onshore cable route in addition to the Hornsea Project Three onshore cable route would have a short term significant cumulative effect on the views of walkers on an approximate 200m section of Marriott's Way, but would not have significant effects on the remaining parts of this route or on any other landscape or visual receptors, including nearby Salle Park and the B1145. This effect would be short term and reversible.
192. Mitigation planting located around the onshore project substation, National Grid substation extension and A47 junction would mature sufficiently during the indicative design life of the project to mitigate significant cumulative effects. Of the post-construction effects, cumulative effects on walkers on Lodge Lane and on local landscape character would be mitigated within the first 20 years. While the cumulative effects on Viewpoint 1 Ivy Todd Road west would take 25 years of the indicative design life to mitigate, the limited extent to which this view is experienced by road-users, moderates this effect.

29.11.4 Conclusions

193. Table 29.20 below summarises the significant effects that would potentially arise as a result of the project but does not present the 'not significant' effects. The assessment has shown that the significant effects would occur within localised extents of certain components of the project only. Both direct and indirect effects would occur as a result of the presence of components of the project and the influence of their visibility across specific parts of the study area.
194. The LVIA and CIA have demonstrated that despite the scale of the project, the significant effects would occur in relatively contained parts of each relevant study area, with the majority of landscape and visual receptors in each study area either undergoing not significant effects or no effect. Furthermore, not all landscape and visual receptors within the defined areas where significant effects would occur would necessarily be significantly affected as the visual influence of the project would be variable across these areas.
195. In respect of the landfall and onshore cable route, significant effects would occur only during the construction phase and not the operational phase, and these effects would be short term in relation to the construction works, and medium term in relation to the re-establishment of hedgerows. The only long term effects would occur in very localised areas where tree removal or the removal of good condition hedgerows or hedgetrees would be required to accommodate the onshore cable route. The vast majority of trees and hedgerows along the 60km route would remain unaffected owing to careful siting.

196. There would be no cumulative effects in relation to either the landfall or the onshore cable route, with the exception of a localised and short term significant cumulative effect arising in respect of walkers on a short section of the Marriott's Way walking route to the south-west of Salle Park, where Hornsea Project Three onshore cable route would have a cumulative influence.
197. In respect of the onshore project substation and National Grid substation extension, the extent of the significant effects and significant cumulative effects would be largely contained within the local landscape, partly owing to the extent of existing woodland cover to the north and east and rising landform to the south, and effects on visual amenity would be limited largely owing to the enclosure of hedgerows along roads and around settlements. Significant effects and significant cumulative effects would be contained within 1.2km of the onshore project substation and National Grid substation extension.
198. Of all the visual receptors which occur around the onshore project substation and National Grid substation extension, significant effects have been assessed in relation only to road-users on a short section of the A47, an opening on Ivy Todd Road and walkers on Lodge Lane. Post construction, embedded mitigation in the form of landscape planting would mitigate these localised effects within 10 years in respect of the views from the A47, 20 years in respect of the views from Lodge Lane and 25 years in respect of the opening on Ivy Todd Road west. In respect of local landscape character, effects would be gradually mitigated as planting grows during the indicative design life, with the assessment that by 20 years of operation, significant effects would be mitigated. Once mitigated, the effects would become beneficial as the mitigation planting would enhance the local visual amenity.

Table 29.20 Potential significant effects for landscape and visual receptors (does not include not significant effects)

Potential Impact	Receptor	Value/ Sensitivity	Magnitude	Significance	Mitigation	Residual Impact
Construction - Landfall						
Potential impact on landscape character relating to landfall construction.	Coastal Plain LCT – Bacton to Sea Palling.	Medium to high	Medium to high or medium between the ridge on which Happisburgh Lighthouse sits in the north and PRow Happisburgh RB22 in the south. Low or no effect across remainder of LCU.	Significant between the ridge on which Happisburgh Lighthouse sits in the north and PRow Happisburgh RB22 in the south. Not significant across remainder of LCU.	Land reinstated post construction.	None. Effect short term and reversible, relating to construction phase.
Potential impact on visual amenity of walkers relating to landfall construction.	Walkers on Norfolk Coastal Path	High	Medium to high or medium between Happisburgh coastal car park and PRow Happisburgh RB22. No effect across remainder of path.	Significant between Happisburgh coastal car park and PRow Happisburgh RB22. Not significant across remainder of path.	Land reinstated post construction.	None. Effect short term and reversible, relating to construction phase.
Potential impact on visual amenity of residents relating to landfall construction.	Residents in Happisburgh	Medium to high	Medium on Lighthouse Lane. Low or no effect across remaining parts.	Significant on Lighthouse Lane. Not significant across remaining parts of settlement.	Land reinstated post construction.	None. Effect short term and reversible, relating to construction phase.
Potential impact on visual amenity of walkers relating to landfall construction.	Walkers on PRow RB22	Medium to high	Medium to high along length of PRow.	Significant along length of PRow.	Land reinstated post construction.	None. Effect short term and reversible, relating to construction phase.
Construction - Onshore Cable Route						

Potential Impact	Receptor	Value/ Sensitivity	Magnitude	Significance	Mitigation	Residual Impact
Potential impact on landscape element of hedgerows and hedgetrees relating to onshore cable route construction.	Hedgerows and hedgetrees	Medium	Medium to high or medium in respect of mature good quality hedgerows and hedgetrees. Medium to low in respect of poorer quality hedgerows.	Significant where mature good quality hedgerows and hedgetrees are removed. Not significant for all remaining hedgerows.	Land reinstated post construction. Hedgerows replanted post construction – 3-5 years to infill gaps. Hedgetrees could not be replanted over cable easements.	None. Effect short term and reversible in respect of hedgerows and most hedgetrees. Significant where good quality hedgetrees are removed. Long term and reversible effect.
Potential impact on landscape element of trees relating to onshore cable route construction.	Trees	Medium to high	Medium to high or medium in respect of specific good quality trees. Medium to low in respect of poorer quality or isolated trees.	Significant where specific good quality trees are removed. Not significant for all remaining trees.	Land reinstated post construction. Hedgerows replanted post construction – 3-5 years to infill gaps. (Trees could not be replanted over cable easements.)	Significant where good quality trees are removed and cannot be replaced. Long term and reversible effect.
Potential impact on visual amenity of road-users relating to presence of mobilisation area.	Road-users on Dereham Road (west of Scarning)	Medium	Medium over approximate 120m section. Low or no effect across remaining parts.	Significant over approximate 120m section. Not significant for remaining parts.	Land reinstated post construction.	None. Effect short term and reversible.
Potential impact on visual amenity of road-users relating to trenchless crossing (e.g. HDD)	Road-users on A47 (south-west of Dereham)	Medium	Medium over approximate 150m section. Low or no effect across remaining parts.	Significant over approximate 150m section. Not significant for remaining parts.	Land reinstated post construction.	None. Effect short term and reversible.

Potential Impact	Receptor	Value/ Sensitivity	Magnitude	Significance	Mitigation	Residual Impact
compounds.						
Potential impact on visual amenity of road-users relating to mobilisation area.	Road-users on B1146 (north of Dereham)	Medium	Medium to high over approximate 800m section. Low or no effect across remaining parts.	Significant over approximate 800m section. Not significant for remaining parts.	Land reinstated post construction. Hedgerows replanted post construction – 5 -10 years to infill gaps.	None. Effect short term and reversible.
Potential impact on visual amenity of road-users relating to mobilisation area.	Road-users on B1147 (south of Swanton Morley)	Medium	Medium to high over approximate 200m section. Low or no effect across remaining parts.	Significant over approximate 200m section. Not significant for remaining parts.	Land reinstated post construction. Hedgerows replanted post construction – 5 -10 years to infill gaps.	None. Effect short term and reversible.
Potential impact on visual amenity of road-users relating to mobilisation area and onshore cable route construction.	Road-users on Lime Kiln Road	Medium	Medium over approximate 1.2km and 200m section. Low or no effect across remaining parts.	Significant over approximate 1.2km and 200m section. Not significant for remaining parts.	Land reinstated post construction. Hedgerows replanted post construction – 3-5 years to infill gaps.	None. Effect short term and reversible.
Potential impact on visual amenity of road-users relating to mobilisation area.	Road-users on A1067 (west of Sparham)	Medium	Medium over approximate 300m section. Low or no effect across remaining parts.	Significant over approximate 300m section. Not significant for remaining parts.	Land reinstated post construction. Hedgerows replanted post construction – 3-5 years to infill gaps.	None. Effect short term and reversible.
Potential impact on visual amenity of road-users relating to onshore cable route construction.	Road-users on B1145 (west of Cawston)	Medium	Medium over approximate 70m section. Low or no effect across remaining parts.	Significant over approximate 70m section. Not significant for remaining parts.	Land reinstated post construction. Hedgerows replanted post construction – 3-5 years to infill gaps.	None. Effect short term and reversible.

Potential Impact	Receptor	Value/ Sensitivity	Magnitude	Significance	Mitigation	Residual Impact
Potential impact on visual amenity of road-users relating to mobilisation area.	Road-users on Heydon Road	Medium	Medium over approximate 150m section. Low or no effect across remaining parts.	Significant over approximate 150m section. Not significant for remaining parts.	Land reinstated post construction.	None. Effect short term and reversible.
Potential impact on visual amenity of road-users relating to mobilisation area.	Road-users on A149	Medium	Medium over approximate 400m section. Low or no effect across remaining parts.	Significant over approximate 400m section. Not significant for remaining parts.	Land reinstated post construction.	None. Effect short term and reversible.
Potential impact on visual amenity of road-users relating to onshore cable route construction.	Walkers on Wensum Way	Medium to high	Medium to high over approximate 550m section next to mobilisation area and 80m section at crossing point. Low or no effect across remaining parts.	Significant over approximate 550m section and 80m section. Not significant for remaining parts.	Land reinstated post construction. Hedgerows replanted post construction – 5-10 years to infill gaps. Trees could not be replanted over cable easements.	None. Effect short term and reversible.
Construction – Onshore Project Substation and National Grid substation extension						
Potential impact on landscape element of hedgerows relating to project construction.	Hedgerows	Medium to high	Medium to low	Not significant	Advanced planting implemented during construction phase. Hedgerows replanted post construction – 3-5 years to infill gaps.	None. Effect medium term and reversible.
Potential impact on landscape character relating to project construction.	Plateau Farmland LCT: Pickenham Plateau LCU	Medium	High or medium within local area of spur. Low or no effect across remainder of LCU.	Significant in local area of spur. Not significant across remainder of LCU.	Advanced planting implemented during construction phase. Hedgerows replanted post construction – 3-5	None. Effect medium term and reversible.

Potential Impact	Receptor	Value/ Sensitivity	Magnitude	Significance	Mitigation	Residual Impact
					years to infill gaps.	
Potential impact on landscape character relating to project construction.	Settled Tributary Farmland LCT: River Wissey LCU	Medium	High or medium in the area defined by the A47 to the north, Great Wood and Smuggler's Lane to the east, Necton National Grid Substation and the Necton ridgeline to the west and Ivy Todd Road to the south. Low or no effect across remainder of LCU.	Significant in the area defined by the A47 to the north, Great Wood and Smuggler's Lane to the east, Necton National Grid Substation and the Necton ridgeline to the west and Ivy Todd Road to the south. Not significant across remainder of LCU.	Advanced planting implemented during construction phase. Hedgerows replanted post construction – 3-5 years to infill gaps.	None. Effect medium term and reversible.
Potential impact on landscape character relating to project construction.	Plateau Farmland LCT: Beeston Plateau	Medium	High or medium in the area extending to the A47 to the north, Great Wood and Smuggler's Lane to the east, and the LCU boundary to the west and south. Low or no effect across remainder of LCU.	Significant in the area extending to the A47 to the north, Great Wood and Smuggler's Lane to the east, and the LCU boundary to the west and south. Not significant across remainder of LCU.	Advanced planting implemented during construction phase. Hedgerows replanted post construction – 3-5 years to infill gaps.	None. Effect medium term and reversible.
Potential impact on visual amenity of road-users relating to project construction.	VP1 Ivy Todd Road (west)	Medium	Medium to high over approximate 10m section. Low or no effect across wider extent of road.	Significant over approximate 10m section. Not significant across wider extent of road.	Advanced planting implemented during construction phase. Hedgerows replanted post construction – 3-5 years to infill gaps.	None. Effect medium term and reversible.
Potential impact on visual amenity of walkers relating to project construction.	VP2 Lodge Lane (south)	Medium	High over approximate 550m southern section of lane.	Significant over approximate 550m southern section of lane.	Advanced planting implemented during construction phase. Hedgerows replanted	None. Effect medium term and reversible.

Potential Impact	Receptor	Value/ Sensitivity	Magnitude	Significance	Mitigation	Residual Impact
					post construction – 3-5 years to infill gaps.	
Potential impact on visual amenity of walkers relating to project construction.	VP3 Lodge Lane (north)	Medium	Medium over approximate 250m northern section of lane.	Significant over approximate 250m northern section of lane.	Advanced planting implemented during construction phase. Hedgerows replanted post construction – 3-5 years to infill gaps.	None. Effect medium term and reversible.
Potential impact on visual amenity of A47 road-users relating to project construction.	VP4 A47 Necton Substation	Medium	Medium over approximate 250m section of A47. Low or no effect across other adjacent sections.	Significant over approximate 250m section of A47. Not significant across remainder of A47.	Existing mitigation planting associated with Dudgeon Substation located to south of A47.	None. Effect medium term and reversible over approximate 300m section.
Potential impact on visual amenity of A47 road-users relating to project construction.	VP5 A47 Spicer's Corner	Medium	Medium to high over approximate 300m section of A47. Low or no effect across other adjacent sections.	Significant over approximate 300m section of A47. Not significant across remainder of A47.	Trees replanted post construction – 10 years to infill gaps. Existing mitigation planting associated with Dudgeon Substation located to south of A47.	None after 10 years. Significant effect long term (10 years) and reversible over approximate 300m section.
Operation – Onshore Project Substation and National Grid substation extension						
Potential impact on landscape character relating to project operation.	Plateau Farmland LCT: Pickenham Plateau LCU	Medium	High or medium within local area of spur. Low or no effect across remainder of LCU.	Significant in local area of spur. Not significant across remainder of LCU.	Mitigation planting would gradually reduce effect to not significant over first 20 years of indicative design life.	None after 20 years. Significant effect long term (20 years) and reversible in localised area.
Potential impact on	Settled	Medium	High or medium in the area	Significant in the area defined	Mitigation planting	None after 20

Potential Impact	Receptor	Value/ Sensitivity	Magnitude	Significance	Mitigation	Residual Impact
landscape character relating to project operation.	Tributary Farmland LCT: River Wissey LCU		defined by the A47 to the north, Great Wood and Smuggler's Lane to the east, Necton National Grid Substation and the Necton ridgeline to the west and Ivy Todd Road to the south. Low or no effect across remainder of LCU.	by the A47 to the north, Great Wood and Smuggler's Lane to the east, Necton National Grid Substation and the Necton ridgeline to the west and Ivy Todd Road to the south. Not significant across remainder of LCU.	would gradually reduce effect to not significant over first 20 years of indicative design life.	years. Significant effect long term (20 years) and reversible in localised area.
Potential impact on landscape character relating to project operation.	Plateau Farmland LCT: Beeston Plateau	Medium	High or medium in the area extending to the A47 to the north, Great Wood and Smuggler's Lane to the east, and the LCU boundary to the west and south. Low or no effect across remainder of LCU.	Significant in the area extending to the A47 to the north, Great Wood and Smuggler's Lane to the east, and the LCU boundary to the west and south. Not significant across remainder of LCU.	Mitigation planting would gradually reduce effect to not significant over first 20 years of indicative design life.	None after 20 years. Significant effect long term (20 years) and reversible in localised area.
Potential impact on visual amenity of road-users relating to project operation.	VP1 Ivy Todd Road (west)	Medium	High over an approximate 10m section of the road. Low or no effect over wider extent of road.	Significant over an approximate 10m section of the road. Not significant across wider extent of road.	Mitigation planting would gradually reduce effect to not significant during the first 25 years of indicative design life.	None after 25 years. Significant effect long term (25 years) and reversible over 10m section.
Potential impact on visual amenity of walkers relating to project operation.	VP2 Lodge Lane (south)	Medium	High along approximate 550m southern section. Low or no effect over remaining parts of lane.	Significant along approximate 550m southern section.	Mitigation planting would gradually reduce effect to not significant over first 20 years of indicative design life.	None after 20 years. Significant effect long term (20 years) and reversible over 550m section. Beneficial effect for

Potential Impact	Receptor	Value/ Sensitivity	Magnitude	Significance	Mitigation	Residual Impact
						remaining 10 years.
Potential impact on visual amenity of walkers relating to project operation.	VP3 Lodge Lane (south)	Medium	Medium along approximate 250m southern section. Low or no effect over remaining parts of lane.	Significant along approximate 250m southern section.	Mitigation planting would gradually reduce effect to not significant after 20 years.	None after 20 years. Significant effect long term (20 years) and reversible over 250m section. Beneficial effect for remaining 10 years.
Potential impact on visual amenity of A47 road-users relating to project operation.	VP5 A47 Spicer's Corner	Medium	Medium to high over approximate 50m section of A47 reducing to low as mitigation planting matures. Low or no effect across other adjacent sections.	Significant over approximate 50m section of A47 reducing to not significant as mitigation planting matures. Not significant across adjacent sections.	Mitigation planting would gradually reduce effect to not significant after 10 years Existing mitigation planting associated with Dudgeon Substation located to south of A47.	None after 10 years. Significant effect long term (10 years) and reversible over 50m section. Beneficial effect for remaining 20 years.
Decommissioning						
The detail and scope of the decommissioning works will be determined by the relevant legislation and guidance at the time of decommissioning and agreed with the regulator. A decommissioning plan will be provided. As such, impacts during the decommissioning stage are assumed to be no worse than those identified during the construction stage.						
Cumulative - Onshore Cable Route Construction						
Potential cumulative impact on visual amenity of walkers relating to Norfolk Vanguard and Norfolk Boreas projects.	Marriott's Way	Medium to high	Medium to low along approximate 200m southern section of lane. Low or no effect along remaining northern extent of lane.	Significant along an approximate 200m section of path. Not significant along remaining northern extent of path.	Land reinstated post construction. Hedgerows replanted post construction – 3-5 years to infill gaps.	None. Effect short term and reversible.

Potential Impact	Receptor	Value/ Sensitivity	Magnitude	Significance	Mitigation	Residual Impact
Cumulative - Onshore Project Substation Operation						
Potential cumulative impact on landscape character relating to Norfolk Vanguard and Norfolk Boreas projects.	Plateau Farmland LCT: Pickenham Plateau LCU	Medium	Medium to high within local area of spur. Low or no effect across remainder of LCU.	Significant in local area of spur. Not significant across remainder of LCU.	Mitigation planting would gradually reduce effect to not significant over first 20 years of indicative design life.	None after 20 years. Significant effect long term (20 years) and reversible in localised area.
Potential cumulative impact on landscape character relating to Norfolk Vanguard and Norfolk Boreas projects.	Settled Tributary Farmland LCT: River Wissey LCU	Medium	Medium to high or medium in the area defined by the A47 to the north, Great Wood and Smuggler's Lane to the east, Necton National Grid Substation and the Necton ridgeline to the west and Ivy Todd Road to the south. Low or no effect across remainder of LCU.	Significant in the area defined by the A47 to the north, Great Wood and Smuggler's Lane to the east, Necton National Grid Substation and the Necton ridgeline to the west and Ivy Todd Road to the south. Not significant across remainder of LCU.	Mitigation planting would gradually reduce effect to not significant over first 20 years of indicative design life.	None after 20 years. Significant effect long term (20 years) and reversible in localised area.
Potential cumulative impact on landscape character relating to Norfolk Vanguard and Norfolk Boreas projects.	Plateau Farmland LCT: Beeston Plateau	Medium	Medium to high or medium in the area extending to the A47 to the north, Great Wood and Smuggler's Lane to the east, and the LCU boundary to the west and south. Low or no effect across remainder of LCU.	Significant in the area extending to the A47 to the north, Great Wood and Smuggler's Lane to the east, and the LCU boundary to the west and south. Not significant across remainder of LCU.	Mitigation planting would gradually reduce effect to not significant over first 20 years of indicative design life.	None after 20 years. Significant effect long term (20 years) and reversible in localised area.
Potential cumulative impact on visual amenity of road-users relating to Norfolk	VP1 Ivy Todd Road (west)	Medium	Medium over an approximate 10m section of the road. Low or no effect across wider	Significant over an approximate 10m section of the road. Not significant across wider	Mitigation planting would gradually reduce effect to not significant over the first 25 years of	None after 25 years. Significant effect long term (25 years) and

Potential Impact	Receptor	Value/ Sensitivity	Magnitude	Significance	Mitigation	Residual Impact
Vanguard and Norfolk Boreas projects.			extent of road.	extent of road.	indicative design life.	reversible over 10m section.
Potential cumulative impact on visual amenity of walkers relating to Norfolk Vanguard and Norfolk Boreas projects.	VP2 Lodge Lane (south)	Medium	Medium to high along approximate 550m southern section of lane. Low or no effect along remaining northern extent of lane.	Significant along an approximate 550m southern section of lane. Not significant along remaining northern extent of lane.	Mitigation planting would gradually reduce effect to not significant after 20 years of indicative design life.	None after 20 years. Significant effect long term (20 years) and reversible over 550m section. Beneficial effect for remaining 10 years.
Cumulative - Decommissioning						
The detail and scope of the decommissioning works will be determined by the relevant legislation and guidance at the time of decommissioning and agreed with the regulator. A decommissioning plan will be provided. As such, cumulative impacts during the decommissioning stage are assumed to be no worse than those identified during the construction stage.						

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