Norfolk Vanguard Offshore Wind Farm

Chapter 30

Tourism and Recreation

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

AONB	Area of Outstanding Natural Beauty
AMP	Access Management Plan
B&B	Bed and Breakfast
BAT	Best Available Technique
BC	Breckland Council
BW	Bridleway
BPM	Best Practical Means
BDC	Broadland District Council
BSAC	British Sub Aqua Club
CoCP	Code of Construction Practice
CLC	Construction Liaison Committee
CRoW	Countryside and Rights of Way
CRS	Cable Relay Station
dB	Decibels
DCO	Development Consent Order
DECC	Department of Energy and Climate Change
DPD	Development Plan Documents
DTI	Department of Trade and Industry
EEA	European Economic Area
EIA	Environmental Impact Assessment
EN-1	Overarching National Policy Statement for Energy
ES	Environmental Statement
ETG	Expert Topic Group
FP	Foot Path
HAT	Height Above Tide
HDD	Horizontal Directional Drilling
HHPC	Holme Hale Parish Council
HVDC	High Voltage Direct Current
LCT	Landscape Character Types
LCU	Landscape Character Units
LEP	Local Enterprise Partnership
MCA	Maritime and Coastguard Agency
MW	Megawatt
NGET	National Grid Electricity Transmission
NLW	National Living Wage
NNDC	North Norfolk District Council
NPPF	National Planning Policy Framework
NPS	National Policy Statement
NSIP	Nationally Significant Infrastructure Projects
OCoCP	Outline Code of Construction Practice
OESEA3	UK Offshore Energy Strategic Environmental Assessment 3
OLEMS	Outline Landscape and Environmental Management Strategy
O&M	Operations and Maintenance
OWF	Offshore Wind Farms
PEIR	Preliminary Environmental Information Report

PPG	Planning Policy Guidance Notes
PPS	Planning Policy Statement
PRoW	Public Right of Way
RNLI	Royal National Lifeboat Institution
RYA	Royal Yacht Association
SAC	Special Area of Conservation
SoS	Secretary of State
SPA	Special Protection Area
SPD	Supplementary Planning Document
SSSI	Site of Special Scientific Interest
TMP	Traffic Management Plan
WFD	Water Framework Directive

Terminology

Array cables	Cables which link the wind turbines and the offshore electrical platform.
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.
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 new / replacement overhead line tower	New overhead line towers to be installed at the National Grid substation.
National Grid overhead line modifications	The works to 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
National Grid temporary works area	Land adjacent to the Necton National Grid substation which would be temporarily required during construction 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
Offshore cable corridor	The corridor of seabed from the Norfolk Vanguard OWF sites to the landfall site within which the offshore export cables will be located.
Offshore export cables	The cables which bring electricity from the offshore substation platform to the landfall.
Onshore 400kV cable route	Buried high-voltage cables linking the onshore project substation to the Necton National Grid substation
Onshore cable corridor	200m wide onshore corridor within which the onshore cable route would be located as submitted for PEIR.

Onshore cables	The cables which take the electricity from landfall to the onshore 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. In an HVDC system 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.
Rochdale Envelope	The Rochdale Envelope is an approach to consenting and environmental impact, named after a UK planning law case, which allows a project description to be broadly defined, within a number of agreed parameters, for the purposes of a consent application.
Running track	The track along the onshore cable route which the construction traffic would use to access workfronts.
Safety zones	A marine zone outlined for the purposes of safety around a possibly hazardous installation or works / construction area under the Energy Act 2004.
The Applicant	Norfolk Vanguard Limited
The OWF sites	The two distinct offshore wind farm areas, Norfolk Vanguard East and Norfolk Vanguard West.
The project	Norfolk Vanguard Offshore Wind Farm, including the onshore and offshore infrastructure.
Trenchless crossing zone (e.g. HDD)	Temporary areas required for trenchless crossing works.

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30 TOURISM AND RECREATION

30.1 Introduction

1. This chapter of the Environmental Statement (ES) considers the potential impacts of the proposed Norfolk Vanguard Offshore Wind Farm (hereafter 'the project') on tourism and recreation. The chapter provides an overview of the existing tourism and recreational assets where the onshore project area is proposed, followed by an assessment of the potential impacts and associated mitigation for the construction, operation and decommissioning of the project.

2. The assessment also considers cumulative impacts of the project with other proposed projects. The proposed methodology adhered to for the Environmental Impact Assessment (EIA) and Cumulative Impact Assessment (CIA) is discussed in section 30.4.

3. Figures which accompany the text in this chapter are provided in Volume 2 Figures.

4. The tourism industry is dependent upon tourists choosing to visit a region. Visitors' choices can be influenced by changes in the landscape, physical disturbances such as noise or vibration, obstructions to the access routes and areas they use for recreation, and the availability of accommodation. As the offshore elements of the project are beyond the visual range of people at the coast, only the onshore and nearshore aspects of the project will be considered within this chapter.

5. Because of the close association between tourism, fisheries, land use, traffic, noise, health, landscape and socio-economic topics, 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 14 Commercial Fisheries;
   - Chapter 15 Shipping and Navigation;
   - Chapter 21 Land Use and Agriculture;
   - Chapter 24 Traffic and Transport;
   - Chapter 25 Noise and Vibration;
   - Chapter 27 Human Health;
   - Chapter 29 Landscape and Visual Impact Assessment;
   - Chapter 31 Socio-Economics; and
   - The Outline Code of Construction Practice (OCoCP) (document reference 8.1).

30.2 Legislation, Guidance and Policy

6. There are a number of pieces of legislation, policy and guidance applicable to land use and agriculture. The following sections provide detail on key pieces of

international and UK legislation, policy and guidance which are relevant to this chapter.

30.2.1 National Planning Policy

7. The assessment of potential impacts upon recreational assets and socio-economics has been made with specific reference to the relevant National Policy Statements (NPS). These are the principal decision-making documents for Nationally Significant Infrastructure Projects (NSIPs). Those relevant to the project are:

- Overarching NPS for Energy (EN-1) (Department of Energy and Climate Change (DECC) 2011a);
- NPS for Renewable Energy Infrastructure (EN-3) (DECC 2011b); and
- NPS for Electricity Networks Infrastructure (EN-5) (DECC 2011c).

8. The Overarching NPS for Energy (EN-1) (Department of Energy and Climate Change (DECC), 2011a) is the only NPS relevant to the tourism and recreational aspects of the project[1]. Further detail on legislation and policy in relation to the wider project is provided in Chapter 3 Policy and Legislative Context.

9. The tourist economy is a subset of the wider socio-economy that gains financial benefit from recreational assets due to expenditure of visitors. Therefore, reference to impacts on recreation and socio-economics implies impacts to the tourist economy.

10. The specific requirements of the NPS in relation to tourism and recreation are summarised in

11. Table 30.1, together with an indication of the section or paragraph number of this chapter where each is addressed. Where any part of the NPS has not been followed within the assessment an explanation as to why the requirement was not deemed relevant, or has been met in another manner, is provided.

Table 30.1 NPS assessment requirements

NPS Requirement	NPS Reference	ES Reference
The ES (see section 4.2) should include an assessment of the effects on the coast. In particular, applicants should assess the effects of the proposed project on maintaining coastal recreation sites and features.	EN-1 section 5.5.7	One of the objectives of the site selection process was to avoid valuable natural assets such as the North Norfolk Coast Area of Outstanding Natural Beauty (AONB) and the Broads National Park. This allowed it to avoid corresponding clusters of tourism and recreation assets. In response to consultation with stakeholders a horizontal drilling design has been developed that will not require closure of either the coastal footpaths or the beach.

[1] The NPS for Renewable Energy Infrastructure (EN-3) and NPS for Electricity Networks Infrastructure (EN-5) do not specifically include details on the assessment of impacts on tourism and recreation.

NPS Requirement	NPS Reference	ES Reference
		An assessment of impact on coastal processes, marine water, and water resources is undertaken in: • Chapter 8 Marine geology, oceanography and physical processes • Chapter 9 Marine water and sediment quality; and • Chapter 20 Water Resources and Flood Risk, respectively.
Applicants will need to consult the local community on their proposals to build on open space, sports or recreational buildings and land. Taking account of the consultations, applicants should consider providing new or additional open space including green infrastructure, sport or recreation facilities, to substitute for any losses as a result of their proposal. Applicants should use any up-to-date local authority assessment or, if there is none, provide an independent assessment to show whether the existing open space, sports and recreational buildings and land is surplus to requirements.	EN-1 paragraph 5.10.6	As part of the consultation process the project has consulted with non-statutory stakeholders, local communities, and the public. Their responses have been instrumental in the development of the project and embedded mitigation. This is detailed in Chapter 4 Site Selection and Assessment of Alternatives, the Consultation Report and is detailed with regards Tourism and Recreation in section 30.3. The project will not build permanent above ground infrastructure on publicly accessible open space, sports or recreational buildings and land.
This assessment should consider all relevant socio-economic impacts, which may include: the provision of additional local services and improvements to local infrastructure, including the provision of educational and visitor facilities; and effects on tourism.	EN-1 section 5.12.3	This chapter considers impacts to tourism and recreation receptors. Chapter 31 Socio-Economics discusses impacts to socio-economic receptors. Both short and long-term obstructions are considered in section 30.8 and Chapter 31 Socio-Economics. The use of below ground infrastructure and situating wind turbines 47km offshore limits opportunities for potential benefit to tourism suppliers. However, due to the proposed siting of the Norfolk Vanguard landfall at Happisburgh South, an area recognised as an internationally important region for Lower Palaeolithic archaeology, the project has undertaken an engagement process with a specific independent academic steering group in relation to the Ancient Humans of Britain project. This engagement process aims, in part, to maximise knowledge gained from pre-construction and construction activities. Opportunities for public engagement on the

NPS Requirement	NPS Reference	ES Reference
		basis of any data obtained are currently under consideration, with approaches similar to the Jurassic Coast and Deep History Coast projects being explored. It is hoped that this knowledge will be used by appropriate stakeholders and this engagement is discussed further in Chapter 28 Onshore Archaeology and Cultural Heritage.

12. In section 4.1.5 of the NPS EN-1, it is stated that:

"The energy NPSs have taken account of relevant Planning Policy Statements (PPSs) and older style Planning Policy Guidance Notes (PPGs) in England where appropriate".

30.2.1.1 National Planning Policy Framework (NPPF)

13. The NPPF, published in 2012 replaces the former series of Planning Policy Statements. From its outset the document makes plain that it is concerned with Sustainable Development, and paragraph 6 states that there are three dimensions to sustainable development: economic, social and environmental, and that all three are mutually dependent and gains for all should be sought jointly and simultaneously through the planning system. Paragraph 28 discusses supporting a prosperous rural economy, including for supporting sustainable rural tourism. Paragraph 79 discusses protection of public rights of way and access.

14. The environmental dimension is defined (as per the framework document) below:

"an environmental role – contributing to protecting and enhancing our natural, built and historic environment; and, as part of this, helping to improve biodiversity, use natural resources prudently, minimise waste and pollution, and mitigate and adapt to climate change including moving to a low carbon economy".

30.2.2 Local Planning Policy

15. EN-1 states that the Planning Inspectorate will also consider Development Plan Documents (DPD) or other documents in the Local Development Framework to be relevant to its decision making.

16. The onshore project area falls under the jurisdiction of Norfolk County Council and the following local planning authorities:

- Broadland District Council;
- North Norfolk District Council; and
- Breckland Council.

17. Local planning policy documents relevant to tourism and recreation include:

- Broadland, Norwich and South Norfolk Joint Core Strategy (2014);
- Broadland District Council (BDC) Development Management Development Plan;
- North Norfolk District Council (NNDC) Core Strategy; and
- Breckland Council (BC) Emerging Local Plan.

18. The relevant existing DPD documents are summarised in Table 30.2.

Table 30.2 Relevant local planning policies

Document	Policy/guidance	Policy/guidance purpose	ES reference
Broadland, Norwich and S Norfolk			
Broadland, Norwich and South Norfolk Joint Core Strategy (2014)	Policy 5	Tourism, leisure, environmental and cultural industries will be promoted.	Impacts to tourism and leisure activities are considered in section 30.8.
	Policy 6	Significant improvement to the bus, cycling and walking network, including Bus Rapid Transit on key routes in the Norwich area; and Concentration of development close to essential services and facilities to encourage walking and cycling as the primary means of travel with public transport for wider access.	Impacts to cycling and walking paths and networks are considered in section 30.8. Impacts on traffic are also considered in Chapter 24 Traffic and Transport.
	Policy 8	The cultural offer is an important and valued part of the area. Existing cultural assets and leisure facilities will be maintained and enhanced.	Impacts to leisure facilities and assets are considered in section 30.8..
	Policy 18	In areas in close proximity to the Broads Authority area particular regard will be applied to maintaining and enhancing the economy, environment, tranquillity, setting, visual amenity, recreational value and navigational use of the Broads. Opportunities will be taken to make better use of the benefits of the Broads, and to support its protection and enhancement while ensuring no detrimental impact on the Broadland SPA, Broadland Ramsar and Broads SAC.	Impacts to the Broads are considered in section 30.8, Chapter 20 Water Resources and Flood Risk and Chapter 22 Onshore Ecology.
Broadland District Council			
Broadland District Development Management Development Plan (adopted	Section 2.28	It is important to ensure sufficient protection for the particularly distinctive and sensitive biodiversity and landscape areas. The impact of renewable energy projects upon such areas should therefore be considered carefully taking account of the	Impacts relevant to landscape and biodiversity and effects on tourism and recreation are discussed in section 30.8.. Impacts to biodiversity are further discussed in Chapter 22

Document	Policy/guidance	Policy/guidance purpose	ES reference
August 2015)		Landscape Character Assessment SPD and biodiversity information.	Onshore Ecology and landscape further discussed in Chapter 29 Landscape and Visual Impact Assessment
	Section 5.7	The Council is committed to improving the quality and range of tourist attractions and accommodation throughout the district and this is identified as a priority within the Council's strategy on economic development.	Impacts to accommodation and tourist attractions are considered in section 30.8.
North Norfolk District Council			
North Norfolk Core Strategy (2008) to 2021	Policy SS1	The North Norfolk countryside is a principal element in the rural character of North Norfolk and is enjoyed by residents and visitors. The quality and character of this area should be protected and where possible enhanced, whilst enabling those who earn a living from, and maintain and manage, the countryside to continue to do so. Therefore, while some development is restricted in the Countryside, particular other uses will be permitted in order to support the rural economy, meet local housing needs and provide for particular uses such as renewable energy and community uses.	Impacts to recreational use of the area are considered in section 30.8. Impacts to landscape are discussed in chapter 29 Landscape and Visual Assessment.
	Policy SS2	In areas designated as Countryside development will be limited to that which requires a rural location and is for…renewable energy projects.	Impacts to recreational use of the area are considered in section 30.8. Impacts to landscape are discussed in Chapter 29 Landscape and Visual Impact Assessment.
		Regional policy requires that local authorities seek to provide networks of accessible greenspace linking urban areas to the countryside and to set targets for the provision of green space in new development. Therefore, Core Strategy policies: • Protect existing open space and areas designated for environmental purposes; • Require that new development includes open space to meet locally defined targets (see	Impacts to cycling and walking paths and networks are considered in section 30.8. Impacts to biodiversity are discussed in Chapter 22 Onshore Ecology.

Document	Policy/guidance	Policy/guidance purpose	ES reference
		• Appendix A: 'Open Space Standards') • Requires that development makes links to the surrounding countryside; and • Seeks to create an ecological network.	
	Policy SS4	Renewable energy proposals will be supported where impacts on amenity, wildlife and landscape are acceptable.	Impacts on recreational use of the area are considered in section 30.8. Impacts on biodiversity are discussed in Chapter 22 Onshore Ecology. Impacts on landscape are discussed in Chapter 29 Landscape and Visual Impact Assessment.
	Policy SS4	Open spaces and areas of biodiversity interest will be protected from harm, and the restoration, enhancement, expansion and linking of these areas to create green networks will be encouraged through a variety of measures such as: • Maximising opportunities for creation of new green infrastructure and networks in sites allocated for development; • Creating green networks to link urban areas to the countryside; • The designation of Local Nature Reserves and County Wildlife Sites; • Appropriate management of valuable areas, such as County Wildlife Sites; • Minimising the fragmentation of habitats, creation of new habitats and connection of existing areas to create an ecological network as identified in the North Norfolk ecological network report; • Progress towards Biodiversity Action Plan targets; and • Conservation and enhancement of Sites of Special Scientific Interest (SSSI) in accordance with the Wildlife and Countryside Act.	Impacts to wildlife appreciation and recreational use of wildlife areas are discussed in section 30.8. Impacts to biodiversity are considered in Chapter 22 Onshore Ecology.
	Section 3.1: Policy SS4:	North Norfolk has a distinctive architectural heritage and attractive rural landscapes and the Council wishes to ensure that development proposals conserve and enhance these features wherever possible.	Impacts on tourism, leisure and recreation are discussed in section 30.8. Impacts on architectural heritage are discussed in Chapter 28 Onshore Archaeology and Cultural Heritage. Impacts on

Document	Policy/guidance	Policy/guidance purpose	ES reference
			landscape are discussed in Chapter 29 Landscape and Visual Impact Assessment.
Breckland Council			
Breckland Adopted Core Strategy and Development Control Policies Development Plan Document	Section 2.3 Spatial Vision	Along the A11 corridor significant employment growth will have been achieved in advanced engineering, motor sport, research and development and logistics, building on the emerging employment base and taking advantage of the excellent highway network and linkages to other centres of business. In the rest of Breckland, employment will meet local needs with the important cultural, heritage, landscape and natural assets forming the basis for tourism, leisure and recreation.	Impacts on tourism, leisure and recreation are discussed in section 30.8
	Section 3.2.1 Natural Environment - Regional and Local Sites: Policy CP10	A full environmental appraisal will be required for development that may have a direct or indirect impact upon any site of regional or local biodiversity, or geological interest identified…. when considering exceptional circumstances, regard will be had to: • The regional and local importance of the site in terms of its contribution to biodiversity, scientific and educational interest, geodiversity, visual amenity and recreational value. The benefit that will be provided by the development in relation to the public interest.	Opportunities for public engagement with the Ancient Humans of Britain Project are discussed in Chapter 28 Onshore Archaeology and Cultural Heritage.
	Section 3.2.2 Protection and Enhancement of the Landscape: Policy CP11	The landscape of the District will be protected for the sake of its own intrinsic beauty and its benefit to the rural character and in the interests of biodiversity, geodiversity and historic conservation. Justification 3.86: The attractiveness of the District's landscape and the large areas which are already accessible to the public place recreational and visitor demands on the countryside. A number of strategies seek to promote tourism and healthy lifestyles, utilising the opportunities which a rural district like Breckland offers. In the Breckland SPA area of the District there is a need to ensure sustainable levels of recreation in the countryside to prevent	Impacts to tourism assets are discussed in section 30.7.5.4 Impacts relating to landscape are further discussed in Chapter 29 Landscape and Visual Impact Assessment.

Document	Policy/guidance	Policy/guidance purpose	ES reference
		recreational pressure having an adverse impact on Annex 1 bird species. Breckland Council is committed through this Core Strategy, its other Development Plan Documents and wider corporate activities to manage sustainable access in those parts of the District.	
	Section 3.4.1 Accessibility: Policy CP 13	New growth in Breckland will be delivered to promote accessibility improvements……. The development of schools and other training facilities will need to be developed in conjunction with education and training services to accommodate the needs of the growing populations…… In addition to education facilities, health, community, sports and recreation facilities (including public open space) will also need to be provided to meet the needs of the growing population.	Impacts to PRoWs, cycle tracks, footpaths and non-motorised routes are considered in section 30.7.5.8.
	Section 4.3.1 Open Space: Policy DC11	Development that would result in the loss of existing sport, recreational or amenity open space will only be permitted if: • It can be demonstrated (through a local assessment) that there is an excess of recreational or amenity open space in the settlement and the proposed loss will not result in a current or likely shortfall during the plan period; and • Recreational facilities within the open space will be enhanced by the proposed development on an appropriate portion of the open space; or • The community would gain greater benefit from the developer providing a suitable alternative recreational or amenity open space in an equally accessible and convenient location. The development of existing open space with an ecological value (a known biodiversity or nature conservation interest) will not be permitted.	Impacts to PRoWs, cycle tracks, footpaths and non-motorised routes are considered in section 30.7.5.8.

30.3 Consultation

19. Consultation is a key driver of the 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 tourism and recreation has been conducted through Expert Topic Group (ETG) meetings held in 2017, the Scoping Report (Royal HaskoningDHV, 2016) and the Preliminary Environmental Information Report (PEIR) (Norfolk Vanguard Limited, 2017). Full details of the project consultation process are presented within Chapter 7 Technical Consultation and responses are collated in a Consultation Report (Document reference 5.1), which will be submitted with the DCO application.

30.3.1 Informal consultation

20. Managing impacts on the tourism sector and people's enjoyment of recreational facilities is a process, much like any other social impact management. In line with best practice for managing social impacts outlined by the IAIA (Vanclay et al, 2015) and their own Principles of Engagement[2], Norfolk Vanguard Limited conducted informal consultation to inform the development of the project from Autumn 2016 – Q2 2017, ahead of the formal consultation process in November 2017 (described in Chapter 7 Technical Consultation). This allowed early identification of recreational and tourism assets that were important to people so that the project could avoid impacts on these as part of the design process. Table 30.3 summarises the consultation activities during this period (Norfolk Vanguard Limited, 2017).

Table 30.3 Summary of informal consultation as described in Statement of Community Consultation (Norfolk Vanguard Limited, October 2017)

Period	Newsletter	Adverts in local media	Press releases	Key stakeholder engagement	Consultation events	Participants	Follow-up
Autumn 2016	October: Project introduction & invitation to get involved	Yes	Yes	Yes	7 drop-in exhibitions held within the local area. Exhibition materials & Scoping report published.	788 present 105 provided feedback	Summary & Full reports /letter /FAQ update
Spring 2017	March: Project update & invitation to get involved	Yes	Yes	Yes	9 drop-in exhibitions held within the local area.	884 present 268 provided	Summary & Full reports /letter /FAQ update

[2] Available on the Vattenfall Wind Power Limited corporate website at: https://corporate.vattenfall.co.uk/globalassets/uk/communities/principles-of-engagement.pdf

Period	Newsletter	Adverts in local media	Press releases	Key stakeholder engagement	Consultation events	Participants	Follow-up
					Exhibition materials published.	feedback	
Summer 2017	June: Project refinements & next steps	No	Yes	Yes	No	No	FAQ update
	No	No	No	July: local focus groups on siting onshore electrical infrastructure.	4 locally themed workshops	180	Follow-up report & consultation materials published

30.3.2 Community Engagement

21. Since October 2016 consultation has been undertaken with local communities, varied organisations (including tourism bodies) and businesses (including tourist businesses) within Norfolk and particularly within the footprint of the onshore cable route. To date this has included the following activities:

- Drop in Exhibitions held at locations within and adjacent to the onshore project area;
    - October 2016;
    - March/April 2017; and
    - November 2017.
- Reports of community feedback shared with all registered participants, key local and community stakeholders, and on the project website[3];
    - Hearing your Views, I, II and III;
- Community engagement events;
- Direct discussions with landowners;
    - Norfolk Vanguard Limited has engaged with landowners regarding survey access, through consultation meetings and during the land referencing process. Letters were sent to all affected parties offering to meet to discuss the project proposals;
    - Norfolk Vanguard Limited's land agents have met with over 95% of the affected landowners and have liaised with the land agents representing those not met directly. A number of onshore cable route change

[3] https://corporate.vattenfall.co.uk/norfolkvanguard

suggestions have been put forward by those affected by the red line boundary and Vattenfall have been able to incorporate a number of those suggestions into the final design.

- Norfolk Vanguard Limited have engaged with over 350 different land interests including landowners, tenants, occupiers and other parties with land rights. Specifically, engaging with over 100 affected landowners and comments taken on board.

- Newsletters distributed throughout the Scoping Area (October 2017), and subsequently provided to those within a more focussed area closer to the onshore project area. These newsletters were distributed on the following dates:
  - October 2016;
  - March 2017;
  - June 2017;
  - October 2017; and
  - February 2018.
- Provision of a dedicated project website.

22. The project has employed a Local Liaison Officer who is the Skills and Education Champion, based full time in Norfolk, as well as procured support from a Norwich based Public Engagement agency. The project has continued to deepen and broaden engagement with organisations that support and represent the interests of people and businesses local to landfall, onshore cable route, onshore project substation and National Grid substation, and in the region.

23. Skills and education work to date has included working with local primary schools and developing a 3D modelling programme. This is aimed at providing an interactive learning experience for older students which provides insights into the considerations, constraints and opportunities associated with assessing the feasibility of offshore wind farm development. These programmes will be built upon and rolled out further to local students, including in partnership with the University of East Anglia during 2018 and in support of the New Anglia Energy Sector Skills Plan.

30.3.3 Formal consultation

24. A summary of the consultation that has been undertaken to date and has driven forward the development of this tourism and recreation assessment is provided in Table 30.4.

25. Consultation of relevance to tourism and recreation that has occurred previously for East Anglia ONE and East Anglia THREE Offshore Wind Farms (OWF) has also been considered, owing to the proximity of these developments to the project.

Table 30.4 Consultation responses

Consultee	Date /document	Comment	Response / where addressed in the ES
Stiffkey Parish Council	November 2016 (scoping response, statutory)	To be included in the ES: Specific sections/details on how public perception is to be addressed as part of the EIA – particularly given this is a tourist area and with the proximity of a number of AONB's and numerous SSSI.	A process of addressing public perception has already been started with an extensive community engagement programme. Public perception is considered in section 30.6.6 and 30.7.6.4
Secretary of State (SoS)	November 2016 (scoping response, statutory)	The Secretary of State notes that key maintenance activities associated with the onshore component would take place every summer (taking up to two months) and would potentially require 24/7 working during this period. The Secretary of State would expect to see specific consideration of any 24/7 maintenance working as part of the relevant topic chapters of the ES, and in particular potential impacts on nearby sensitive receptors (including tourism locations) and any mitigation measures proposed.	Detail on working hours and agreed mitigation will be included in the Outline Code of Construction Practice (OCoCP) (document reference 8.1), submitted as part of the DCO.
Secretary of State (SoS)	November 2016 (scoping response, statutory)	The Secretary of State welcomes the proposed tourism and recreation assessment and notes the North Norfolk WFD bathing waters and blue flag beaches in the vicinity of the proposed development. Potential impacts on water quality at these locations and the resultant impacts on tourism and recreation should be considered. Appropriate cross reference should be made to the Marine Water and Sediment Quality chapter.	Bathing waters and blue flag beaches have been included in the baseline in section 30.6.5 and addressed under sections 30.7.5.3 and 30.7.5.4.
Secretary of State (SoS)	November 2016 (scoping response, statutory)	Consideration should be given as to what impact the use of accommodation for the mobile workforce would have in the short, medium and long term situation for the local tourist	Use of accommodation by mobile work force has been addressed under section 30.7.5.6

Consultee	Date /document	Comment	Response / where addressed in the ES
		industry.	
Norfolk County Council	November 2016 (scoping response, statutory)	Where reference is made to Public Rights of Way (PRoW) and The Norfolk Coast Path (e.g. para. 902, para. 1,174), other Norfolk long-distance Trails should also be acknowledged (e.g. Paston Way which runs from Cromer to North Walsham and The Weavers Way which runs from North Walsham to Great Yarmouth). These long-distance trails also have promoted circular walks along their length, and all promoted routes might require mitigation if the cable route impacts them. There is large publicly-accessible Forestry Commission woodland, Bacton Woods, in the area where the cable may come ashore, which may need consideration. Seal-watching on the East coast, mostly at Horsey but now also elsewhere, is a major tourist attraction in winter, with a likely significant contribution to the local economy. A recent survey recorded >100 visitors per hour on the coast path during peak periods at Horsey (Visitor Surveys at European Protected Sites in Norfolk during 2015- 2016; Norfolk County Council/ Norfolk Biodiversity Partnership/ Footprint Ecology; July 2016). The EIA will need to consider the above recreational issues and the potential impacts arising from the planned onshore proposals.	PRoWs (including long distance routes referred to), footpaths, cycle tracks, Bacton Woods and seal watching activities have been included in the baseline in section 30.6.4 section 30.7.5.8.
Norfolk County Council	November 2016 (scoping response, statutory)	The EIA/PEIR will need to address the impact of the wind farm on tourism, including tourism occurring in neighbouring counties, which	This is included in the baseline of Chapter 29 Landscape and Visual Impact Assessment and addressed in section 30.7.5.5.

Consultee	Date /document	Comment	Response / where addressed in the ES
		may be affected if the natural landscape is altered sufficiently.	
Norfolk County Council	November 2016 (scoping response, statutory)	The EIA should consider the likely impacts on Norfolk's tourism sector.	This chapter considers these impacts in section 30.7.
Necton Parish Council	November 2016 (scoping response, statutory)	A comprehensive review of the combined impact of Vanguard and Boreas on the human, environmental and social aspects of the sub-station search area. Whilst this application is considering only Vanguard, it is reasonable to consider that Boreas will be offered a connection to the same National Grid substation and the combined impact must be a consideration in this process.	Cumulative impacts (including any which may occur with Norfolk Boreas) are considered in section 30.8.
Fulmodeston Parish Council	November 2016 (scoping response, statutory)	The rest of the coast is an area of high tourism and therefore unsuitable for the proposed large onshore converter station(s) due to the visual impact in an otherwise very rural location.	Visual impacts have been considered in Chapter 29 Landscape and Visual Impact Assessment. The selection of the HVDC electrical solution means that an onshore Cable Relay Station (CRS) is no longer required by the project and so has led to the removal of tourism and recreational impacts relating to the CRS. This is described in Chapter 4 Site Selection and Assessment of Alternatives.
Planning Inspectorate on behalf of the Secretary of State (SoS)	November 2012 East Anglia THREE Scoping Opinion/November 2015 East Anglia THREE ES Chapter 28 Socio-Economics Tourism and Recreation	Recreational impacts associated with the coastline in the vicinity of the cable landfall should be assessed including the possible effects on beach areas, PRoW and bathing water quality. Cross-reference should be made in this chapter of the ES to any visual impacts on PROW identified in the seascape, landscape and visual amenity assessments. Consideration should be given	Impacts on PRoW have been included in the baseline in section 30.6.4 and impact in section 30.7.5.8. The location of bathing waters and Blue Flag beaches has been included in the baseline, see Figure 30.1. Relevant impacts have been considered in sections 30.7.5.3 and 30.7.5.4. Use of accommodation by mobile work force has been

Consultee	Date /document	Comment	Response / where addressed in the ES
		as to what impact the use of tourist accommodation for the mobile workforce would have in the short, medium and long term situation for the local tourist industry.	addressed under section 30.7.5.6.
Norfolk County Council	March 2014/ November 2015 East Anglia THREE ES Chapter 28 Socio-Economics Tourism and Recreation	While the above East Anglia Three scheme is unlikely to raise any significant issues in its own right (in relation to Norfolk), there are wider issues which any proposal forming part of the East Anglia Array would need to address. In particular it is considered that the EIA/PEIR covering this and any other proposal, will need to address/consider the following cumulative impacts: (c) Economic Implications • Consideration of the opportunities for new business (e.g. involved in the manufacturing process and supply); • The wider economic implications including impacts on tourism – welcome reference in the Scoping letter to tourism and recreation; In addition, the ES should provide an indication of the likely impact on the local fishing industry particularly when other proposals are taken into account.	Cumulative impacts (including any which may occur with East Anglia Three) are considered in section 30.8. Economic implications are considered in Chapter 31 Socio-Economics. Impacts that could potentially result in economic change of tourism demand are covered in section 30.7.5.4. Impacts on fisheries are considered in Chapter 14 Commercial Fisheries.
Dereham Town Council	2017 (PEIR Response)	Responses regarding crossings of Dereham Footpaths (FP)9, FP19, FP20, Hoe FP5, and unclassified road 35131	Impacts to PRoWs are covered in Section 30.8. A full list of all PRoWs that the project interacts with is included in Appendix 30.1 and visualised in Figure 30.3.
East Rushton Parish Council and residents	2017 (PEIR Response)	Concerned that the photo montages of the Cable Relay Station (CRS) proposed at PEIR stage did not capture the true character of the area	The selection of the HVDC electrical solution means that an onshore Cable Relay Station (CRS) is no longer required by the project and

Consultee	Date /document	Comment	Response / where addressed in the ES
			so has led to the removal of tourism and recreational impacts relating to the CRS. This is described in Chapter 4 Site Selection and Assessment of Alternatives.
N2RS	2017 (PEIR Response)	Strong response against the need for a CRS and in favour of HVDC system	The selection of the HVDC electrical solution means that an onshore Cable Relay Station (CRS) is no longer required by the project and so has led to the removal of tourism and recreational impacts relating to the CRS. This is described in Chapter 4 Site Selection and Assessment of Alternatives.
Necton Parish Council	2017 (PEIR Response)	Request detail of how a "dark sky area" will be protected from onshore substation.	This has been included in Sections 30.6 and 30.8.
Necton Parish Council	2017 (PEIR Response)	Requests that four holiday-let businesses are included with tourism and recreational asset assessment.	This information has been checked against public information. Figure 29.7 of Chapter 29 Landscape and Visual Impact Assessment shows that 3 of 4 businesses may be affected. This has been included in section 30.8.3.2.4.
North Norfolk District Council	2017 (PEIR Response)	Accepts that the long-term impacts of the project would be "pretty benign" but requests that any impacts are minimised by appropriate programming and noise protection.	Section 30.8 describes mitigation of potential impacts to tourism receptors.
NSAG	2017 (PEIR Response)	Four holiday let businesses have not been included within the Tourism Asset assessment.	This information has been checked against public information. Figure 29.7 of Chapter 29 Landscape and Visual Impact Assessment shows that 3 of 4 businesses may be affected. This has been included in Section 30.6.5.
St Peters Ridlington	2017 (PEIR Response)	Objection to the CRS due to its impact on the amenity and landscape character of the	The selection of the HVDC electrical solution means that an onshore Cable Relay Station (CRS) is no longer

Consultee	Date /document	Comment	Response / where addressed in the ES
		surrounding area.	required by the project and so has led to the removal of tourism and recreational impacts relating to the CRS. This is described in Chapter 4 Site Selection and Assessment of Alternatives.
Suffolk County Council	2017 (PEIR Response)	Request to include additional projects in CIA.	These have been addressed in Section 30.8.

30.4 Assessment Methodology

30.4.1 Impact Assessment Methodology

26. Chapter 6 EIA Methodology details the general method undertaken to assess potential impacts of the project. Within the Evidence Plan Process described in Chapter 7 Technical Consultation, this methodology and the relevant study areas considered have been consulted on and agreed with the relevant stakeholders.

27. There are no specific statutory guidelines which inform the assessment of development impacts upon tourism and recreation receptors. The approach taken is therefore based on best practice. The assessment is in compliance with the Infrastructure Planning (EIA) Regulations 2017.

28. As discussed below, the assessment takes the position that the tourism economy is driven by tourism demand; that is how much visitors spend whilst in an area. Tourism supply meets this demand through the provision of goods and services by businesses such as hotels, restaurants, museums, etc. For the purpose of assessment, it is considered that a change in demand leads to a change in supply (i.e. fewer tourists would spend less money and businesses would experience a fall in revenue), however this has not been financially quantified due to the speculative assumptions needed at the current stage of assessment. Therefore, the assessment focusses on the factors that have the potential to reduce the number of tourists visiting or returning to an area.

29. It is considered that the main attraction of an area to tourists is its recreational assets, such as Areas of Outstanding Natural Beauty (AONB). These assets may also be enjoyed by local (recreational) users but it is assumed these people would not spend money in the tourism supply sector at a rate above their average (i.e. locals are unlikely to stay in hotels and would frequent local restaurants all year round). Therefore, impacts to these recreational assets are considered with regards how the impacts would change the user's experience of the asset (e.g. high mechanical noise levels would reduce the enjoyment of a natural area).

30. The baseline has been developed by considering a county, district, and local level. Firstly, a broad overview of the tourism sector of Norfolk County is presented to understand the main character and trends in tourism and recreation. Tourism trends and character are then considered at a district level for North Norfolk, Broadland, and Breckland to understand the main tourism draws to each area. Tourism and recreation assets are then considered within zones relative to the footprint of the project. This allows the assessment to consider the potential pathway from source to receptor category.

31. Patterns used to assess the tourism baseline include visitor numbers, visitor origin, expenditure, secondary benefits from tourism, and the timing of visitor periods.

32. As with other topics the assessment uses a source – pathway – receptor model to demonstrate the mechanism of a potential impact.

33. This analysis is based upon desk-based assessment reviewing facilities on websites such as Visit England, Visit Norfolk, and publicly available research at a District level, AONB, or National Park level. It was agreed through consultation with Norfolk County Council that specific public perception surveys would be disproportionate to the potential impacts considering the proactive community engagement that Norfolk Vanguard Limited are undertaking as part of the development process.

30.4.1.1 Tourism

34. The tourism economy is a subset of the wider socio-economy and gains financial value from the use of recreational assets. It is driven by how much visitors spend, referred to as tourism demand (ONS, 2013). Therefore, an assessment of the impact on tourism is dependent on information relating to visitor expenditure and on the impact a project may have on recreational or tourism assets.

35. Visitors spend money on products and services provided by a combination of industries such as accommodation services, food and drink serving activities, and passenger transport services. This combination of industries creates the tourism supply side of the tourism economy (ONS, 2013).

36. Visitor expenditure is driven by the attractiveness of various recreational or tourist assets. These include but are not limited to:

- Natural assets such as national parks or coastal areas;
- Cultural, religious, or historic assets such theatres, churches or castles;
- Sports or recreational assets such as amusement parks or sports venues; and
- Service assets such as hotels, caravan parks, food or drink serving businesses.

37. Real or perceived impacts to these assets may lead to a reduction in visitor numbers, length of stay, and expenditure. Therefore, the assessment will consider these assets as the main tourism receptors.

38. The potential impact of the project on tourism is based on the receptor sensitivity and magnitude of effect definitions identified in Table 30.5 and Table 30.6.

39. Consideration will also be given to trends that may increase or reduce the sensitivity of the receptors. For instance, although some towns may be regionally important and therefore of medium sensitivity, if the recent trend in visitor numbers has been declining then the people represented by these receptors will be more sensitive to disruption.

Table 30.5 Sensitivity / value of tourism receptors

Sensitivity / value	Definition
High	Nationally recognised tourist destinations such as National Parks or AONB
Medium	Regionally recognised tourist destinations and sites identified as important for future tourism regionally e.g. within the DPD, for example towns and villages along the coastline.
Low	Sites that are not tourist attractions in their own right but remain important for local tourism, such as local hotels, caravan parks and campsites.
Negligible	Sites with limited or no tourist attractions.

Table 30.6 Magnitude of effect on tourism receptors

Magnitude	Adverse / Beneficial	Definition
High	Adverse	Permanent disruption to a known tourist attraction.
High	Beneficial	Large scale or major improvement of a known tourist attraction.
Medium	Adverse	Temporary disruption to a known tourist attraction e.g. increased traffic congestion on roads serving the attraction.
Medium	Beneficial	Benefit to, or addition of, key characteristics, features, or elements or improvement of receptors quality.
Low	Adverse	Works are visible from the tourist attraction but there are no direct impacts.
Low	Beneficial	Minor benefit to, or addition of key characteristics, features or elements; some beneficial impact on the receptor or a reduction in the risk of a negative impact occurring.
Negligible	Adverse	Works that is unlikely to directly or indirectly negatively affect the attraction.
Negligible	Beneficial	Works that is unlikely to directly or indirectly positively affect the attraction.

30.4.1.2 Recreation

40. The same recreational assets enjoyed by visitors can be enjoyed by the local population, but this is more associated with quality of life rather than economic benefit (although these concepts are interrelated). For clarity, this assessment has categorised tourism assets as those that attract visitors (e.g. national parks) or supply visitors (e.g. food and accommodation businesses) and recreational assets as those that anybody can use to enjoy a natural asset (e.g. foot paths). The potential impact of the project on recreation is based on the receptor sensitivity and magnitude of effect definitions identified in Table 30.7 and Table 30.8.

Table 30.7 Sensitivity / value of recreation receptors

Sensitivity / value	Definition
High	Recreational feature of national value such as National trails or paths e.g. Norfolk Coastal Path.
Medium	Recreational feature of regional value, such as PRoW (footpaths, bridleways and byways), stewardship bridleways.
Low	Recreational feature of local value, e.g. local permissive pathways, open access land and local beaches used for recreation such as angling and walking.
Negligible	Recreational feature with limited or no recreational value.

41. Recreation impacts are considered on the proximity of recreational assets to the footprint of the project and the duration of effect. Spatial datasets are used to understand where the project may disturb spaces that have been assigned for recreation or Public Rights of Way (PRoW). This is supported with access and recreation studies of notable areas such as the Norfolk AONB, and the Norfolk Broads.

Table 30.8 Magnitude of effect on recreation receptors

Magnitude	Adverse/beneficial	Definition
High	Adverse	Permanent closure of a recreation feature or permanent reduction in amenity value.
	Beneficial	Large scale or major improvement of the facilities quality; extensive restoration or enhancement; major improvement of receptor quality.
Medium	Adverse	Temporary closure or disruption to a recreation feature or temporary reduction in amenity value (works within 100m of the feature).
	Beneficial	Benefit to, or addition of, key characteristics, features, or elements or improvement of receptors quality.
Low	Adverse	Temporary reduction in amenity value of a recreation feature (works between 100m and 250m).

Magnitude	Adverse/beneficial	Definition
	Beneficial	Minor benefit to, or addition of key characteristics, features or elements; some beneficial impact on the receptor or a reduction in the risk of a negative impact occurring.
Negligible	Adverse	No direct impact to feature and no amenity loss (works in excess of 250m distance separation).
	Beneficial	Minimal benefit.

30.4.1.3 Impact significance

42. Following the identification of receptor sensitivity and magnitude of the effect, the significance of the impact will be considered using the matrix presented in Table 30.9.

Table 30.9 Impact significance matrix

		Negative magnitude				Beneficial magnitude			
		High	Medium	Low	Negligible	Negligible	Low	Medium	High
Sensitivity	High	*Major*	*Major*	*Moderate*	*Minor*	*Minor*	*Moderate*	*Major*	*Major*
	Medium	*Major*	*Moderate*	*Minor*	*Minor*	*Minor*	*Minor*	*Moderate*	*Major*
	Low	*Moderate*	*Minor*	*Minor*	*Negligible*	*Negligible*	*Minor*	*Minor*	*Moderate*
	Negligible	*Minor*	*Negligible*	*Negligible*	*Negligible*	*Negligible*	*Negligible*	*Negligible*	*Minor*

43. Table 30.10 details the definitions of each impact significance.

Table 30.10 Impact significance definitions

Impact Significance	Definition
Major	Very large or large change in receptor condition, both adverse or beneficial, which are likely to be important considerations at a regional or district level because they contribute to achieving national, regional or local objectives, or, could result in exceedance of statutory objectives and / or breaches of legislation.
Moderate	Intermediate change in receptor condition, which are likely to be important considerations at a local level.
Minor	Small change in receptor condition, which may be raised as local issues but are unlikely to be important in the decision-making process.
Negligible	No discernible change in receptor condition.
No impact	No change, therefore no impact on receptor condition.

44. Potential impacts identified as major or moderate are regarded as significant in the impact assessment and have been avoided or reduced through mitigation where possible. In addition, whilst minor impacts are not significant in their own right, it is important to distinguish these from other non-significant impacts as they may contribute to significant impacts cumulatively or through interactions.

30.4.2 Cumulative Impact Assessment

45. As detailed in Chapter 6 EIA Methodology, a comprehensive CIA has been prepared for the project. This has taken account of the potential adverse and beneficial impacts of constructing the project in the same construction period as other major infrastructure projects planned in the area. The CIA for Norfolk Vanguard has been undertaken in consultation with Norfolk County Council, and full details on CIA are discussed in Chapter 6 EIA Methodology.

46. The cumulative assessment for the operational phase only considers the effect of the presence of onshore infrastructure from multiple projects (e.g. noise and visual impact); there will not be effects from the presence of the offshore wind turbines due to their distance from the coast. A cumulative assessment for the decommissioning phases has also been included although a full assessment for the decommissioning phase would require knowledge of future projects to a granularity that is currently unavailable and so professional judgement has been applied.

30.4.3 Transboundary Impact Assessment

47. The project is required to consider the possibility of significant transboundary effects on another European Economic Area (EEA) member states under the Espoo Convention (see Chapter 6 EIA Methodology). However, given that any tourism and recreation effects will be purely within the east of England area there is no potential for transboundary impacts. Transboundary impacts are therefore scoped out of this assessment and will not be considered further.

30.5 Scope

30.5.1 Study Area

48. A tourism and recreation baseline has been developed for the county of Norfolk.

49. The study areas for assessment will include:

- Direct impacts (such as noise, air quality, traffic, visual disturbance, closures and other disruptions) to the area within 500m of the landfall, onshore project substation, onshore cable route and National Grid substation extension including National Grid overhead line temporary work area. A distance of 500m

is considered to be conservative and direct impacts to tourism and recreation assets are not anticipated to occur beyond this distance;

- Indirect impacts to the county of Norfolk and districts of North Norfolk, Broadland, and Breckland, based on the location of landfall, onshore cable route, and onshore project substation;
- Accommodation impacts in relation to the county of Norfolk due to the assumed commuter times for in-migrant workers outlined in Chapter 24 Traffic and Transport; and
- Marine tourism and recreation impacts by considering businesses or water sport facilities from Lowestoft up to Wells-next-the-Sea.

50. Note that the potential for landscape and visual impacts of the offshore elements of the project upon onshore receptors was considered, however these have been scoped out as the project would be located an approximate distance of 47km (closest point) from the coast; this would be well beyond the 35km limit of visual significance identified in Department of Trade and Industry (DTI) guidance and more than double the recommended distance in the UK Offshore Energy Strategic Environmental Assessment 3 (OESEA3). Calculations establish that the wind turbine generators would be visible to a range of 43km at sea level, based on their height and the curvature of the earth. There is a limited possibility that blade tips may be visible from elevated points onshore, although their very small scale, seen at a range of beyond 47km would make them barely discernible. Therefore, after 47km impacts on tourism perception of the landscape due to the offshore wind farm array are not included in the assessment. Disturbances to marine tourism due to the construction of the offshore cable corridor have however been included.

51. The Norfolk Broads and the North Norfolk Coastline warrant special attention because they are nationally important areas. Although the project has been specifically designed to avoid the largest tourism assets, construction works may have an indirect impact. The potential pathways for impacts on these receptors have been considered.

30.5.2 Data Sources

52. Data sources have been reviewed and used to characterise the baseline for the assessment. These are shown in Table 30.11 and a degree of confidence in the data source has been assigned.

Table 30.11 Data sources

Data	Year	Coverage	Confidence	Notes
Tourism, and recreation research commissioned by tourism authorities	2005 to 2017	Norfolk as a whole and divided by districts	High	Research from Norfolk Council District Councils Visit Norfolk and Visit England

Data	Year	Coverage	Confidence	Notes
Economic Data for Norfolk	2011 to 2017, where applicable	Norfolk as a whole and divided by districts	High	ONS data collated by collated by Norfolk Insight at http://www.norfolkinsight.org.uk/
Norfolk Limited	2016 and 2017	Norfolk as a whole	High	Summary of annual analysis conducted by Grant Thornton
Visit England Accommodation Stock Audit	2016	Norfolk	High	Source: Visit Britain
Geospatial information	2016	Norfolk	High	From Ordnance Survey and Norfolk Open Data portal showing PRoW
Blue flag beaches	2017	Norfolk	High	Source: Foundation for Environmental Education
Accommodation locations by survey of online booking websites such as Expedia or Booking.com	2017	Norfolk	Medium	Some hotels and B&Bs may be missing however the data still shows the trend of locations within Norfolk
www.visitnorfolk.co.uk	2017	Norfolk	High	Details of tourist activities
www.broads-authority.gov.uk	2017	Norfolk and Suffolk Broads	High	Details of Broad activities
www.happisburgh.org	2017	Happisburgh	High	Details of local events and activities at Happisburgh
www.tournorfolk.co.uk	2017	Norfolk	High	Details of tourist activities
www.seapalling.com	2017	Sea Palling	High	Details of local events and activities at Sea Palling
https://www.visitbritain.org/annual-survey-visits-visitor-attractions-latest-results	2017	UK	High	Details of tourist activities

30.5.3 Limitations

53. Publicly available studies of the economic impact of tourism on the economy of Norfolk have been undertaken by a third party and generally use the Cambridge Economic Model (see section 30.5.3). This is a computer-based model developed to calculate estimates of the volume, value and economic impact of tourism on a county or district basis. The model relies on using information from a range of sources. It also does not take account of leakage of expenditure of tourists taking day trips out of the area in which they stay, although it is assumed these balance out. As the methodology and accuracy of these sources varies, the estimates can only be regarded as indicative of the scale and importance of visitor activity in the local area.

54. Many of the impacts to tourism and recreation are based on qualitative assessment, using a predicted perception of how local communities and tourists might change their activities particularly during construction. This can be complicated to predict as different individuals will perceive things in different ways but it is assumed that differences in opinion would balance on average. The ongoing community engagement (section 30.3.2) as part of the project development is supporting Norfolk Vanguard Limited's understand these potential effects.

30.5.4 Assumptions

55. As discussed in Chapter 5 Project Description, it is estimated that the required work force resource, across the onshore route length, would peak to 250-420 operatives during the two-year duct installation works depending on the scheduling of works.

56. Resident workers are assumed to be those who live within 1.5 hour commute of the onshore works; broadly the Norfolk/Suffolk area. Although Norfolk Vanguard Limited has committed to 50% UK Content in the project as a whole, for the purposes of this assessment the worst case scenario is considered to be that 70% of the onshore construction work force will be non-resident (i.e. from outside the Norfolk/Suffolk area).

57. The level of local procurement during construction is described in Chapter 31 Socio-Economics. The likelihood that the project will be able to procure staff locally will depend on the specificity of technical expertise required. For example, it is assumed that there are a higher number of contractors that could provide duct installation services than could provide substation construction services. Therefore, in Chapter 31 the level of local content has been varied below 70%. However, for the purposes of a worst case scenario for impacts on accommodation availability an average of 70% at peak construction has been assumed.

58. Supply Chain analysis in Chapter 31 Socio-Economics shows that it is unlikely that a significant proportion of the offshore works could be procured in the New Anglia region or in the vicinity of the cable route. Therefore, it is assumed that offshore construction workers would travel in from other locations and operational workers would be locally based; impacts due to these workers have therefore not been included.

30.6 Existing Environment

59. The following section provides a tourism and recreation baseline profile for the project. The baseline gives an overview of tourism trends in Norfolk, before focussing on key tourism and recreation assets offshore, at the coast, and onshore.

30.6.1 Tourism in Norfolk

60. The tourism industry is important for supporting employment across Norfolk where it accounts for 17.9% of all employment. It is especially important along the north Norfolk coast where it accounts for 28% of employment as well as in Norwich, the Broads and the east coast resorts of Great Yarmouth and Lowestoft. (Visit Norfolk, 2016)

61. Norfolk has a rural character punctuated by market towns and villages. The coastline has long sandy beaches and quaint coastal towns. There is a strong sense of heritage and conservation in the area demonstrated by the Visit Norfolk marketing (Visit Norfolk, 2017). Visitor surveys show that the majority of visitors travel from within the UK and come to enjoy being in the countryside.

62. Norfolk is situated within reasonable distance of major urban centres such as Peterborough, Cambridge, Milton Keynes, and London. This appears to be supporting a steady increase in day trips to Norfolk since 2010 and accompanying expenditure (Table 30.12).

63. This combination of positive factors is reflected in strong business confidence, and a significant level of employment in supplying the tourism industry.

30.6.1.1 Tourism statistics in Norfolk

64. Tourism in Norfolk supports over 61,500 jobs (17.3% of employment) and contributes £3.055 billion to the county's economy[4]. Although the value of the tourism continues to grow across the region (Larking Gowen, 2017), the industry faces challenges and opportunities including unreliability of good weather, introduction of the National Living Wage (NLW) for employees and the implications to the value of the pound through Brexit effecting holiday choices of domestic and foreign tourists. The New Anglia Local Enterprise Partnership (New Anglia LEP) recognises tourism as one of nine sectors of genuine strength and economic opportunity to engage with and support. The site selection process for Norfolk Vanguard has ensured that key tourist locations in the county (including the Broads and tourist beaches) have been avoided.

65. Visit Norfolk publishes annual Economic Impact studies for Norfolk. Key trends from these studies are shown in Table 30.12 for the period 2010 to 2015 (the latest available data). The trend shows that visitor numbers and expenditure are generally increasing year on year, however the number of overnight trips is decreasing. It should also be noted that of the overnight visitors, the majority are also from the UK. In combination with day visitors, this shows the majority of Norfolk tourism results from residents of the UK.

[4] http://www.visitnorfolk.co.uk/tourism-info-and-stats.aspx

Table 30.12 Tourism trends in Norfolk

	2010*	2011	2012	2013	2014	2015
Number of day trips	27,274	31,228	30,058	36,074	39,982	39,665
Day trip expenditure (£)	1,099,888	1,241,684	1,207,439	1,264,767	1,359,621	1,425,355
Number of overnight stay trips	3,968	3,399	3,373	3,034	3,008	3,083
Overnight stay trip expenditure (£)	705,270	685,971	709,000	642,392	711,910	717,510
Total (no. of trips)	31,242	34,627	33,431	39,108	42,990	42,748
Total expenditure (£)	1,857,896	1,953	2,056,208	2,046,322	2,093,804	2,163,973
Induced spend (£)	819,713	833,292	837,105	802,698	867,241	891,132
Tourism value (£)	2,677,609	2,786,197	2,781,197	2,740,672	2,961,045	3,055,105
Total tourism employment (no. of people)	51	54	54	55	60	62
Proportional employment	14.50%	15.30%	15%	15%	16.80%	17.30%

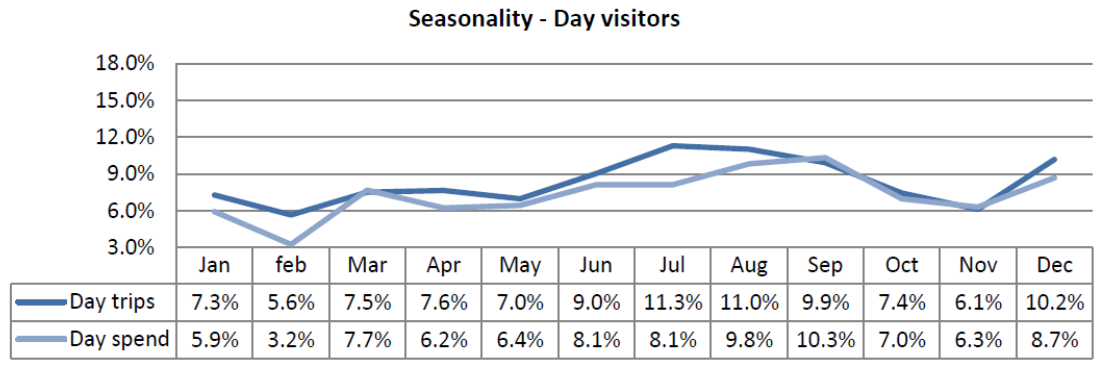
Source: Visit Norfolk

*All figures are in 1,000's (except %)

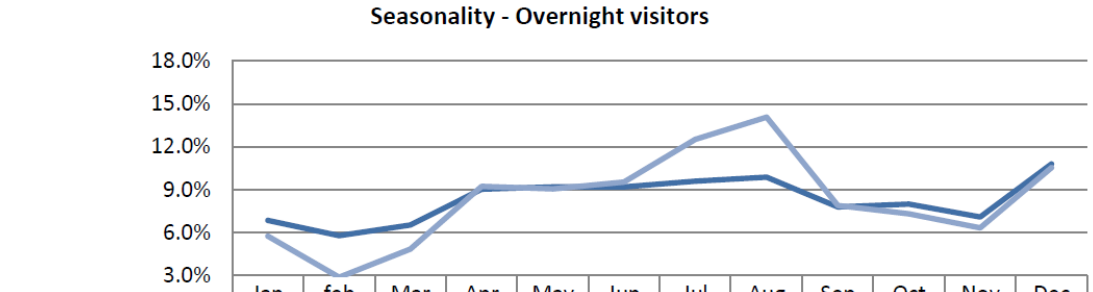
66. The 2015 report also provides an overview of the seasonality of visitors to Norfolk (Plate 30.1). This shows that there is a general increase in both day and overnight visits across the summer months, as can be expected. It also shows spikes in expenditure around March and September (Visit Norfolk, 2015).

67. As shown in Plate 30.2 the majority of visitors are coming on holiday and staying in paid accommodation. The majority of their expenditure is on shopping, food and drink. Comparison with economic impact assessments of Breckland and North Norfolk show the same trend at a district level.

68. The Visit Norfolk economic assessments also provide UK figures for reference. These suggest that overnight visitors in the UK tend to stay with friends and relatives (28%), in serviced accommodation (27%), or in static caravans (17%). People also tend to stay more nights with friends and relatives or in static caravans (both 23%) but spend considerably more when staying in serviced accommodation (31%). As shown in Plate 30.2, this is not because they spend more on accommodation but because they spend more on other items like food or shopping. This shows that impact on overnight visitors would lead to a subsequent impact elsewhere in the tourism supply economy.



	Jan	feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Day trips	7.3%	5.6%	7.5%	7.6%	7.0%	9.0%	11.3%	11.0%	9.9%	7.4%	6.1%	10.2%
Day spend	5.9%	3.2%	7.7%	6.2%	6.4%	8.1%	8.1%	9.8%	10.3%	7.0%	6.3%	8.7%



	Jan	feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Overnight trips	6.9%	5.8%	6.5%	9.0%	9.2%	9.2%	9.6%	9.9%	7.8%	8.0%	7.1%	10.8%
Overnight spend	5.8%	2.9%	4.8%	9.2%	9.1%	9.5%	12.5%	14.1%	7.9%	7.3%	6.3%	10.5%

Plate 30.1 Seasonality of Norfolk visitors (source: Destination Research, 2016)

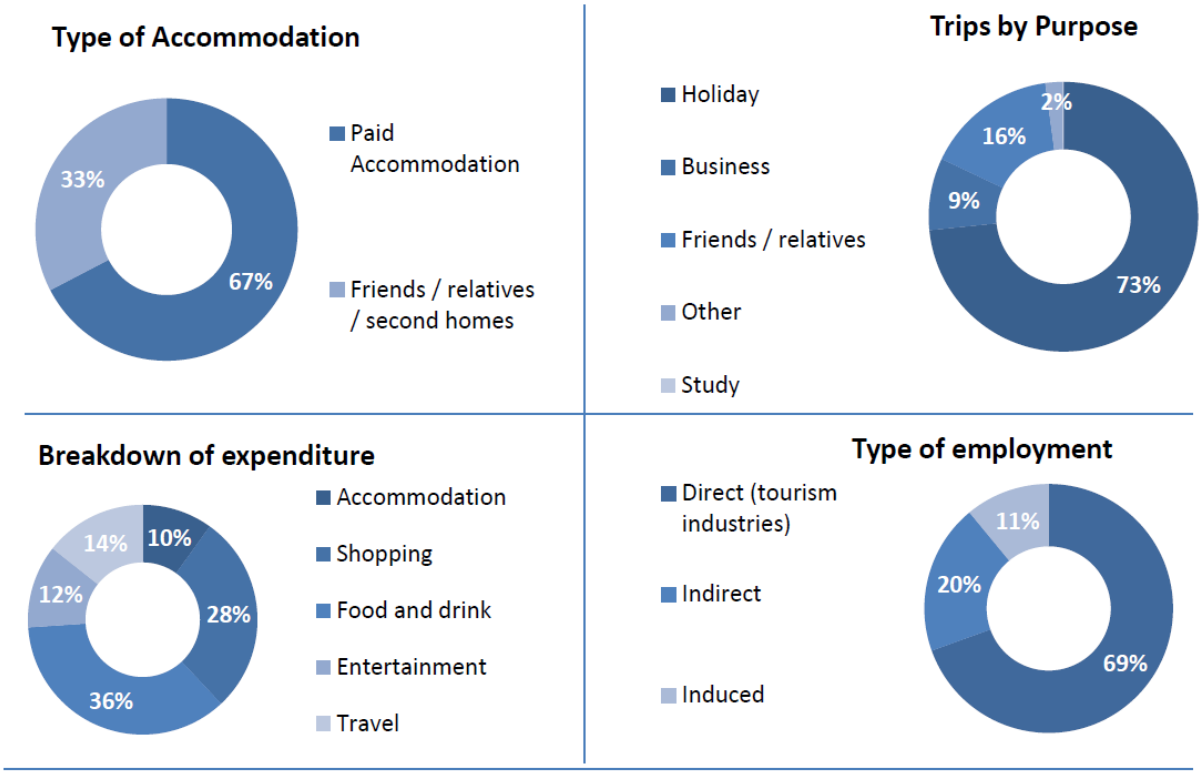


Plate 30.2 Breakdown of Norfolk visitors (source: Destination Research, 2016)

69. Visit Norfolk also produces Business Confidence data on a quarterly basis. June 2017 data was originally studied for the PEIR for the project, and a comparison with March 2018 data is now included in Table 30.13.

Table 30.13 Business Confidence data

June 2017	March 2018	Change
71% were "satisfied with the 2017 performance so far"	80% were "satisfied with their performance since the start of the year"	An increase of 9%
70% are "confident about their immediate future"	75% are "confident about their prospects for Easter"	An increase of 5%
75% report "good levels of advanced bookings"	37% report "good levels of advanced bookings"	A significant decrease but probably explained due to the time of year (i.e. early in the season).
52% "expect to generate growth this year"	38% "expect to generate growth this year"	

70. This level of confidence is mirrored in Business Confidence reports per quarter up to June 2015 (the oldest published by Visit Norfolk). This confidence mirrors the annual growth trend shown in the economic impact assessment in Table 30.12.

71. Of the districts in Norfolk, the most popular destination is Norwich with 32% of visits and 44% of expenditure. This is due to large secondary expenditure from shopping and food and drink. As the area affected by the project (i.e. the onshore cable route and project substation) is primarily rural, Norwich skews the data and therefore has been omitted from Plate 30.3 and Plate 30.4. Plate 30.3 and Plate 30.4 show that North Norfolk receives the most visitors per year of any of the districts and generates the second highest expenditure after Great Yarmouth. This is most likely because Great Yarmouth receives the most overnight visitors (possibly due to the ferry port) which generates a larger induced expenditure from food and drink or shopping.

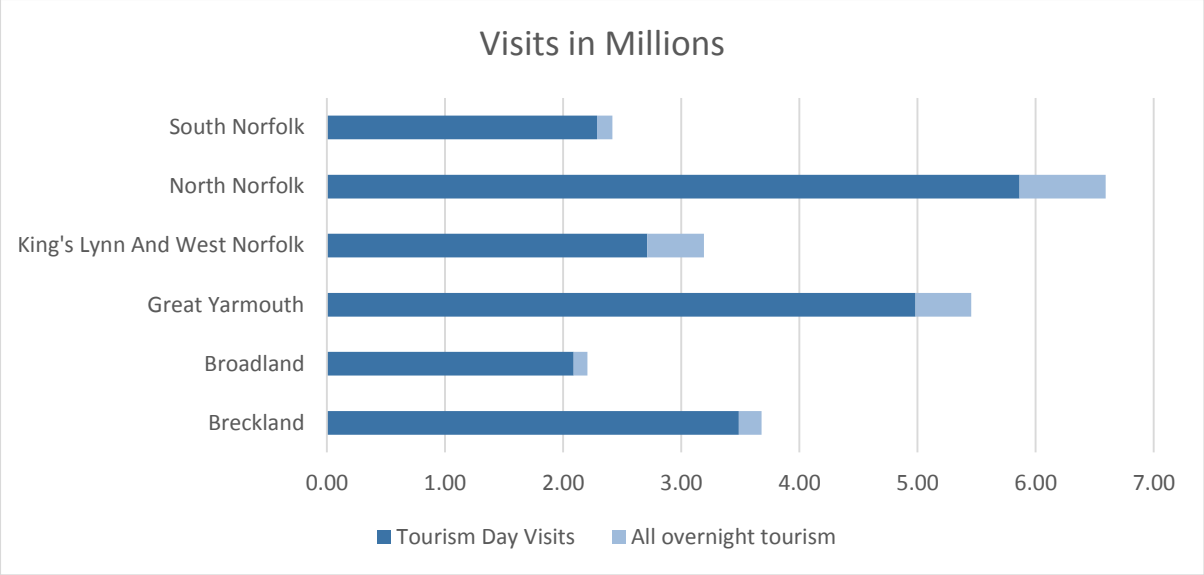


Plate 30.3 Average visits per district from 2013 to 2015 (Source: Visit Britain)

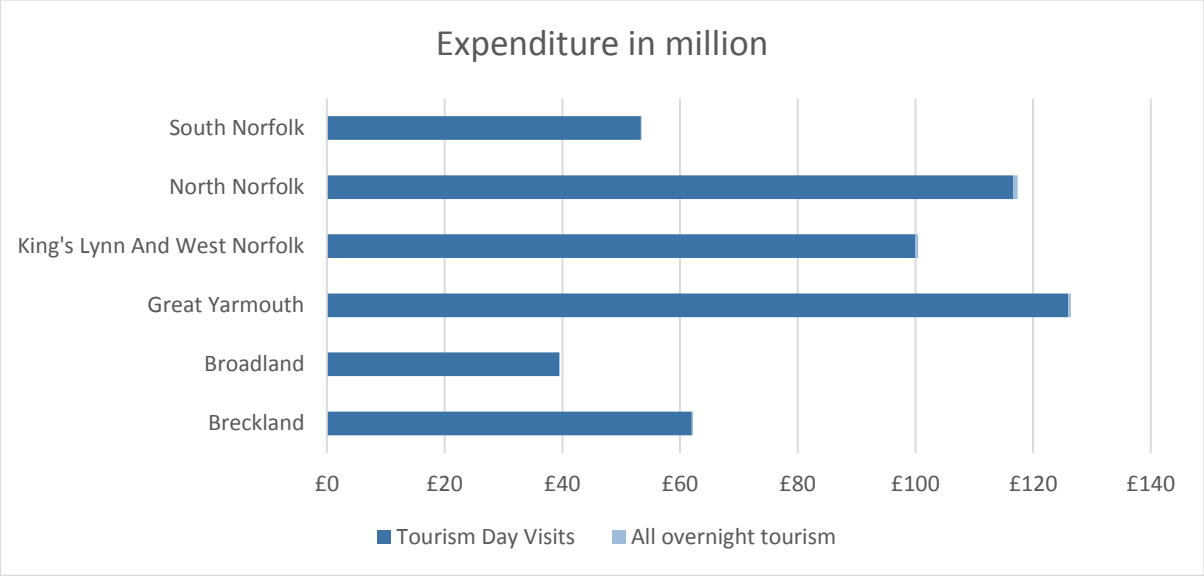


Plate 30.4 Average expenditure per district from 2013 to 2015 (Source: Visit Britain)

72. Visit Norfolk's 2014 Perceptions Study (Visit Norfolk, 2014) indicates the following points about Norfolk:

- Visitors are most likely from East Midlands and East of England;
- These visitors are more likely than non-visitors to like the outdoors, history and 'hands-on' activities;
- Holiday parks and hotels are the most popular types of accommodation;
- More recent visitors are also the more frequent visitors, and also usually return to the same areas;
- With regards to towns or cities, visitors are most likely to visit Norwich, Great Yarmouth, and then Cromer;

- The Broads stands out as particularly popular area;
- More rural areas are less appealing;
- Being a coastal county seems to be Norfolk's biggest asset; and
- The 'great outdoors' is also key to Norfolk's appeal.

73. However, the same report also indicates the following barriers to tourism in Norfolk;

- Poor transport links and accessibility are the main barriers to visiting, or visiting more frequently;
- Once in Norfolk, some feel there is not much to do;
- Norfolk is seen as "similar to counties on the South coast… but perhaps less appealing";
- Visits are typically quite short; and
- Tourism is strongly weighted to the summer months.

74. Visitor numbers in Norfolk are increasing and it is tourists' perception that activities such as walking, using the beach, or enjoying the scenery have the greatest appeal. Therefore, tourism assets relating to outdoor activities can be considered more sensitive than those relating to indoor activities.

75. The primary driver of the tourism sectors in North Norfolk, Broadland, and Breckland is the unspoilt countryside. Therefore, the following key assets will be explored:

- Norfolk Coast AONB which is managed by the Norfolk Coast Partnership, which is primarily in North Norfolk;
- The Norfolk Broads National Park which is managed by the Broads Authority is primarily in Broadland but has a catchment that extends much further than this; and
- Thetford Forest in Breckland that is managed by the Forestry Commission.

30.6.1.2 North Norfolk assets

76. North Norfolk has four Blue Flag Beaches and two Seaside Award beaches, historic villages, seaside resort villages, outstandingly beautiful coastal countryside, and businesses geared towards promoting the natural value of the area. Although its tourism industry is dominated by coastal regions, the quality of the landscape inland is high and is enjoyed for recreation (as described in section 30.6.4).

77. The Norfolk Coast AONB is an area designated by Natural England for conservation due to its significant landscape value. It covers over 450 km^2 of coastal and agricultural land from The Wash in the west through coastal marshes and cliffs to the sand dunes at Winterton in the east, and comprises three separate areas, extending to mean low water and including coastal hinterland up to about 6km inland that has a visual and functional relationship with the coast. The AONB provides many activities for visitors, including bird watching, cycling, walking, history and heritage,

nature reserves, craft shops and galleries. The AONB is located 4.9km from the landfall at its closest point and therefore direct impacts of the project upon The Norfolk Coast AONB have been avoided.

78. The Norfolk Coast Partnership lists around 380 individual tourism assets split across the following 20 categories:

- Beaches;
- Cycle hire;
- Cycle Routes;
- Eating Out;
- Farmers Markets;
- Local Food Producers;
- Public Toilets;
- Horse Friendly Accommodation;
- Horse Riding;
- Historic Sites;
- Local Shops;
- Nature Focus;
- Arts and Crafts;
- Tourist Information;
- Walks;
- Walks, Easy Access;
- Parishes;
- School/Group Visits;
- Transport; and
- AONB Office.

30.6.1.3 Broadland assets

79. The Norfolk Broads National Park is Britain's largest protected wetland and an important tourist attraction for activities such as wildlife spotting, boating and scenic walks, the most northern extent of The Broads is East Ruston. The Norfolk Broads National Park is over 2km from the onshore cable route and therefore direct impacts upon The Broads will be avoided. However, construction for the onshore cable route will cross several rivers that flow towards The Broads. These are detailed in Chapter 20 Water Resources and Flood Risk and summarised in Section 30.6.4.1.

30.6.1.4 Breckland assets

80. Breckland is so called because of The Brecks, which are areas of heath and lowland forest. The Brecks span an area of 1,019km^2 across Norfolk and Suffolk. Thetford Forest and Kings Forest, collectively the largest lowland forest in the UK, have miles of tranquil trackways and paths for walkers.

81. Visit Norfolk lists the following Highlights of Breckland, shown below with approximate distance from the onshore project substation:

- Thetford Forest – 17km;
- Oxburgh Hall – 16km;
- St George's Distillery – 24km;
- Pingo Trail – 14km;
- Grime's Graves – 21km; and
- Thetford – 26km.

82. Therefore, the project will have no impact on these assets due to them being over 10km from the onshore project area.

83. The Breckland Partnership lists the following Local Attractions (included with distance from the onshore cable route):

- Brandon Country Park – 27km;
- Ancient House Museum – 26km; and
- West Stow Anglo Saxon Village and Museum – 40km.

84. The Bure Valley narrow gauge railway is Norfolk's longest narrow-gauge railway and runs through the Norfolk Broads between Aylesham and Wroxham. This has been avoided through site selection.

85. The National Trust's Blickling Estate, with 384ha of woodland and parkland and 1,410ha of farmland, has been avoided through the site selection process.

86. Gressenhall Farm and Workhouse, located 3km north east of Dereham, is situated 1km from the onshore cable route. It hosts a museum, a traditional farm and an adventure playground within its grounds and holds public events and activities throughout the year. The site selection process has ensured that these assets are not directly affected.

87. Hunters Hall provides a wedding venue in Dereham.

88. Scheduled monuments, discussed further in Chapter 28 Onshore Archaeology and Cultural Heritage, have been avoided through the site selection.

89. The site selection process has taken account of the locations of key accommodation facilities including camping and caravanning sites, hotels and bed and breakfasts to minimise disturbance to these facilities. Therefore, none of these assets have been directly affected by the project.

30.6.1.5 Visitor surveys of European Protected Sites across Norfolk

90. In January 2017, Footprint Ecology published findings of a survey of European protected sites across Norfolk. This identified the following sites in the vicinity of the onshore cable route:

- Paston Great Barn;
- Norfolk Valley Fens;
- North Norfolk Coast;
- River Wensum; and
- The Broads.

91. The survey makes the following key findings that are pertinent to this project:

- Over half (52%) of interviewees were visiting from home and resident within Norfolk.
- Dog walking (41%) and walking (26%) were the most popular activities overall, but with large variations depending on the sites.
- Two thirds (66%) of interviewees were on a short trip from home and around a third (32%) of interviewees were on holiday.
- Holiday-makers were typically staying in self-catering accommodation (31%) or campsite/caravan sites (29%).
- In the Broads over half (59%) of the holiday makers interviewed were staying on a boat.
- The most commonly reported duration on site was 1 to 2 hours (31%), closely followed by between 30 and 60 minutes (27%).
- Over three quarters (77%) of all interviewees had arrived at the interview location by car.
- 'Close to home' was one of the main reasons people gave for choosing the site where interviewed that day.

92. These results show that more visitors to European protected sites are visiting for recreational purposes (walking, dog walking, etc.) than for tourism. Negative impacts on these areas will reduce the quality of recreational facilities for local residents as well as reducing the attractiveness of the area to potential tourists.

30.6.2 Nearshore Tourism and Recreation Receptors

93. As the site of the wind farm is 47km offshore (to the nearest point of Norfolk Vanguard West), recreational and tourism related activities at the wind farm site are limited, with some sailing and sea angling taking place nearby. Therefore, consideration will be focused on potential impacts as a result of construction at the landfall.

30.6.2.1 Sailing

94. There are nine sailing clubs from The Wash around to Lowestoft, of which eight clubs sail dinghies close to the shore on the Broads. One club at Lowestoft has the facilities for yachts that would be capable of travelling far enough out to sea to interact with the wind farm area.

95. The RYA cruising routes in the vicinity of the project were analysed, and no cruising routes were found to intersect the OWF sites.

96. Four medium use RYA cruising routes intersect the offshore cable corridor. Two of these routes are between the UK and the Netherlands, and cross the offshore cable corridor south of Norfolk Vanguard West. The remaining two are coastal routes crossing the corridor near the landfall.

97. Chapter 15 Shipping and Navigation discusses recreational vessel activity recorded during marine traffic survey. Limited activity was recorded in the study area during the summer period, and only one sailing vessel was recorded in Norfolk Vanguard West during the winter period.

Table 30.14 Sailing clubs in North Norfolk

Name	Location	Type
Ouse Amateur Sailing Club	King's Lynn	Dinghy
Hunstanton Sailing Club	Hunstanton	Dinghy
Brancaster Staithe Sailing Club	Brancaster Estate	Dinghy
Wells Sailing Club	Wells-next-the--sea	Dinghy
Norfolk sailing school	Holt	Dinghy
Hickling Broad Sailing Club	Hickling	Dinghy
Rollesby Broad Sailing Club	Great Yarmouth	Dinghy
Great Yarmouth & Gorleston Sailing Club	Great Yarmouth	Dinghy
Royal Norfolk & Suffolk Yacht Club	Lowestoft	Yachts

30.6.2.2 Diving

98. There are no known dive sites in the OWF sites (covering both Norfolk Vanguard East and West), with diving in Norfolk focused on gullies and wreck sites off Blakeney, Sheringham and West Runton in North Norfolk.

99. Anglian Divers launch from the beach at Sea Palling to visit the Norfolk chalk reef which runs from Cley-next-the-Sea to Trimingham, and wreck sites along the coast (British Sub Aqua Club, 2016). This is not regarded as a nationally important dive site in the UK. There are nine offshore reefs and several wrecks at various depths between 18m and 40m including the Walkure which ran aground on the Haisborough Sand Bank (BSAC, 2003). Offshore archaeology is considered further in Chapter 17 Offshore and Intertidal Archaeology and Cultural Heritage.

30.6.2.3 Other marine activities

100. There are no hire facilities for other marine activities (such as kayaking, jet skiing, or dinghy sailing) in close proximity to the landfall. Sea Palling has a jet ski and boat launching facility which includes the launch of dive vessels (Beach Rock Leisure, 2015). There are no scheduled boat trips which cross the OWF sites.

30.6.3 Coastal Tourism and Recreation Receptors

101. The North Norfolk Coast is highly regarded for its unspoiled beaches and, as such, has been designated as an AONB. The landfall search area has been located south of the AONB to remove direct impacts. There are, however, some receptors that have the potential to be indirectly impacted.

102. There are six Blue Flag beaches in Norfolk, as shown on Figure 30.1, three of which are considered in this assessment. These are Sea Palling, Mundesley and Cromer which are located approximately 5.5km southeast, 8.5km northwest and 20km northwest of the Happisburgh South landfall respectively (Explore Norfolk, 2017). The beach at Mundesley has also been noted as one of Norfolk's top ten beaches by Visit Norfolk (2017). There are ten Designated Bathing beaches between Great Yarmouth and Sheringham (the closest being Mundesley and Sea Palling), all of which have been classed as excellent (Environment Agency, 2017).

103. Seal watching on the east coast (mostly at Horsey but also other locations along the coast including Sea Palling) is a major tourist attraction in the winter, and a recent survey recorded more than 100 visitors per hour on the coast path during peak periods at Horsey. The same surveys noted that along the North Coast and East Coast of Norfolk, the main activities were dog walking, walking and wildlife/scenery viewing (Footprint Ecology, 2016).

30.6.3.1 Landfall

104. The landfall location at Happisburgh is easily accessible via public carparks and concrete ramps to the north and south. The beach and coastal path are regularly used locally by walkers and dog walkers.

105. The beach consists of clean sands, with some areas of cobble and gravel. A series of wooden groynes are present on the beach, including short broken sections protruding from the sand at low tide which would make swimming and paddling activities hazardous at certain sections of the beach.

106. The Happisburgh Conservation Area (assessed in Chapter 28 Onshore Archaeology and Cultural Heritage) includes the distinctive red and white striped Happisburgh Lighthouse. This is 26m tall and is the oldest working lighthouse in East Anglia, and the only independently run lighthouse in Great Britain. The lighthouse is open to the public on occasional Sundays and Bank Holidays throughout the summer months.

107. The RNLI Happisburgh Lifeboat Station is located to the southern end of the landfall location at Cart Gap and includes a gift shop. An annual Lifeboat Day Fete is held each summer.

108. Smallsticks Café is located on farmland along Cart Gap Road, to the south of the landfall search area. A number of pubs and other cafes are also present in the local area. Six hotels/Bed and Breakfast establishments are present in Happisburgh.

109. Sussex Crafts is a small business producing collectable miniatures located in Rollesby Way, off Cart Gap Road.

110. St Mary's church, situated to the north of the Village of Happisburgh was built in the 15th century and includes a tall tower. The church is active in the community, and events include a summer fete.

111. A small family run bird of prey establishment, Happisburgh Owls, offers private visits for owl experiences, and works with organisations for educational visits.

112. Happisburgh beach is also frequented by archaeology enthusiasts investigating the site for further evidence of early human activity. Archaeology at Happisburgh beach is discussed further in Chapter 28 Onshore Archaeology and Cultural Heritage.

113. Bacton Woods are publicly accessible with a dedicated carpark, and are located within the 500m study area south of Eddingthorpe Green.

114. There are no golf courses in or near Happisburgh South. However, there is one golf course approximately 0.5km west of Mundesley, 9.5km from the landfall.

115. North of the landfall:

- Bacton and Walcott provide five hotels and bed and breakfast establishments, and a caravan park. Sandy beaches, clifftop walking, St Andrews 15th century church, pubs, Bromholm Priory, an ancient forest, and a spa are also key tourist attractions here. The site selection process discussed in Chapter 4 Site Selection and Assessment of Alternatives has avoided direct impacts to these sites as landfall will occur at Happisburgh South.
- Mundesley provides a cinema, pubs, a caravan park and an outdoor gym, along with 25 hotel and bed and breakfast establishments. The surrounding area is popular with walkers.

116. South of the landfall:

- Eccles-on-Sea supports a caravan park and Eccles Church Tower.
- Sea Palling supports 22 hotel and bed and breakfast establishments, pubs, cycle hire, amusements, Waxham 16th century barn and Beach Rock leisure.

30.6.4 Onshore receptors in the vicinity of the onshore cable route and onshore project substation

117. The onshore cable route crosses a number of watercourses, paths, long distance trails and PRoW.

30.6.4.1 Water courses

118. The project is located within three main surface water catchments as described in Chapter 20 Water Resources and Flood Risk. The three main catchments shown in Figure 20.2 are:

- The River Bure catchment;
- The River Wensum catchment; and
- The River Wissey catchment.

119. The River Bure and several of its tributaries, including the King's Beck, would be crossed by the onshore cable route. The river rises near Briston, from where it flows in an easterly direction until it reaches Aylesham. From here, it continues to flow to the south east until it enters the sea at Great Yarmouth. The downstream reaches of the river include a wide range of wetland features, including Hoveton Great Broad and Marshes, Woodbastwick Fens and Marshes, Bure Marshes and the Norfolk Broads.

120. The North Walsham and Dilham Canal also forms a tributary of the River Bure, and would be crossed by the proposed onshore cable route at North Walsham. The canal commences at Antingham, from where it flows in an easterly direction towards Swafield. The canal is joined by several natural watercourses, including Fox's Beck. The watercourse then continues south-east through North Walsham, to Wayford Bridge, near Dilham, where it joins the tidal River Ant. The River Ant continues to flow in a southerly direction until it joins the River Bure at Horning.

121. The River Wensum and several of its tributaries, including the Wendling Beck and Blackwater Drain, would be crossed by the proposed onshore cable route. The river rises near Whissonsett, from where it flows north towards Fakenham before continuing in a broadly south easterly direction towards Norwich. The River Wensum is designated as a Special Area of Conservation (SAC) and Site of Special Scientific Interest (SSSI).

122. The proposed grid connection at the existing Necton National Grid substation is located within the headwaters of the River Wissey. The Wissey rises to the south of Dereham, from where it drains in a westerly direction towards Necton before eventually joining the River Great Ouse at Denver Sluice, near Downham Market.

30.6.4.2 Paths and non-motorised routes

123. The onshore elements of the project interact with footpaths, cycle paths, and bridleways 41 times. These are described in Appendix 30.1, shown in Figure 30.3 and discussed in section 30.8.2.

30.6.4.3 Long distance trails

124. The Norfolk Coast Path follows the clifftops at the landfall location. The Path runs for approximately 135km through the Norfolk Coast AONB from Hunstanton in west Norfolk round to Sea Palling on the North Norfolk coast and is split into a series of circular walks, short linear walks and long linear walks. It includes a section of the England Coast Path, and also connects with the Peddars Way, Paston Way and Weaver's Way.

125. The Weavers Way and Paston Way long distance trails cross the onshore cable route. The onshore cable route runs parallel to the Marriott's Way for several kilometres near to the town of Reepham and twice crosses it. The Wensum Way is also crossed twice. The Bure Valley Way runs from Aylsham to Hoveton but is not intersected by the onshore cable route at any point. Long distance trails are shown on Figure 30.3.

30.6.4.4 Public Rights of Way and cycle routes

126. The onshore cable route interacts with PRoWs in the following ways:

- Four times with Bridleways. Two of these will require no closure, one would require a controlled crossing, and one may need a temporary closure or diversion;
- Twice with the Coastal Path, neither of which will require a closure due to the use of HDD duct installation;
- Four time with cycle paths, none of which would require closure, diversion, or controlled crossings;
- 27 times with footpaths, 18 of which may require temporary closure or diversion and nine which would either require no closure or a temporary controlled crossing;
- seven times with long distance trails, two of which may require temporary closure, and five would either require no action or a controlled crossing; and
- Once with a restricted byway which is only partially affected.

127. These are shown on Figure 30.3 and listed in Appendix 30.1.

30.6.4.5 Open access and common land

128. Under the CRoW Act 2000, the public are not restricted to paths, but can freely walk on mapped areas of mountain, moor, heath, downland and registered common land, known as open access land.

129. There are small areas of open access land adjacent to the onshore cable route, at Bacton Wood, near Hoveton along the A140 and along the River Wensum.

30.6.4.6 Quiet lanes

130. Norfolk was the first country in Britain to introduce Quiet Lanes[5]. These are country lanes where motorists are encouraged to take particular care in the presence of cyclists, walkers and horse riders. These quiet country lanes occupy a triangle of North East Norfolk, from Cromer to Bacton along the coastal area, and inland to North Walsham. Covering some 36 miles they are not a continuous network, but link with many other lightly trafficked lanes, bridle ways, farm tracks and footpaths for users to create their own routes.

131. The entry and exit points of each Quiet Lane are clearly signed and no HGV routes are planned along them. The southernmost area is between North Walsham and Bacton, therefore the project does not interact with these lanes.

30.6.4.7 Dark Sky Areas

132. A Dark Sky Area is one with a low level of light pollution where the night sky can be observed for the purpose of star gazing or astronomy. The International Dark Sky Association describes the problem as: *"light pollution is the result of outdoor lighting that is not properly shielded, allowing light to be directed into the eyes and the night sky. Light that shines into the eyes is called glare and light shining into the night sky above the horizon causes sky glow. Lighting can also cause light trespass when it is directed into areas that it is not wanted."* (IDA, 2018)

133. The International Dark Sky Association officially recognises 8 Dark Sky Places in the UK, however none of these are located in Norfolk. However, the Dark Sky Discovery Partnership also lists a significant number of sites across the UK, of which three are located in Norfolk. Two are within the Norfolk Coast AONB. These are at Kelling Heath Holiday Park and Wiveton Downs which are 28km and 36km (respectively) from the landfall area. The third is near Attleborough, which is 22km south east of the onshore project substation. (Dark Sky Discovery, 2018)

30.6.5 Accommodation in Norfolk

134. An audit of 'Accommodation Stock in English Counties' shows that there are 2,137 serviced and non-serviced establishments in Norfolk County. This equates to 16,654 rooms and 47,935 bed spaces across the county (Visit Britain, 2016). A breakdown per district is provided in Table 30.15, and Table 30.16.

135. The majority of holiday accommodation is centred in and around Norwich, approximately 18km from the nearest point of the onshore cable route. These hotels

[5] http://www.norfolkcoastaonb.org.uk/mediaps/pdfuploads/pd002116.pdf

and guest houses also have the greatest number of rooms. There are over 200 hotels in Norfolk with a total of around 4,000 rooms, with prices averaging about £70 per night. Over half of the available accommodation has 10 rooms or less.

Table 30.15 Room stock in Norfolk districts by rooms

County & districts	Total serviced and non-serviced establishments	Serviced accommodation	Non-serviced accommodation ("collective accommodation establishments")			
		Hotels and similar establishments	Total non-serviced	Holiday dwellings	Tourist campsites	Other collective accommodation
Norfolk	16654	8387	8267	1722	6426	119
Norwich	2489	2399	90	28	0	62
South Norfolk	816	708	108	69	39	0
Great Yarmouth	4139	1474	2665	181	2483	1
Broadland	845	720	125	84	32	9
North Norfolk	4367	1483	2884	906	1949	29
Kings Lynn and West Norfolk	2511	1197	1314	337	959	18
Breckland	1487	406	1081	117	964	0

Table 30.16 Bed space stock in Norfolk districts by accommodation type

County & districts	Total serviced and non-serviced establishments	Serviced accommodation	Non-serviced accommodation ("collective accommodation establishments")			
		Hotels and similar establishments	Total Non-serviced	Holiday dwellings	Tourist campsites	Other collective accommodation
Norfolk	47935	18870	29065	10757	17576	732
Norwich	6073	5802	271	127	50	94
South Norfolk	2076	1627	449	366	77	6
Great Yarmouth	13166	3129	10037	3051	6970	16
Broadland	2311	1755	556	467	64	25
North Norfolk	14204	3124	11080	4257	6316	507
Kings Lynn and West Norfolk	7058	2501	4557	1901	2572	84
Breckland	3045	930	2115	588	1527	0

136. There are caravan parks and campsites at Fransham, Two Mills, Mill's Farm, North Walsham, Park Farm, Spring Meadow, Stoneybrook and Lyng. A number of serviced accommodation establishments (primarily guest houses and B&Bs) are present throughout the onshore cable route (Figures 30.2 and 30.4), including at Reepham, North Walsham, Dereham, Aylesham, Necton, Weston Park and around Swanton Morely as well as rural B&Bs and pubs in the surrounding area. Those located around Swanton Morely and Reepham are closest to the onshore cable route, with four situated within the 500m study area. An 18-room hotel is present at North Walsham. Figure 30.4 shows the distribution of serviced accommodation in Norfolk.

137. Self-catering accommodation is present at the coast, including White Cottage, The Paddocks, the Gig House and Orchard Cottage in the vicinity of the Landfall. Along the onshore cable route, self-catering accommodation is located at Boundary Stables, East Rushton Cottages, Twizzle Tree and The Old Rectory in the vicinity of the cable route. Scarning Dale, Cawston, Aylsham, and North Walsham.

138. As part of the local consultation undertaken for the project to date (section 30.3.1), local accommodation providers have been asked to sign-up to express an interest in the project and providing local accommodation to the project teams working in the area, as a means of ensuring people associated with the project are directed to invest locally where appropriate.

30.6.6 Tourist perceptions of wind farms

139. There is a perception that tourists have a negative view of the development of wind farms because they despoil natural areas. To explore this a literature review was conducted to identify trends in the perception of tourists to onshore wind farm development and in actual changes in tourist visits to areas that have experienced wind farm development, as there are no studies available on perception of onshore project substations. Although the majority of development in East Anglia is offshore, the visual impact of onshore wind farms is greater and the resultant change in tourist numbers would therefore be assumed to be greater. Any trends in available literature may indicate the potential impact of wind farm development on the tourism industry in East Anglia.

140. Studies found that between 75% (Glasgow Caledonian University, 2008) and 78% (NFO World Group, 2003) of tourists surveyed either had a neutral or positive view of wind farms. As such, between 86.7% (Aitchison, 2004) and 99% (Glasgow Caledonian University, 2008) of people said the construction of wind farms would not affect their decision to return or go to the area in the future. This includes onshore and offshore wind farms. Biggar Economics (2016) undertook a study of sites where onshore wind farms have been operational for around 10 years and

found that there was no measurable change in the performance of the tourism sector at these locations.

141. Studies also considered the size of wind farms and found no common trend. Some people preferred many smaller wind farms and some people fewer larger ones. It is assumed this is to do with locality. All surveys showed concern around cumulative impacts of continued development. (NFO World Group, 2003, Glasgow Caledonian University, 2008, and Northumbria University, 2014).

142. In conclusion, this literature review has found a consistent trend on tourist opinions and actions. These are as follows:

- All studies reviewed show that tourists are not deterred from visiting an area due to wind farms; and
- More recent studies of economic impacts show no measurable impact between tourism growth and wind farm development.

30.6.7 Anticipated Trends in Baseline Conditions

143. The baseline review of tourism and recreation in section 30.6 provides a clear indication that there are important tourism and recreational assets in the onshore and offshore project areas. The main tourism and recreation assets are protected areas of land due to their ecological importance or natural beauty. This has led to the development of a confident tourism economy where businesses supplying tourism services rely upon the attractiveness of rural and coastal areas to maintain tourism demand. Considering the emphasis that Visit Norfolk puts on the unspoilt rural and coastal character of the area, it is likely that tourism businesses will continue to rely upon natural assets for their tourism demand.

144. The majority of tourism demand is from UK visitors on day trips or short overnight trips. Demand is seasonal and weather dependent, especially for visitors that are close enough to make a day trip. Visitor surveys show that trips are made to enjoy natural assets. Therefore, it is unlikely that this seasonal relationship will change significantly.

30.6.8 Summary

145. Tourism in Norfolk supports over 61,500 jobs (17.3% of employment) and contributes £3.055 billion to the county's economy. The majority of visitors are from the UK and enjoy outdoor activities. They come to Norfolk because they are attracted by the rural location.

146. The majority of the areas that attract these types of visitors are along the coast and just inland. The most significant attractions are Norfolk Coast AONB and The Norfolk Broads National Park. The area between these is also well frequented and contains

multiple PRoW, long distance trails and cycle networks so that people can enjoy the countryside and coast line. These outdoor attractions also receive a greater proportion of local residents and can therefore be considered important recreational assets as well.

147. The tourism industry in Norfolk is generally confident about future prospects and has a substantial stock (over 200 hotels in Norfolk with a total of around 4,000 rooms) of accommodation available to facilitate it. However, as the majority of people visit for a short duration (mainly during the summer) and predominantly travel from neighbouring areas, Norfolk tourism faces competition from other coastal destinations in South East England. People also perceive that there is a limited amount to do other than outdoor activities. Therefore, the tourism industry is largely reliant on elements that could be significantly affected by the cumulative impact of infrastructure development.

148. The onshore project area crosses five long distance trails, four cycle paths, 23 PRoW footpaths, three PRoW bridleways and three restricted PRoW bridleways. The embedded mitigation developed during the site selection process for the project has resulted in designated sites, heritage assets and urban centres being avoided, thus as a result potential impacts on tourism and recreational assets are largely avoided.

149. The OWF sites are of a distance offshore to avoid effects on coastal tourism through visual impact or marine activities through physical interaction. There is potential for some interaction with coastal activities during construction along the offshore cable corridor and at the landfall, although the Norfolk coast does not have a high density of sailing clubs or other marine activity centres.

30.7 Potential Impacts

150. Based on the existing baseline environment for tourism and recreation as presented in section 30.6, this section introduces the potential impacts associated with the project, which may have the potential to affect tourism economy as discussed in section 30.4.1.1 as well as embedded mitigation in place to minimise impacts as much as possible.

30.7.1 Embedded Mitigation

151. Norfolk Vanguard Limited has committed to a number of techniques and engineering designs/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.

152. 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.

153. The following sections outline the key embedded mitigation measures relevant for this assessment. These measures are presented in Table 30.17. Where embedded mitigation measures have been developed into the design of the project with specific regard to tourism and recreation these are described in Table 30.18.

Table 30.17 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 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. 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.	The strategic approach to delivering Norfolk Vanguard and Norfolk Boreas has been a consideration from the outset.
Commitment to HVDC technology	The commitment to HVDC technology minimises environmental impacts through the following design considerations; • 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	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.

Parameter	Mitigation measures embedded into the project design	Notes
	• Reduces the number of drills needed at trenchless crossings (including landfall).	
Site Selection	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. Key design principles from the outset were followed (wherever practical) and further refined during the EIA process, including; • Avoiding proximity to residential dwellings; • Avoiding proximity to historic buildings; • Avoiding designated sites; • Minimising impacts to local residents in relation to access to services and road usage, including footpath closures; • 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.	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 siting of project infrastructure. The site selection process is set out in Chapter 4 Site Selection and Assessment of Alternatives.
Duct Installation Strategy	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	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.

Parameter	Mitigation measures embedded into the project design	Notes
	of works on any given section of the route.	
Long HDD at landfall	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.	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.
Trenchless Crossings	Commitment to trenchless crossing techniques to minimise impacts to the following specific features; • 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 of Way (PRoW); • 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.	A commitment to a number of trenchless crossings at certain sensitive locations was identified at the outset. However, Norfolk Vanguard Limited has committed to certain additional trenchless crossings as a direct response to stakeholder requests.

Table 30.18 Embedded mitigation for tourism and recreation

Parameter	Mitigation measures embedded into the project design	Notes
Commitment to no overhead lines	The commitment 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 practically no 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	

Parameter	Mitigation measures embedded into the project design	Notes
	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 link boxes.	

Site selection	Tourism and recreation receptors were considered as part of the constraints mapping process. Through constraints mapping and site selection, overlap and direct interaction with the following key sites has been avoided where practicable:
	
	• Major settlements;
	• Tourism assets including:
	  • Designated sites (including European Protected Sites, The Broads National Park, Local Nature Reserves, National Nature Reserves, The North Norfolk AONB and the Heritage Coast);
	  • Heritage assets;
	  • Caravan parks;
	  • Blue flag beaches;
	  • Places of worship; and
	  • Golf courses.	

Lighting	The onshore project substation has been designed so that it does not require permanent lighting, other than infrequent inspection and maintenance activities (during working hours only)	
Community Engagement	Community engagement is ongoing and will continue after submission of the DCO and throughout the development of the project. Stakeholders in relation to tourism and recreation that have already been engaged with include: • Local Planning Authorities; • Landowners; • Local communities; and • Business owners in the vicinity of the onshore infrastructure.	Section 30.3 details the community consultation undertaken by the project thus far.

30.7.2 Monitoring

154. The development of the detailed design and CoCP (DCO requirement 20) 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 appropriate stakeholders and included within the CoCP and the Construction Method Statement (CMS) commitments prior to construction works commencing.

30.7.3 Worst Case Scenario

155. Chapter 5 Project Description details the design parameters of the project using the Rochdale Envelope approach for the ES. This section identifies those parameters during construction, operation and decommissioning relevant to potential impacts on tourism and recreation.

156. It is anticipated that the Norfolk offshore zone will be further developed by a subsidiary of Vattenfall Wind Power Ltd to accommodate the Norfolk Boreas Offshore Wind Farm. Consideration has been made in the assessment such that the onshore cable route for Norfolk Vanguard accommodates ducts for the future Norfolk Boreas Offshore Wind Farm (with the exception of the landfall and the onshore 400kV cable route). This concept avoids reopening cable trenches, and also allows for the re-use of some shared infrastructure (such as mobilisation areas) and enabling works, thereby minimising overall impacts and disruption.

157. The worst case scenarios with regard to the tourism and recreation are presented in Table 30.20.

158. Through consultation with Norfolk County Council, it has been agreed that the tourism and recreation assessment will only consider impacts due to onshore works. As described in section 30.5 this is because it is assumed offshore workers would be housed offshore during construction and will likely access the offshore site from areas other than Norfolk. This assumption is supported by the supply chain analysis included in Chapter 31 Socio-Economics.

159. It is expected that the onshore cable route will be constructed through 2022 and 2023, with peak employment of between 250 and 420 people during the summer months of these years (Chapter 31 Socio-Economics provides indicative labour requirements throughout the onshore works). Indicative employee requirements at different parts of the cable route are as shown in Table 30.19 below.

Table 30.19 Assumed number of employees at different locations of cable route

Location	Indicative number of employees
National Grid extension	50
Vanguard substation	50
Each route section being worked for duct installation	20
Each trenchless crossing site setup and strip down	10
Each trenchless crossing during the drilling operation	5

160. As a worst case, it is assumed that works will be undertaken between February and November which is when tourism and recreation activities are likely to be highest. The maximum and minimum number of employees required is therefore a function of the assumed level of parallel working of all of the activities in Table 30.19. As a worst-case scenario for impacts on accommodation availability a peak of 420 people during peak tourist season will be used.

161. During offshore construction, there will be a requirement for a dockside marshalling facility, where components for the offshore infrastructure will be stored prior to loading onto construction barges or vessels. This facility will be chosen with regard to the location of fabricators and original equipment manufacturers (to minimise transportation requirements) and availability of suitable dockside space. At present Norfolk Vanguard Limited are in negotiations with Peel Ports about a strategic wind farm investment for an offshore operations base on the Norfolk coast[6].

162. The primary base for the operations and maintenance (O&M) facility for Norfolk Vanguard would likely be a suitable port facility on the coast of East Anglia. Options currently under consideration include ports at Hull, Great Yarmouth and Lowestoft, see section 5.4.16 in Chapter 5 Project Description, however a decision on the primary O&M base for the project has not yet been made and this could be decided post-consent. Effects due to the O&M facility have not been considered in this assessment as these will be subject to a separate consent application by residents.

Table 30.20 Worst case assumptions

Worst case assumptions Parameter	Worst case criteria	Worst case definition	Notes
Offshore wind farm sites			
Construction	Location i.e. closest point to shore	47km (closest point) from the coast	
Offshore cable corridor			
Construction	Maximum number of export cables Maximum export cable corridor length Duration Minimum safe passing distance around cable installation vessels	4 (laid as pairs in 2 trenches) 85km NV West 100km NV East Approximately 14 months 500m construction vessel safety	
Landfall			
Construction	Maximum temporary works duration Working hours Expected noise level	30 weeks 24-hour working may be required for duct installation See Chapter 25 Noise and Vibration.	

[6] Further information available at: https://corporate.vattenfall.co.uk/about-vattenfall/news-and-media/press-releases/2017/great-yarmouth-in-pole-position-for-strategic-wind-farm-investment/

Worst case assumptions Parameter	Worst case criteria	Worst case definition	Notes
	Minimum safe passing distance around cable installation vessels	500m construction vessel safety	
Onshore cable route			
Construction	Maximum onshore cable route length Maximum onshore cable route width Peak onshore construction employment Total window of ducting installation Total cable pull, joint and commissioning window Total maximum onshore construction window	60km 45m 420 personnel at any one time. 70% of workers from outside the Norfolk / Suffolk area Approximately 2 years Approximately 2 years 6 years	It is expected that during most construction works the onshore workforce will be an average of 70-90 people per week.
Permanent joint pits	Maximum number and required dimensions of permanent joint pits Access	Assumes 150 pits at 90m^2 and 2m deep per pit Periodic access to installed link boxes / test pits may be required for inspection, estimated to be annually.	Norfolk Vanguard only, spaced approximately one per circuit per 800m cable. 1 link box per circuit per 5km (24)
Onshore project substation			
Construction	Peak onshore construction employment Maximum land take for temporary works area Maximum duration of construction works	420 personnel at any one time. 100% from outside the Norfolk / Suffolk area 20,000m^2 (200m x 100m) 24 months	It is expected that during standard construction works, the onshore workforce will be an average of 70-90 people.
Operation	Maximum land take for permanent footprint area Maximum height of	75,000m^2 19m building with 25m	No illumination at night

Worst case assumptions Parameter	Worst case criteria	Worst case definition	Notes
	onshore project substation	lightning protection masts, fences 3.4m high,	
	Maximum access requirement to onshore project substation	1 visit per week, site lighting required during maintenance visits only	
	Expected noise level	See Chapter 25 Noise and Vibration.	
National Grid substation extension and National Grid overhead line modifications			
Construction	Maximum land take for temporary works area – substation extension	67,500m^2	The existing busbar would be extended in a westerly direction with seven additional Air Insulation Switchgear (AIS) bays required for Norfolk Vanguard. Indicative construction timing 24 months
	Maximum land take for temporary works area – overhead line	174,264m^2	
	Works hours and maximum duration of construction works	12 hour working day, 5 to 7 days a week, for 30 months	
	Maximum height of temporary towers	45m	
	Maximum height of perimeter fencing	4m	
Operation	Maximum land take for substation extension - permanent footprint	49,300m^2	Includes existing Necton National Grid substation area. Not normally illuminated other than infrequent inspection and maintenance activities (during working hours only). No illumination required at night.
	Maximum land take for overhead line permanent footprint	9,250m^2	
	Maximum height of new/replacement towers	55m	
	Access	1 visit per month, site lighting required during maintenance visits only	

30.7.3.1 Assessment scenarios

163. As outlined in Chapter 5 Project Description, Norfolk Vanguard Limited is currently considering constructing the project in a single phase of up to 1800MW or a two-phased approach with up to 900MW phases. Whichever scenario is selected the main elements of the onshore construction would be unchanged with the exception of cable pull, jointing, and commissioning (see Table 5.36 of Chapter 5 Project

Description). These elements require fewer staff (as shown in Chapter 31 Socio-Economics) and would therefore have lower potential for tourism and recreation impacts.

164. Construction of the project under either phased approach would be anticipated to commence between 2020 and 2021 for the onshore works, and around 2024 for the offshore works. Section 5.5.8 (Chapter 5 Project Description) outlines the indicative onshore construction programme scenarios which is summarised in Table 30. 21.

Table 30. 21 Main programme activities

Activities	Description
Pre-construction (2020 to 2021)	The pre-construction works would consider the requirements of Norfolk Boreas to minimise future disruption and would therefore cover a cable route width of up to 45m. Main activities would include: • Road Modifications; • Hedge and Tree Netting / Removal; • Ecological preparations; • Archaeological preparations; and • Pre-construction drainage.
Landfall	For a drill length of 500m, it is anticipated that site establishment, drilling of six ducts and demobilisation will take approximately 30 weeks when considering 12 hour working (7am to 7pm) and 7 day shifts. 24 hour operation may be employed for drilling activities, subject to planning and environmental restrictions, and could reduce the installation to approximately 20 weeks. Cable pulling will be undertaken subsequently to the main duct installation.
Main duct installation works (2022 to 2023)	The main duct installation works would be broadly broken into the following work packages: • Enabling works; • Duct installation and • Reinstatement works.
Workforce	It is proposed that a five day working week limited to the hours of 7am to 7pm would be employed with an average installation productivity of approximately 150m of linear cable installation per week, with a worst case of two weeks. Seven day working may be required during specific periods of the installation, such as following periods of poor weather, but would be reserved where programme acceleration is required. Seven day and 24 hour working would be employed for any trenchless crossings, subject to specific requirements.
Onshore project substation construction (2022 to 2025)	The main works for the final substation infrastructure, such as drainage, foundations and buildings would be constructed within a 24-30 month period, in parallel with the duct installation programme. Onshore project substation plant (such as transformers and switchgear) would subsequently be supplied and installed in up to two phases of 2024 and 2025 in parallel with the commissioning of the two phases of offshore wind turbine planting.

Note: see section 5.5.8 of Chapter 5 Project Description for full details

30.7.4 Assessment Scenarios

165. 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 s 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
- Total construction window for the one phase scenario is anticipated to be five years, and six years for the two phase scenario.

30.7.5 Potential Impacts during Construction

30.7.5.1 Impact 1: Increased marine construction traffic affecting attractiveness of the coastline for tourism and recreation.

166. Perception of shipping by visitors can be negative, viewed as a man-made addition to the environment. In other cases, the presence of shipping offshore can be viewed by some observers as a positive feature of interest.

167. There is the potential for temporary presence of construction vessels on passage to or from the offshore project area and loadout port to pass the North Norfolk coast and hence be visible to tourists and recreational users of the coast. Construction vessels may be travelling from Great Yarmouth, Lowestoft, or from sites outside of Norfolk. If vessels travel from Great Yarmouth, Lowestoft or ports in Suffolk and further south, they would not pass the North Norfolk Coast. If vessels travel from ports to the north, it is assumed they would be outside the visual range of tourists on the North Norfolk Coast due to the distance offshore of the OWF sites.

168. To enable long horizontal directional drilling (HDD) at the landfall (selected so as to remove the need for beach and coast path closure), there will be a requirement for vessels located approximately 200 to 300m offshore. The closest vessels to shore would be one cable laying vessel and one guard vessel at the cable pull through area for approximately one month per phase of construction. The total duration would two months in two separate one month phases spaced by a year.

169. When vessels are engaged in nearshore cable installation works, the concentration and activity of vessels close to the shore would appear at variance with the existing character and this would add to a notable effect to users of the coastal beach and path assets. The sensitivity of tourist and recreational receptors to the presence of additional offshore shipping is considered to be low and it is not anticipated to change people's use of the coast for tourism and recreation activities. These visual impacts will be transient and temporary in nature, and due to the baseline of marine activity in the area are assessed as negligible magnitude and of **negligible** significance**.**

170. Visual impacts are assessed in further detail in Chapter 29 Landscape and Visual Impact Assessment.

30.7.5.2 Impact 2: Disruption of marine recreational activities including sailing and other water sports

171. As discussed in Chapter 15 Shipping and Navigation, recreational vessel (vessels classed as 2.5 to 24m length) movements were very low during the marine traffic surveys and there are no RYA cruising routes passing through the OWF sites. Given the low number of vessels and a lack of consultation responses received on this topic to date, the area of marine construction works is considered to be of low value for marine recreation activities.

172. Chapter 15 Shipping and Navigation discusses the mitigation relevant to marine tourism and recreation activities, including the application of offshore safety zones, on-going consultation, promulgation of relevant information via Notice to Mariners and other appropriate media, and compliance with international maritime regulations.

173. Works within the offshore cable corridor will be transient and temporary in nature, and following the embedded mitigation identified in Chapter 15 Shipping and Navigation (including the continued ability to transit through the buoyed construction area and promulgation of information) any disruption or risk of collision is considered to be low magnitude, and consequently the impact assessment is assessed to be **negligible**. Full details of the Navigation Risk Assessment are provided in Appendix 15.1 to Chapter 15 Shipping and Navigation.

30.7.5.3 Impact 3: Deterioration to bathing water / Blue Flag beaches and resulting effect on tourism and recreation

174. Landfall and associated nearshore cable construction works have the potential to cause perceptions of deteriorated quality of the Blue Flag beaches, potentially leading to loss of business in these areas.

175. Visit Norfolk information shows that visitor numbers have been increasing year on year but North Norfolk District Council note that the coastal area is dependent on tourism income and that this induces further income. Furthermore, perception surveys suggest that Norfolk is primarily regarded for its beaches and countryside but that its appeal is limited.

176. There are two Designated Bathing Waters within 10km of the Happisburgh South landfall. Whilst compliance with the Bathing Waters Directive is not dependent on meeting requirements in relation to suspended solids concentrations, the presence of a plume during the bathing season is considered undesirable.

177. As discussed in more detail in Chapter 9 Marine Water and Sediment Quality, the designated bathing waters are located at least 1.38km away from the offshore cable corridor and the water body has a high capacity to accommodate change due to the high capacity for dilution and flushing, resulting in low receptor sensitivity. As a result, the impact significance is deemed to be **minor adverse**.

30.7.5.4 Impact 4: Disruption to onshore coastal tourism and recreational assets

30.7.5.4.1 Tourism receptors

178. As described in section 30.6.1, the Norfolk tourism sector has a tourism supply side consisting of businesses with high confidence in future demand (Table 30.13). Tourism demand appears to be growing (Table 30.12) mainly due to domestic day visitors (Table 30.12, Plate 30.1, and section 30.6.1.5). These visitors come to enjoy natural assets such as the North Norfolk Coast AONB and the rural character of the area.

179. The location of the landfall and onshore cable route have been designed to avoid the high value assets of the Norfolk Coast AONB and the Norfolk Broads National Park.

180. A number of hotels, self-catering cottages and camping and caravan parks are located in the vicinity of the landfall at Happisburgh South, and along the cable route. These establishments enjoy regular bookings throughout the year (Plate 30.1), which can accommodate tourists in the area who may in turn utilise local pubs, restaurants, cafes and at local tourist attractions. Following Table 30.5 these establishments would be considered low value individually but as communities or clusters of assets are considered to be of medium value.

181. Tourism communities correlate with populated areas located around landfall and along the onshore cable route. The route selection has been designed to avoid the location of such communities. A number of individual assets are located south of the landfall, accessed by Cart Gap Road, these are Smallsticks Café (approximately 670m away), Sussex Crafts (approximately 420m away) and the RNLI Lifeboat Station (approximately 600m away). The Happisburgh Lighthouse is located approximately

60m north of the landfall area, with pubs and cafes located more widely in Happisburgh. Potential impacts on Happisburgh Lighthouse are also considered within Chapter 28 Onshore Archaeology and Cultural Heritage and Chapter 29 Landscape and Visual Impact Assessment.

30.7.5.4.2 Recreational receptors

182. The beach is used for local recreational purposes. It is assumed that access to both the beach and coastal path is an important element of local resident's quality of life. Following criteria in Table 30.5, as a national asset, the Norfolk Coast Path is considered to have high sensitivity and the beach is considered to be of medium value and sensitivity.

30.7.5.4.3 Impact pathways and mitigation

183. Potential sources of disturbance to the tourism and recreation receptors during construction are:

- Traffic (both congestion and noise) (discussed further in Section 30.7.5.9);
- Temporary obstruction of assets or diversion of PRoWs due to construction (however, direct impacts to the Norfolk Coast Path will be avoided through the use of HDD at landfall); and
- Potential temporary indirect construction impacts due to noise, vibration, dust, and visual impacts.

184. Noise impacts are discussed in detail in Section 25.8 of Chapter 25 Noise and Vibration. These show a resultant **no impact** at landfall (with appropriate mitigation measures in place).

185. Dust impacts are discussed in Chapter 26 Air Quality and impacts to human receptors within 350m of construction activities are assessed to be not significant following implementation of the mitigation as outlined in the chapter.

186. Impacts on landscape are discussed in Impact 5 and detailed in Chapter 29 Landscape and Visual Impact Assessment. At landfall these are not considered to be significant.

187. Therefore, the remaining potential pathway is due to traffic congestion as discussed in Impact 9.

30.7.5.4.4 Impact significance

188. At landfall, long HDD has been selected to avoid the need for closures of the coastal path and the beach at Happisburgh. Therefore, there will be **no direct impact** on recreational assets.

189. The drilling duration for the installation of ducts at the landfall under the worst case assumptions is 3 months, with a 50x60m temporary site compound in place for 6

months. This assumption does not include 24 hour working which would reduce total duration to 5 months. Installation of the ducts will be undertaken in one phase and cable pull through would be undertaken in one or two phases. However, with appropriate mitigation measures in place, there are no noise and vibration impacts anticipated as a result of these works (see Chapter 25 Noise and Vibration).

190. Due to the presence of a temporary works site at landfall there is anticipated to be temporary disruption of low magnitude to the recreation assets in the immediate vicinity of the landfall due to traffic and visual disruption. The impacts are localised, short term and reversible. The resultant impact on recreation receptors is **minor adverse** because the sensitivity/value of the recreational receptors are medium and the magnitude of effect is low as per Table 30.9.

191. Due to temporary disturbance during construction activities, the establishments closest to landfall may suffer a temporary reduction in bookings, with consequences to surrounding businesses reliant on the trade they bring. The resultant impact on tourism receptors is **minor adverse** because the sensitivity/value of the recreational receptors are medium and the magnitude of effect is low as per the matrix tables in Table 30.9.

192. Ongoing consultation will be continued with the North Norfolk Council and key tourism asset owners around the landfall location post-consent to ensure that all management plans put in place are acceptable and sufficient to help mitigate any potential impacts throughout the construction phase.

193. A Construction Liaison Committee will be established to support with consultation with local businesses with the aim to identify potential opportunities associated with the construction of the project and to ensure construction related disturbance or access constraints to tourist and recreation facilities (e.g. local accommodation providers, pubs, coffee shops, the lighthouse and RNLI lifeboat station) are kept to a minimum.

194. As detailed in Chapter 24 Traffic and Transport, traffic management plans would be prepared prior to construction activities commencing. A Traffic Management Plan (TMP) (DCO requirement 21) would be agreed with the relevant Local Planning Authorities to minimise disturbance to local communities and tourists, and to avoid serious disruption and indirect impact upon tourism and recreational receptors.

195. An Outline Code of Construction Practice (OCoCP) (document reference 8.1) has been prepared and agreed in consultation with all relevant stakeholders and submitted alongside the ES and DCO application. This details methodologies to be used during onshore construction activities, including all requirements for provision

of alternative routes of linear recreation routes including long distance trails, cycle routes, PRoW and local footpath networks.

196. As detailed in Chapter 29 Landscape and Visual Impact Assessment, a draft Outline Landscape and Environmental Management Strategy (OLEMS) (Document reference 8.7) has been submitted alongside the ES. This document includes mitigation measures proposed for ecology and how they would fit into the wider approach to managing potential landscape impacts during construction and operation of the project. This strategic approach to the management of ecology and landscape will ensure that adverse impacts to nature- and wildlife-related tourism activities are minimised.

197. The TMP, CoCP and OLEMS will be developed in association with the Local Planning Authority and through continued engagement with the tourism asset owners to ensure their operations can continue during the construction period. Therefore, with the above mitigation measures in place, it is anticipated that the impact to tourism assets will be reduced to **negligible**.

30.7.5.5 Impact 5: Visual impacts of construction activity to tourism and recreational receptors

198. The highest density of tourism and recreation receptors is likely to be in the vicinity of the landfall and the coastal hinterlands. Due to embedded mitigation of the project including using Long HDD and the selection of HVDC technology, the potential visual impacts to these receptors have largely been removed. There remains a localised and temporary visual impact due to the temporary work site but this as this is temporary and reversible it has low magnitude of effect on tourism and recreation receptors.

199. The duct installation process is sequential so impacts are temporary, localised, and reversible. Therefore, the magnitude is also low.

200. The main potential for visual impacts is at the onshore project substation however the density and thus sensitivity of tourism and recreation assets at this point is low. These are discussed in detail in Chapter 29 Landscape and Visual Assessment.

201. Impacts to heritage sites are assessed in Chapter 28 Onshore Archaeology and Cultural Heritage.

202. The resultant impact on recreation receptors is **minor adverse** because the sensitivity/value of the recreational receptors are medium (as described in Impact 4) and the magnitude of effect is low as per Table 30.9.

30.7.5.6 Impact 6: Reduction of tourist accommodation availability due to non-resident work force

30.7.5.6.1 Accommodation receptors

203. As discussed in section 30.6.1.1, it is considered that a disruption to overnight visitors would lead to a subsequent impact on the tourism supply economy. The largest proportion of overnight stays are in serviced accommodation and it is also assumed that the majority of transient workers would stay in serviced accommodation for convenience. Therefore, serviced accommodation has been used an indicator for this impact assessment.

204. As described in Table 30.15 and Table 30.16, there are 1,483 rooms and 3,124 bed spaces across in North Norfolk. This increases to 8,387 rooms and 18,870 beds when considering hotels across the whole of Norfolk.

205. An increase in demand of this accommodation by the potentially non-resident workforce may be welcome by some hotel owners due to the extra guaranteed business, however it is likely to lead to some displacement of tourists in peak summer time when hotel occupancy rates are around 80% (Visit Britain, 2016), with secondary impacts to other local businesses where those tourists would be spending money. Therefore, their sensitivity has been scored as medium.

30.7.5.6.2 Impact pathway

206. To assess this impact, it has been assumed that the worst case scenario for peak construction personnel will occur (70% of 420 personnel) providing an increase of 294 people (as discussed in Chapter 31 Socio-economics). The main potential impacts as a result of non-resident workers (i.e. those from outside the Norfolk/Suffolk area) for the project will be to accommodation availability in Norfolk and indirect economic impacts to local businesses.

207. During peak tourism seasons (in the months of March and June to September), there will be a greater demand on accommodation from tourists. A large number of construction workers could result in less availability of hotels and other accommodation along the cable route and other onshore infrastructure to tourists.

30.7.5.6.3 Impact significance

208. As shown in Table 30.22, peak construction could increase demand for bed spaces in North Norfolk by up to 9.4%. Assuming that the majority of the workforce will require their own room (some may share twin rooms for short stays) then demand for rooms could increase by up to 20%. Considering that businesses report strong confidence in their businesses and long-term bookings it is assumed that the

magnitude of an effect on North Norfolk during high season would be medium but could be accommodated with appropriate engagement with hotel owners.

Table 30.22 Showing potential for increased peak demand on accommodation

Area	Rooms	Bed spaces	Peak Demand	Increase rooms	Increase bed spaces
North Norfolk	1,483	3,124	294	20%	9.4%
Norfolk	8,387	18,870	294	3.5%	1.6%

209. It is expected that non-resident workers would be prepared to travel up to 45 minutes to reach site. Therefore, the stock of bed spaces in Norfolk that could be included increases to 18,870 and the demand created by non-resident workers reduces 1.6% on bed spaces and 3.5% on rooms across a much wider area. Considering that peak hotel occupancy rates are 80% the magnitude of effect would be negligible.

210. As defined in Table 30.5, hotels are individually low value. Following the matrix set out in Table 30.9, the resultant impact on accommodation receptors in North Norfolk would be minor adverse because the magnitude would be medium. However, assuming that workers stay at hotels across Norfolk then the significance of the impact would be **negligible** because the magnitude of effect across all hotels in Norfolk is negligible.

211. This outcome could be assured by engaging larger hotel companies in urban areas such as Norwich or Great Yarmouth. However, it would remove the potential for positively benefiting local businesses (such as bringing out of season business to local accommodation suppliers) and could be detrimental to local support of the project. A Construction Liaison Committee (section 3.7.1) will be established and consultation with local businesses will determine if the creation of an accommodation plan i.e. to avoid major resorts and areas of high holiday-maker demand would be favourable and could be implemented to reduce displacement.

30.7.5.7 Impact 7: Obstruction or disturbance to inland tourism and recreation assets

212. Impacts to tourism and recreation assets at the coast from landfall activities are discussed in Impact 4 above. Impacts to paths and non-motorised routes are discussed in Impact 8 below.

213. Potential impacts on inshore assets could arise from the physical presence of construction works or disturbance impacts from noise or lighting. The site selection process discussed in section 30.6.4 has resulted in the onshore cable route, onshore project substation and National Grid extension works being located away from key tourism assets. The closest tourism asset along the onshore cable route is Gressenhall Farm near Dereham which is over 1km away and thus will not be affected by visual or noise impacts.

214. Outside of The Norfolk Coast AONB, the countryside of North Norfolk and Breckland is not regarded as a direct draw for tourism although it is well regarded by local recreational users and an intrinsic aspect of the visitor's experience. The Broads, primarily in Broadland, are a significant inland tourism asset however they are located far enough to the south that they will not be directly affected by the construction works.

215. Tourism assets in the vicinity of the onshore works are considered to be of medium sensitivity, of regional value. Due to the low number of tourist assets in the vicinity of onshore works the magnitude of effect to tourism assets is assessed to be low. Therefore, the significance of impact is **minor adverse** and should be monitored to ensure it remains as such, in line with other chapters that describe receptor pathways such as water contamination, visual and noise impacts through adherence to the Code of Construction Practice.

30.7.5.8 Impact 8: Obstruction or disturbance to users of PRoW, paths and non-motorised routes

30.7.5.8.1 PRoW receptors

216. The onshore elements of the project interact with footpaths, cycle paths, and bridleways 45 times, as discussed in section 30.6.4. These are described in Appendix 30.1 and Figure 30.3. The majority of these are PRoWs and three Bridleways are considered to have medium local value. Table 30.23 shows all high value PRoWs and cycleways interacted with by the project. For narrative simplicity all footpaths, cycle ways, and bridleways will be referred to as PRoWs under this impact assessment and assigned appropriate levels of value.

30.7.5.8.2 Impact pathways

217. The use of Long HDD at landfall will result in duct installation without the need to close either the Norfolk Coastal Path or the beach at Happisburgh.

218. The installation of ducts (as described in Chapter 5 and section 30.7.1) will be carried out by several teams working in parallel, with each team tackling a defined section of the onshore cable route. Starting from one of the mobilisation areas, the team will work its way along the route one workfront at a time. Workfronts are expected to be roughly 150m in length, and each workfront will take approximately one week to complete. Once a workfront has been completed, the cable route will be re-instated, however the running track will need to be maintained throughout onshore construction to allow access from the mobilisation area to the workfront.

219. There are no PRoW or cycle routes at the project substation therefore **no impact** is predicted in this area

220. As the construction would be undertaken in a sequential manner the majority of paths could be kept open with appropriate safety precautions, such as fencing to separate the public from the works site. It is anticipated that where the workfront crosses a route then the route could be diverted where possible and, in the worst case, closed for a maximum of one week. There would be no permanent closures of paths or non-motorised routes. Closures would therefore be temporary. Reinstatement of footpaths will be undertaken following the construction works, in agreement all relevant stakeholders with agreed mitigation for landscape and ecology receptors.

221. Once the workfront has been completed, it is proposed to maintain the ongoing use of the PRoW by the public by the use of banksmen to ensure temporary cessation of running track laying works and safe passage of users. Once the running track is installed across the PRoW, further management measures (i.e. signage) would ensure that running track users are aware of the potential for PRoW users to cross their path, and PRoW users are aware of the hazards to allow both to operate together safely. Precise details for management of PRoW to remain available during works will be agreed with the relevant Highway Authority prior to commencement of the relevant stage of works.

222. In the case of PRoWs that run parallel to the cable route at discreet sections, safe access to the routes will be maintained along the side of the workfront with safety fencing between the works area and the pedestrian route. Subject to agreement between Norfolk County Council and Norfolk Vanguard Limited that only where a running track or upgraded access track is formed from an existing PRoW would there need to be provision of an alternative route.

223. A pre- and post-construction survey (including identification of surface condition and street furniture) of the PRoW affected will be undertaken. PRoW surveys will be undertaken by an experienced surveyor with scope of coverage and methodology to be agreed with the relevant Highways Authority. A qualified liaison officer will be employed to ensure that information on existing land conditions is obtained, recorded and verified during the rights of way surveys.

224. Where impacted by the works, the surveyed PRoW will be restored to its original condition or otherwise as agreed with the relevant Highways Authority. The liaison officer will act as the point of contact for the restoration of the PRoW.

225. The CoCP would be prepared and agreed in consultation with all relevant stakeholders. This would detail methodologies to be used during construction activities, including all requirements for alternative routes of linear recreation routes including long distance trails, cycle routes, PRoW and local footpath networks, sign

posting and dissemination of information to the public to minimise all possible impacts to an acceptable level.

226. The majority of the effects would therefore relate to the construction works and be short to medium term with visual effects mitigated through reinstatement of the land and hedgerows. Residual impacts would occur where hedges and trees would have been removed and could not be replaced owing to restrictions over cable easements. These effects would be long term but not irreversible as replanting of hedges and trees could take place following decommissioning. Full details of landscape mitigation are discussed in Chapter 29 Landscape and Visual Impact Assessment.

30.7.5.8.3 Impact significance

227. 45 medium value PRoWs are interacted, which include the PRoWs and cycleways outlined in Table 30.23. The magnitude of effect is assessed as low because only 20 of these interactions have the possibility of requiring a temporary closure, as defined in Table 30.8, and therefore the impact significance on the majority of PRoWs is assessed as **minor adverse** on average as defined in Table 30.9.

Table 30.23 High value footpaths and cycleways interacted with by the project

PRoW	Interaction	Value	Impact magnitude	Significance
Norfolk Coastal Path	Crossed at Sea Palling to Weybourne using trenchless crossing	High	No impact	**Negligible**
Paston Way, Long Distance Walking Route	Crossed once by trenchless crossing	High	No impact	**Negligible**
Weaver's Way, Long Distance Walking Route	Temporary closure for approximately one week and then controlled crossing	High	Low	**Moderate**
Marriott's Way, Long Distance Walking Route	Trenchless crossing as part of designated area	High	No impact	**Negligible**
National Cycle Route 33	Crossed once but it assumed no closure will be required	High	No impact	**Negligible**
Wensum Way Long Distance Walking Route	Interacts with construction access which would require controlled crossing	High	Negligible	**Minor adverse**
Regional Cycle Route 33	Crossed twice but it assumed no closure will be required	High	No Impact	**Negligible**
National Cycle Route 13	Crossed once but it assumed no closure will be required	High	No Impact	**Negligible**

228. High value PRoWs outlined in Table 30.23 are assessed as high value as defined in Table 30.7. The magnitude of effect is assessed as having no impact for most, negligible for one and low impact for one, as defined in Table 30.8, and therefore the significance on these PRoWs would be mostly **negligible** with one **moderate adverse** as described in Table 30.9.

229. Norfolk Vanguard Limited is committed to working with Norfolk County Council to ensure that these impacts are temporary. An Outline Code of Construction Practice (OCoCP) (document reference 8.1) and PRoW Strategy (document reference 8.4) have been produced submitted alongside the DCO application. This details methodologies to be used during onshore construction activities, including all requirements for provision of alternative routes of linear recreation routes including long distance trails, cycle routes, PRoW and local footpath networks.

230. Therefore, the residual impact is expected to be **negligible** because only one high value PRoWs has the possibility of being closed. It is assumed that close working with Norfolk County Council, and clear communication to the public would mitigate adverse effects on this single high value PRoW.

231. The installation of the cable within the ducts will require cable pulling activities undertaken at jointing bays located along the cable route. The locations of the jointing bays are yet to be determined but will be chosen based on site selection to avoid sensitive features, including the presence of paths and non-motorised routes, wherever possible and engineering considerations. Impacts during cable pulling activities are therefore anticipated to be **negligible**, depending on the location of jointing pits and access requirements.

30.7.5.9 Impact 9: Traffic increase

30.7.5.9.1 Receptors

232. Chapter 24 Traffic and Transport follows Guidelines for the Environmental Assessment of Road Traffic (GEART). This considers Severance and Pedestrian Amenity as the receptors of increased traffic volume.

233. Severance is the perceived division that can occur within a community when it becomes separated by a major traffic artery. The term is used to describe a complex series of factors that separate people from both places and other people. Severance may result from the difficulty of crossing a heavily trafficked road or a physical barrier created by the road itself. It can also relate to relatively minor traffic flows if they impede pedestrian access to essential facilities. Severance effects could equally be applied to residents, motorists, cyclists or pedestrians.

234. Pedestrian amenity is broadly defined as the relative pleasantness of a journey and is considered to be affected by traffic flow, traffic composition and pavement width and separation from traffic. The definition of amenity also takes into consideration pedestrian fear and intimidation, consideration of the exposure to noise and air pollution, and the overall relationship between pedestrians and traffic.

235. It follows that if the impact on Pedestrian Amenity is high then it is likely that footfall to tourism assets would reduce.

30.7.5.9.2 Impact pathway

236. Chapter 24 Traffic and Transport considers 65 routes of varying sensitivity and Appendix 24.2 provides a Sensitivity Rationale. The sensitivity of a road (link) can be defined by the type of user groups who may use it. A sensitive area may for example be a village environment or where pedestrian or cyclist activity may be high, for example where there is a high tourist footfall.

237. With regards severance of communities, the traffic and transport assessment notes the peak daily change in total traffic flow for all screened roads is less than the 30% change in total traffic threshold. Therefore, the magnitude of effect is assessed as very low or low to high sensitivity roads giving impact significance on all roads of **negligible** to **minor adverse.**

238. With regards Pedestrian Amenity the transport and traffic assessment shows moderate to high adverse impacts for the roads shown in Table 30.24.

Table 30.24 Areas with moderate to major adverse impact due to traffic increase (taken from Chapter 24 Traffic and Transport)

Link number	Description	Location	Traffic Impact	Residual Impact	Density of tourism assets	Impact significance
15	B1145	Litcham to Billingford	Major Adverse	Negligible	Low	**Negligible**
17	B1145		Moderate Adverse	Minor adverse	Low	**Minor adverse**
21	B1147	Etling Green	Moderate adverse	Minor adverse	Low	**Minor adverse**
22	B1147	Dereham Road	Moderate adverse	Minor adverse	Low	**Minor adverse**
34	B1145	West of Cawston	Moderate Adverse	Minor adverse	Low	**Minor adverse**
35a	B1159	Stalham to Bacton	Moderate adverse	Minor adverse	Medium	**Minor adverse**
35b	B1159		Moderate adverse	Minor adverse	Medium	**Minor adverse**
36	B1149 - Holt Road	Norwich to east of Cawston	Moderate adverse	Minor adverse	Low	**Minor adverse**
42	B1145 – Reepham Road	West of Reepham	Major adverse	Minor adverse	Medium	**Minor adverse**
41	B1436 - Felbrigg	South of Cromer within Felbrigg Estate	Moderate adverse	Minor	High	**Moderate adverse**
61	B1436 - Thorpe Market Road		Moderate adverse	Negligible	High	**Minor adverse**
35	B1159 - Brumstead to Walcott	From Stalham to Walcott and	Moderate adverse	Minor	Medium	**Minor adverse**
47	North Walsham		Major	Minor	Medium	**Minor**

Link number	Description	Location	Traffic Impact	Residual Impact	Density of tourism assets	Impact significance
	Road - Edingthorpe Green	around to North Walsham	adverse			**adverse**
49	B1159 - Brumstead to Walcott		Major adverse	Minor	Medium	**Minor adverse**
69	Little London Road	East of North Walsham	Major adverse	Moderate adverse	Low	**Minor adverse**
71	Vicarage Road / Whimpwell Street	South west of Happisburgh	Moderate adverse	Minor adverse	Medium	**Moderate adverse**
72	Dereham Road / Longham Road - Dillington	North west of Dereham	Moderate adverse	Minor adverse	Low	**Minor adverse**

30.7.5.9.3 Significance

239. Based on the assessment in Table 30.1 and that the cable route will be constructed sequentially, without mitigation it is possible that temporary delays on the road network around Happisburgh and Cromer may be experienced. Due to the medium to high density of tourist assets in this area it has the potential to temporarily impact on the tourism industry.

240. However, Chapter 24 Traffic and Transport also proposes mitigation measures for moderate and major adverse traffic impacts. These would include a Traffic Management Plan (TMP) (DCO requirement 21) and an Access Management Plan (AMP) (DCO requirement 22). These will be agreed with Local Planning Authorities to reduce the impact to an acceptable level. Assessments on traffic and access can be found in Chapter 24 Traffic and Transport.

241. Traffic management measures would be implemented (See Chapter 24 Traffic and Transport for details) to ensure tourists and the local communities can still access the coast and other key tourism locations including Bacton Woods. Tourism assets around Happisburgh are considered to be of medium sensitivity to disruptions such as noise, visual impacts and reduced access.

242. The TMP and AMP would be agreed with Local Planning Authorities to reduce the impact to an acceptable level. The use of a running track will also reduce the number of construction vehicles on existing country roads. Further information can be found in Chapter 24 Traffic and Transport.

243. If these mitigation measures are implemented then the potential impact for tourist assets is expected to reduce to **minor adverse**. With the exception of the B1436 passing south of Cromer and Whimpwell Street south west of Happisburgh that may experience moderate impacts due to temporary traffic delays during construction.

30.7.5.10 Impact 10: Disruption or impacts to open access or public land

30.7.5.10.1 Onshore cable route

244. Several small areas of open access land or common land have been identified adjacent to the onshore cable route (e.g. Bacton Wood, near Hoveton along the A140, along the River Wensum, Blickling Hall and Abel Heath) and adjacent to the landfall (Natural England, 2017; National Trust, 2017). These areas lie outwith the onshore cable route, therefore access to this area would not be restricted.

30.7.5.10.2 Landfall and onshore project substation

245. No areas of open access or common land have been identified at the landfall or substation sites.

30.7.5.10.3 Impact significance

246. Due to the absence of open or common land in the footprint of the project, **no impact** is predicted.

30.7.6 Potential Impacts during Operation

30.7.6.1 Impact 1: Obstruction or disturbance to marine recreation

247. Due to the location of the OWF sites 47km offshore it is unlikely that recreational angling, diving or the majority of sailing in the region will be affected during operation activities. There is only one marina that would serve this sector at Lowestoft. There are no known dive sites within the OWF sites and no scheduled boat trips cover this area of sea.

248. Cables would be buried where possible but cable protection would be required (e.g. at cable and pipeline crossings and potentially at the HDD exit locations). The Maritime and Coastguard Agency (MCA) requires that where cable protection is required the water depth will not decrease by more than 5%. This will ensure keel clearance and reduce the risk of anchor snagging (see Chapter 15 Shipping and Navigation) to ensure there are no safety implications. Full details of impacts to navigation can be found in Chapter 15 Shipping and Navigation.

249. As with the construction phase, given the very low numbers of recreational vessels in the offshore project area and the embedded mitigation (e.g. promulgation of information), displacement of recreational vessels from the offshore project area would have no perceptible effects. Therefore, the magnitude of effect is assessed to be negligible, and the significance is **negligible**.

30.7.6.2 Impact 2: Visual and noise impacts on land-based tourism and recreation assets

250. There are no operation or maintenance requirements for the buried landfall cable and therefore there will be no impact on coastal tourism and recreation receptors at Happisburgh.

251. As the onshore cables will be buried underground, impacts will be restricted to times of routine or ad hoc inspection and maintenance at the transition pits, junction pits and along the onshore cable route. Routine and ad hoc maintenance activities are not anticipated to require disruption to or closure of any paths or non-motorised routes and will not interfere with local recreation activities such as walking or cycling. As such it is considered that the magnitude of effect will be negligible and given the largely rural setting away from tourism and recreation receptors, the sensitivity will be low. Therefore, for the landfall and along the onshore cable route the impact significance is likely to be **negligible.**

252. The key impact on onshore tourism receptors will therefore be the long-term presence of the onshore project substation.

30.7.6.2.1 Potential noise impacts during operation

253. Potential operational noise impacts of substation infrastructure are assessed to be of moderate magnitude during the day and major magnitude at night. This is discussed in Chapter 25 Noise and Vibration in further detail and mitigation measures are discussed which would reduce this impact to an acceptable level. This would reduce the impact to low magnitude.

254. Routine maintenance of the onshore project substation (all options) would require one visit per week, involving a single vehicle and staff during daylight hours. As a consequence, disturbance from noise and landscape and visual disturbance (above general operational movements on and off site) is predicted to be of negligible magnitude and only affect receptors in the immediate vicinity of the onshore project substation.

30.7.6.2.2 Potential visual impacts during operation

255. Potential visual impacts during operation are assessed in Chapter 29 Landscape and Visual Impact as not significant for the majority of the area around the onshore project substation. This assessment summarises impacts as follows:

- 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.
- 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.

- 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.

256. Within visual impacts, potential impact of light pollution on people's enjoyment of the night sky is also assessed. There are no nationally or internationally recognised Dark Sky Areas within the study area. The only onshore infrastructure with the potential for illumination is the onshore project substation. As the onshore project substation will not be illuminated at night (this is highlighted within Section 30.7.1 Embedded mitigation) there will be **no impact** on any recreational star gazers in the vicinity.

30.7.6.2.3 Receptors

257. In the study area of the onshore project substation there is one low value (with regards Table 30.4) tourism asset (Fransham Caravan Park, as shown in Figure 30.2). No PRoWs and no recreational assets are interacted with at the onshore project substation area (as shown in Figure 30.3 and discussed in section 30.6.4 respectively). It is assessed that there will likely not be a high density of tourists in the onshore project substation region in comparison to the levels assumed in coastal areas, with the majority of high value recreational assets, such as blue flag beaches and the AONB, located near the coast. Therefore, the remaining receptors of visual impact (under tourism and recreation considerations) during operation are recreational users that live in the vicinity of the onshore project substation, such as walkers. As the onshore project substation is around 1km from the closest urban area it is assumed that there will be a low density of recreational users in this area. Therefore, these are considered to be low sensitivity with regards Table 30.6.

258. Consultation with Necton Parish Council has highlighted that there are potentially four holiday let businesses located approximately 1km away from the onshore project substation in the general direction of Necton. While the high personal value of these features is noted, according to the definitions presented in Table 30.5 and considered within the wider baseline, these features are classified as having low value.

30.7.6.2.4 Impact significance

259. Potential impacts due to light pollution are assessed to have no impact as the onshore project substation will not be illuminated at night.

260. Chapter 25 Noise and Vibration sets out the mitigation to ensure there are no significant noise impacts from the onshore project substation effecting local recreation receptors. With regards to Table 30.6 and Table 30.7, local receptors are considered to be low impact. The receptors are also assessed to be low sensitivity (see Table 30.4 and Table 30.6) due to low density. Therefore, using the matrix in Table 30.8, the potential impacts for the majority of the area are assessed to be **minor adverse**. Norfolk Vanguard's approach for the assessment of potential impacts from noise and vibration and any necessary mitigation has been agreed with Breckland County Council. Full details of this are included in Chapter 25 Noise and Vibration.

261. Visual impacts due to the change in landscape are assessed to be not significant in the Chapter 29 Landscape and Visual Impact Assessment and therefore assessed as low adverse magnitude with regards tourism and recreation receptors. The receptors in the area are assessed to be low value (see Table 30.4 and Table 30.6) due to low density. Chapter 29 Landscape and Visual Impact Assessment also notes that 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. However, there are no high value receptors here and four low value receptors highlighted by Necton Council may be indirectly affected. This would lead to very localised impacts of moderate adverse due to visual disturbance in the medium term. Therefore, using the matrix in Table 30.8, the potential impacts for the majority of the area are assessed to be **minor adverse**.

262. Chapter 29 describes the following mitigation measures that are summarised below:

- 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. Mitigation planting would mostly comprise indigenous woodland species and would be located around the onshore project substation site. This would be designed to comprise a mix of faster growing 'nurse' species and slower growing 'core' species.
- 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.

263. The culmination of these mitigations would result in a residual long-term impact of **negligible** significance.

30.7.6.3 Impact 3: Permanent closure of paths or non-motorised routes

264. Any alternative routes proposed for the construction phase would be removed and publicised via local signage and PRoW reinstated post-construction. **No impact** is therefore predicted during operation.

30.7.6.4 Impact 4: Reduction in visitor numbers due to tourist perceptions of wind farms

265. To explore tourist perceptions, a literature review is summarised in Section 30.6.6. This study aimed to identify the trends in the perception of tourists to wind farm development and in actual changes in tourist visits to areas that have experienced wind farm development.

266. The literature review found that tourists are not deterred from visiting an area due to wind farms. More recent studies of economic impacts show no measurable impact between tourism growth and wind farm development. Recent studies (Lilley et al. 2010 and Lutzeyer et al. 2016) do show a limited relationship between the proximity of offshore wind farms and tourist perceptions but this proximity is in terms of 5-9km with clear visual impacts. Therefore, this limited relationship excludes the Norfolk Vanguard project due to the wind farm area being located 47km from the shore and beyond the visible range of a person standing on the coast.

267. Based on the studies of tourist perceptions it is predicted that during operation Norfolk Vanguard will have **no impact** on the perceptions of visitors to Norfolk and there will, therefore, not be a reduction in tourist numbers due to this development.

30.7.7 Potential Impacts during Decommissioning

30.7.7.1 Onshore

268. This section describes the potential impacts of the decommissioning of the onshore infrastructure with regards to impacts on tourism and recreation. Further details are provided in Chapter 5 Project Description.

269. The project has an indicative design life of approximately 30 years. 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 cables would be pulled through the ducts and removed, with the ducts themselves left in situ.

270. In relation to the onshore project substation, 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 of outside electrical equipment from site located outside of the onshore project substation buildings;

- Removal of cabling from site;
- 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;
- Landscaping and reinstatement of the site (including land drainage); and
- Removal of areas of hard standing.

271. 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 or less than those during construction.

272. The decommissioning methodology would be finalised nearer to the end of the lifetime of the project so as to be in line with current guidance, policy and legislation at that point. Any such methodology would be agreed with the relevant authorities and statutory consultees at the relevant time. The decommissioning works may be subject to a separate licensing and consenting approach.

30.7.7.2 Offshore and landfall

273. Offshore decommissioning is described in Chapter 5 Project Description. Offshore decommissioning is likely to include removal of all of the wind turbine components, part of the foundations (those above seabed level), removal of some or all of the array cables, interconnector cables, and offshore export cables. Scour and cable protection would likely be left *in situ.* The process for removal of offshore infrastructure is generally the reverse of the installation process and decommissioning impacts are therefore likely to be of similar significance as during construction.

274. There would be limited and temporary vessel activity within the offshore cable corridor. Vessel activity close to the shore on the seaward side would appear at variance with the existing seascape character and this would impact on users of the coastal beach and path assets for a temporary period.

275. As an alternative to decommissioning, the owners may wish to consider re-powering the wind farm. Should the owners choose to pursue this option, this would be subject to a new application for consent.

276. As discussed in Chapter 15 Shipping and Navigation, recreational vessel movement was low during the marine traffic surveys and there are no RYA cruising routes passing through the OWF sites. Given the low vessel numbers, the continued ability to transit through the decommissioning area (excepting any safety zones) and the embedded mitigation (e.g. promulgation of information), the displacement of

recreational vessels from the proposed project has no perceptible effects and is not significant under EIA terms.

277. Full details of the navigation risk assessment are discussed in Chapter 15 Shipping and Navigation.

30.8 Cumulative Impacts

278. The assessment of cumulative impact has been undertaken as a two-stage process. Firstly, all the residual impacts from previous sections are assessed for their potential to act cumulatively with other projects. This summary assessment is set out in Table 30.25.

279. The projects identified for potential cumulative impacts with Norfolk Vanguard have been discussed during ETG meetings with stakeholders and agreed in consultation with local authorities. For onshore tourism and recreation receptors affected by Norfolk Vanguard, key cumulative interactions may occur with other onshore infrastructure (e.g. onshore cable routes) in the vicinity of the Norfolk Vanguard, i.e. Norfolk Boreas, Dudgeon and Hornsea Project Three Offshore Wind Farms.

280. For offshore tourism and recreation receptors affected by Norfolk Vanguard, key cumulative interactions may occur coastally i.e. with Norfolk Boreas landfall and offshore cable installation works and projects at Bacton (i.e. terminal extension and coastal defences).

Table 30.25 Potential cumulative impacts

Impact	Potential for cumulative impact	Rationale
Construction		
Increased marine construction traffic affecting attractiveness of the coastline for Tourism and recreation.	Yes	Although the project is located far enough offshore that it will not be visible from shore, there are other wind farms in the region that are visible. The short-term temporary offshore cable laying activities for Norfolk Vanguard will also be visible from shore. This may create a perception in tourists that the coastline is despoiled although research shows that tourists have a generally positive view of wind farms, as detailed in section 30.6.6..
Disruption of marine recreational activities including sailing and other water sports	Yes	As discussed in Chapter 15 Shipping and Navigation, there is potential for cumulative impacts with other offshore wind farms in the southern North Sea with regards to vessel routing / displacement, increased vessel to vessel collision risk and increased vessel to structure collision risk and diminished emergency response time.
Deterioration to Bathing Water / Blue Flag beaches and resulting effect on Tourism and Recreation	Yes	As with visual impacts, although the project will not have a direct impact on Blue Flag beaches, the perception of tourists due to other developments (such as the Bacton Gas Terminal sandscaping and Norfolk Boreas offshore wind

Impact	Potential for cumulative impact	Rationale
		farm) may create the perception that the area is becoming over developed; although research shows that tourists have a generally positive view of wind farm development, as detailed in section 30.6.6..
Disruption to onshore coastal recreational and tourism assets	Yes	Depending on the timing of the works with regards the Bacton Gas Terminal and landfall works associated with Norfolk Vanguard and Norfolk Boreas there may be cumulative disruption to recreational marine users.
Visual impacts of construction activity	Yes	Depending on the timings of the works for Hornsea 3, there may be cumulative impacts during construction works associated with the cable route of for Norfolk Vanguard. There will be cumulative impacts due to the onshore project substation for Norfolk Boreas although these have been minimised by Norfolk Vanguard undertaking the preparatory works along the rest of the cable route.
Reduction of tourist accommodation availability due to non-resident work force	Yes	Depending on timing of works with respect other large infrastructure projects there may be an accumulation of non-resident workers residing within Norfolk during high season months.
Obstruction or disturbance to inland tourism and recreation assets	Yes	This will depend on the phasing of works with respect other projects with the potential for interaction.
Obstruction or disturbance to users of paths or non-motorised routes	Yes	This will depend on the phasing of works with respect other projects with the potential for interaction; cumulative impacts may occur with the onshore cable routes of other offshore wind farms (Norfolk Boreas, Hornsea Three and Dudgeon) in the surrounding area.
Traffic increase	Yes	This will depend on the phasing of works with respect to Hornsea Project Three and coastal works at Bacton.
Operation		
Obstruction or disturbance to marine recreation	No	Once constructed, it is assumed that impacts will be negligible so ongoing obstruction of marine recreation is unlikely for recreation vessels.
Visual and noise impacts on land-based tourism and recreation assets	No	Once constructed, it is assumed that these impacts will be negligible so ongoing obstruction of recreation is unlikely. However, if not managed properly, the perception of the value visitors have for rural Norfolk tourism may reduce which may lead to a reduction in tourist numbers.
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 the same as those identified during the construction stage.		

281. The second stage of the CIA is an assessment of whether there is spatial or temporal overlap between the extent of potential effects of the onshore infrastructure and the potential effects of other projects scoped into the CIA upon the same receptors. To identify whether this may occur, the potential nature and extent of effects arising from all projects scoped into the CIA have been identified and any overlaps between these and the effects identified for Norfolk Vanguard in section 30.7 have also been identified. Where there is an overlap, an assessment of the cumulative magnitude of effect is provided.

282. The projects identified for potential cumulative impacts with Norfolk Vanguard have been discussed during ETG meetings with stakeholders. The full list of projects for consideration has been updated following PEIR and agreed in consultation with local authorities.

283. Table 30.26 summarises those projects which have been scoped into the CIA due to their temporal or spatial overlap with the potential effects arising from the project. The remainder of the section details the nature of the cumulative impacts against all those receptors scoped in for cumulative assessment.

Table 30.26 Summary of projects considered for the CIA in relation to tourism and recreation

Project	Status	Development period	[7]Distance from Norfolk Vanguard onshore project area (km)	Distance from Norfolk Vanguard offshore project area (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	0 – projects are co-located	Pre-application outline only.	High	Yes	Impacts would relate to visual and noise impacts to onshore tourism and recreation assets, primarily concentrating around mobilisation areas and works at the project substation and National Grid extension. Cable landfall will be co-located for both projects and has been included in the impact assessment for this Chapter, therefore is not within the CIA. Any secondary infrastructure may have temporary noise/vibration impacts and long term visual impacts.
Hornsea Project Three Offshore Wind Farm	Pre-Application	Expected construction date 2021	0 – cable intersects project	80	Full PEIR available: http://www.dongenergy.co.uk/en/Pages/PEIR-Documents.aspx	High	Yes	The Hornsea Project Three onshore cable route will cross the Norfolk Vanguard cable route. The exact location and manner of this crossing will determine the magnitude of cumulative impacts on local tourism and recreation assets. Details of this crossing will be discussed with

[7] Shortest distance between the considered project and Norfolk Vanguard – unless specified otherwise.

Project	Status	Development period	[7]Distance from Norfolk Vanguard onshore project area (km)	Distance from Norfolk Vanguard offshore project area (km)	Project definition	Project data status	Included in CIA	Rationale
								Orsted (formally DONG Energy), local stakeholders and the Local Planning Authority.
Dudgeon Offshore Wind Farm	Commissioned	Constructed	0	66	http://dudgeonoffshorewind.co.uk/	High	No	Cumulative impacts are not anticipated to occur with Dudgeon Offshore wind farm as, although the substations for both projects will be located in close proximity, there are no tourism and recreation assets which may be affected.
A47 corridor improvement programme – North Tuddenham to Easton	Pre-application	Expected construction date 2021-23	2.5	n/a onshore project	https://infrastructure.planninginspectorate.gov.uk/projects/eastern/a47-north-tuddenham-to-easton/	Medium	No	Roadworks may have a cumulative impact on Pedestrian Amenity but as the roads listed for the improvement programme are not within the area highlighted as potentially impacted by Norfolk Vanguard (Section 30.8.2 Impact 9), it is unlikely to have an effect on the tourism industry.
A47 corridor improvement programme – A47 Blofield to North Burlingham	Pre-application	Expected construction date 2021-22	25	n/a onshore project	https://infrastructure.planninginspectorate.gov.uk/projects/eastern/a47-blofield-to-north-burlingham/	Medium	No	Roadworks may have a cumulative impact on Pedestrian Amenity but as the roads listed for the improvement programme are not within the area highlighted as potentially impacted by Norfolk Vanguard (Section 30.8.2 Impact 9),

Project	Status	Development period	[7]Distance from Norfolk Vanguard onshore project area (km)	Distance from Norfolk Vanguard offshore project area (km)	Project definition	Project data status	Included in CIA	Rationale
								it is unlikely to have an effect on the tourism industry.
A47 corridor improvement programme – A47 / A11 Thickthorn	Pre-application	Expected construction date 2020-21	18	n/a onshore project	https://infrastructure.planninginspectorate.gov.uk/projects/eastern/a47a11-thickthorn-junction/	Medium	No	Roadworks may have a cumulative impact on Pedestrian Amenity but as the roads listed for the improvement programme are not within the area highlighted as potentially impacted by Norfolk Vanguard (Section 30.8.2 Impact 9), it is unlikely to have an effect on the tourism industry.
Norwich Western Link	Pre-application	2022	2.8	n/a onshore project	https://www.norfolk.gov.uk/roads-and-transport/major-projects-and-improvement-plans/norwich/norwich-western-link/timeline	Medium	No	Roadworks may have a cumulative impact on Pedestrian Amenity but as the roads listed for the improvement programme are not within the area highlighted as potentially impacted by Norfolk Vanguard (Section 30.8.2 Impact 9), it is unlikely to have an effect on the tourism industry.

Project	Status	Development period	[7]Distance from Norfolk Vanguard onshore project area (km)	Distance from Norfolk Vanguard offshore project area (km)	Project definition	Project data status	Included in CIA	Rationale
Third River Crossing (Great Yarmouth)	Pre-application	Expected to start in 2020	28	n/a onshore project	https://www.norfolk.gov.uk/roads-and-transport/major-projects-and-improvement-plans/great-yarmouth/third-river-crossing	Medium	No	Roadworks may have a cumulative impact on Pedestrian Amenity but as the bridge is not within the area highlighted as potentially impacted by Norfolk Vanguard (section 30.8.2 Impact 9), it is unlikely to have an effect on the tourism industry.
King's Lynn B Power Station amendments	Pre-application	Expected construction 2018 - 2021	28	n/a onshore project	https://www.kingslynnbccgt.co.uk/	Medium	No	Due to the distance of King's Lynn B Power Station from the project it is unlikely that cumulative effects would occur. There is the potential for increased accommodation demand but the assessment (Section 30.6.5 Accommodation in Norfolk) shows that the accommodation stock across Norfolk is substantial so any additional impact would be negligible.
NNDC								

Project	Status	Development period	[7]Distance from Norfolk Vanguard onshore project area (km)	Distance from Norfolk Vanguard offshore project area (km)	Project definition	Project data status	Included in CIA	Rationale
PF/17/1951 Erection of 43 dwellings and new access with associated landscaping, highways and external works, and amendments to substation)	Awaiting decision	Anticipated Q2 2018	0.7	n/a onshore project	Application available: https://idoxpa.north-norfolk.gov.uk/online-applications/applicationDetails.do?activeTab=summary&keyVal=_NNORF_DCAPR_92323	High	No	Low density of tourism receptors within the vicinity of the development therefore a low likelihood of cumulative impact.
Bacton Gas Terminal Extension	Approved	Approved 20/09/2016. Expires 20/09/2019.	3	n/a onshore project	Approved PDS available https://idoxpa.north-norfolk.gov.uk/online-applications/applicationDetails.do?activeTab=summary&keyVal=_NNORF_DCAPR_88689	Medium	Yes	Cumulative impacts may occur with the projects at Bacton through creation of sediment plumes or decreased water quality. This is assessed in Chapter 9. Negative perceptions of these projects may influence people's perceptions of the project and how they perceive impacts to community infrastructure. Although research shows that tourists have a generally positive view of wind farms, as

Project	Status	Development period	[7]Distance from Norfolk Vanguard onshore project area (km)	Distance from Norfolk Vanguard offshore project area (km)	Project definition	Project data status	Included in CIA	Rationale
Bacton Gas Terminal coastal protection	Approved	Approved 18/11/2016. Expires 18/11/2019	2.5	2.5	Approved PDS available	Medium	Yes	detailed in section 30.6.6.
Bacton and Walcott Coastal Management Scheme	Approved	Expected construction date 2018	1.0	n/a onshore project	Public information leaflets available: https://www.north-norfolk.gov.uk/media/3371/bacton-to-walcott-public-information-booklet-july-2017.pdf	Medium	Yes	
Breckland Council								
21-31 new dwellings in Necton (BLR/2017/0001/PIP)	Awaiting decision	Not known. Application submitted November 2017.	1.0	n/a onshore project	http://planning.breckland.gov.uk/OcellaWeb/showDocuments?reference=BLR/2017/0001/PIP&mod	Medium	No	There are two ways that housing developments could cumulatively effect tourists: • Through disturbance due to noise, vibration, or dust;

Project	Status	Development period	[7]Distance from Norfolk Vanguard onshore project area (km)	Distance from Norfolk Vanguard offshore project area (km)	Project definition	Project data status	Included in CIA	Rationale
					ule=pl			and • Through traffic delays. Although these developments are within Necton they are far enough from the onshore project substation area for cumulative noise impacts to not be an issue to community infrastructure receptors. Increased traffic density is considered in Chapter 24 Transport and Traffic. It is not possible to determine if these will culminate in community impacts but it is assumed to be highly unlikely due to the low level of human health outcomes assessed in Chapter 27 Human Health.
4-8 new dwellings in Necton (BLR/2017/0002/PIP)	Awaiting decision	Not known. Application submitted November 2017.	1.0	n/a onshore project	http://planning.breckland.gov.uk/OcellaWeb/showDocuments?reference=BLR/2017/0002/PIP&module=pl	Medium	No	
70 dwellings (3PL/2016/0298/D) (Phase 2 of 3PL/2012/0576/O)	Approved (21/09/16)	Not known. Application submitted March 2016.	6.4	n/a onshore project	http://planning.breckland.gov.uk/OcellaWeb/planningDetails?reference=3PL/2016/0298/D&from=planningSearch	Medium	No	There are two ways that housing developments could cumulatively effect tourists: • Through disturbance due to noise, vibration, or dust; and • Through traffic delays.

Project	Status	Development period	[7]Distance from Norfolk Vanguard onshore project area (km)	Distance from Norfolk Vanguard offshore project area (km)	Project definition	Project data status	Included in CIA	Rationale
98 dwellings at Swans Nest with access from Brandon Road (3PL/2017/1351/F) (Phase 3 of 3PL/2012/0576/O)	Awaiting decision (due 30/03/2018)	Not known. Application submitted Jan 2016.	6.4	n/a onshore project	http://planning.breckland.gov.uk/OcellaWeb/planningDetails?reference=3PL/2017/1351/F&from=planningSearch	Medium	No	These projects are far enough from the onshore project substation area for cumulative noise impacts to not be an issue to community infrastructure receptors. Increased traffic density is considered in Chapter 24 Transport and Traffic. It is not possible to determine if these will culminate in community impacts but it is assumed to be highly unlikely due to the low level of human health outcomes assessed in Chapter 27 Human Health.
175 dwellings with access at land to west of Watton Road, Swaffham (3PL/2016/0068/O) (Swans Nest Phase B)	Awaiting decision (due 13/10/2017)	Not known. Application submitted Jan 2016.	6.4	n/a onshore project	http://planning.breckland.gov.uk/OcellaWeb/planningDetails?reference=3PL/2016/0068/O	Medium	No	

284. Norfolk Boreas Limited is developing the sister project Norfolk Boreas Offshore Wind Farm located to the north of NV East, with the DCO application following approximately a year behind the Norfolk Vanguard DCO application. The development of Norfolk Boreas will use the same offshore cable corridor as Norfolk Vanguard with the addition of a spur to the Norfolk Boreas offshore wind farm area.

285. The worst case scenario for tourism and recreation is set out in section 30.7.1 and has assumed that the duct installation along the onshore cable route for the Norfolk Boreas project will be conducted as part of the Norfolk Vanguard project construction. Therefore, the only element of Norfolk Boreas not considered in the assessment conducted in section 30.6 is the Norfolk Boreas cable pull and onshore project substation (including the National Grid substation extension, any landscaping or planting, and the onshore 400kV cable route). Potential cumulative impacts arising from these elements of the Norfolk Boreas project are considered in the CIA below, alongside all other projects set out in Table 30.26.

286. To avoid confusion between different projects, the Norfolk Vanguard, previously referred to as 'the project', is referred to as 'the Norfolk Vanguard project' within this section.

30.8.1 Cumulative impacts during Construction

30.8.1.1 Cumulative Impact 1: Increased marine construction traffic affecting attractiveness of the coastline for tourism and recreation.

287. Norfolk Vanguard and Norfolk Boreas share a landfall. There is the potential for temporary presence of construction vessels on passage to or from the construction sites and loadout ports for both the Norfolk Vanguard and Norfolk Boreas offshore wind farms to pass the North Norfolk coast and be visible to tourists and recreational users of the coast. Perception of shipping by visitors can be negative, viewed as a man-made addition to the environment. In other cases, the presence of shipping offshore can be viewed by some observers as a positive feature of interest.

288. Construction vessels may be travelling from Great Yarmouth, Lowestoft, or from sites outside of Norfolk. If they travel from Great Yarmouth, Lowestoft, ports in Suffolk or ports further south to the Norfolk Vanguard project and Norfolk Boreas project or Bacton, they would not pass the North Norfolk Coast.

289. If they travelled to Hornsea Project Three from Great Yarmouth, Lowestoft, or further south, then they may pass the North Norfolk coast. However, it is assumed that vessels would travel at a far enough distance from the coast to not be visible to tourism and recreation receptors.

290. If vessels travel from ports in the North, such as Hull, to the Norfolk Vanguard project and Norfolk Boreas project they would pass the North Norfolk coast but it is assumed they would be outside of the visual range of tourists in North Norfolk due to the distance offshore of the OWF sites. As Bacton is a coastal project there is a greater chance that ships may be within visual range of tourism and recreation receptors.

291. Construction vessels laying the offshore export cables for the Norfolk Boreas project and Norfolk Vanguard will be visible from shore. The works for the two projects will be conducted sequentially. The Norfolk Boreas project is planned for construction approximately one year after Norfolk Vanguard. Therefore, although the number of vessels potentially present on site at any time will not increase, the vessels will be cumulatively present for greater duration until works are completed for the Norfolk Boreas project.

292. The 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 to users of the coastal beach and path assets. The sensitivity of tourist and recreational receptors to the presence of additional offshore shipping is considered to be low and it is not anticipated to change people's use of the coast for tourism and recreation activities. The number of vessels present at any one time will be limited, and these visual impacts will be transient and temporary in nature, and due to the baseline of marine activity in the area are assessed as negligible magnitude and of **negligible** significance.

293. Visual impacts are assessed in more detail in Chapter 29 Landscape and Visual Impact Assessment.

30.8.1.2 Cumulative Impact 2: Disruption of marine recreational activities including sailing and other water sports

294. No impacts have been identified on cumulative displacement of recreational activity, and thus collision risks. Vessels related to the construction, operation or decommissioning of any of the cumulative projects will be managed by the marine coordinators. Full details on the CIA for recreational vessels are discussed in Chapter 15 Shipping and Navigation.

30.8.1.3 Cumulative Impact 3: Deterioration to Bathing Water / Blue Flag beaches and resulting effect on Tourism and Recreation

295. Norfolk Vanguard and Norfolk Boreas landfall works may potentially be undertaken concurrently and therefore short duration of sediment disturbance anticipated during the installation/activities reduces the potential perception impact on the bathing water (see Chapter 9 Marine Water and Sediment Quality).

296. As a result, it is considered that the cumulative impact would not increase the impact significance predicted as a result of construction of Norfolk Vanguard alone (i.e. either minor or negligible impact significance).

297. The proposed landfall at Happisburgh South and the offshore cable corridor is to the south of the proposed sand engine (large scale beach nourishment) for a coastal protection scheme in front of Bacton Gas Terminal. The effect of the beach nourishment has potential to be expressed at nearby bathing waters and blue flag beaches (i.e. some of the nourished sand will migrate from the main sand engine driven by longshore sediment transport). There is currently insufficient information available for the sandscaping scheme and so the cumulative impacts cannot be assessed at this stage.

30.8.1.4 Cumulative Impact 4: Disruption to onshore coastal tourism and recreation assets

298. A number of tourism assets are located around the landfall south of Happisburgh. The shared landfall and onshore cable route of both Norfolk Boreas and Norfolk Vanguard is designed to avoid the location of these assets (described in Section 30.8.2.4 Impact 4).

299. The local beach and Norfolk Coast Path also provide key recreation assets at the landfall. Closure of these features would be avoided by the use of long HDD to install ducts for both Norfolk Boreas and Norfolk Vanguard during construction.

300. Traffic management measures would be implemented (See Chapter 24 Traffic and Transport for details) to ensure tourists and the local communities can still access the coast and other key tourism locations.

301. Noise impacts are discussed in Chapter 25 Noise and Vibration and dust impacts are discussed in Chapter 26 Air Quality. Both are considered not to be significant for the shared infrastructure and, therefore, assessed to be low impact.

302. Cumulative impacts to tourism assets at landfall are assessed to be low impact and the sensitivity of effected receptors is assessed to be low. Following the matrix set out in Table 30.8 the cumulative impact is anticipated to be **minor adverse** significance for the duration of construction activities.

303. With regards to recreational assets, closures would not be required to the beach or Norfolk Coast Path during construction. Therefore, there would be no direct impact on receptors. The potential for noise and vibration impacts are considered in detail in Chapter 25 Noise and Vibration which states there will be no resultant noise or vibration impacts at landfall with the inclusion of appropriate mitigation measures. The presence of a temporary works area would create a visual change to the environment but this would be localised, temporary, and not significant so is unlikely

to lead to a reduction in visitor numbers or expenditure. As the landfall is shared by two projects, this reduces the cumulative construction time and the cumulative indirect impact is assessed to be negligible. Following the matrix set out in Table 30.8 the cumulative impact is anticipated to be **negligible** significance for the duration of construction activities.

304. As Norfolk Vanguard and Norfolk Boreas share a landfall, a co-ordinated approach to consultation and mitigation has been undertaken to ensure impacts to local tourism and recreation receptors are minimised. The strategy adopted by Vattenfall Wind Power Ltd for both Norfolk Vanguard and Norfolk Boreas to have co-located landfall and allow for a joint onshore cable route was deemed most appropriate from both environmental and engineering perspectives, and limits the geographical extent of the construction works. This also ensures any impacts to local tourism and recreational receptors are kept to an acceptable minimum. Consequently, a co-ordinated approach to traffic and access for both Norfolk Vanguard and Norfolk Boreas will be undertaken. Although the two projects will mean construction activities will be conducted over a longer duration, the co-location of significant works will ensure the geographical extent of construction works is constrained. Further details on the traffic related CIA are discussed in Chapter 24 Traffic and Transport.

30.8.1.5 Cumulative Impact 5: Visual impacts of construction activity to tourism and recreation assets

305. Impacts relating to visual effects are discussed in Chapter 29 Landscape and Visual Assessment. Because the works along the onshore cable route will be reinstated for Norfolk Vanguard prior to construction of Norfolk Boreas, there will be **no cumulative** impact during construction activities.

306. Impacts at the substation for Norfolk Boreas would be less than for Norfolk Vanguard. This is because the National Grid substation extension would be undertaken during the Norfolk Vanguard project to accommodate both projects, therefore the only works undertaken for the Norfolk Boreas project would be the onshore project substation. This is planned to follow approximately one year after the Norfolk Vanguard project. However, it is assumed that users of recreational assets may perceive a similar level of impact or at a slightly lower level but for a longer duration. Therefore, at the onshore project substation, the cumulative magnitude is assessed to be the same and the sensitivity of the receptors is assessed to be the same as described in section 30.8.2.6. That is assessed to be of **minor adverse** significance.

307. The Hornsea Three Project onshore cable route would cross the Norfolk Vanguard and Norfolk Boreas onshore cable routes. It has not been determined which cable

route will pass underneath the other but it is best practice for the later project to use a trenchless crossing to minimise disturbance. This will remove the need for two trenches and the associated visual impact, other than temporary sites either side of the Hornsea Project Three cable route. As the impact will be temporary the sensitivity is assessed to be low and the cumulative impact magnitude to be low. Therefore, the cumulative impact at the onshore cable route crossing is assessed to be of **negligible** significance.

308. Impacts to historic setting are discussed in Chapter 28 Onshore Archaeology and Cultural Heritage.

30.8.1.6 Cumulative Impact 6: Reduction of tourist accommodation availability due to non-resident work force

309. To assess this impact, it has been assumed that the worst case scenario for peak construction personnel will occur (70% of 420 personnel) providing an increase of 294 people. The main potential impacts as a result of non-resident workers for the project will be to accommodation availability in Norfolk and indirect economic impacts to local businesses.

310. It is anticipated that a similar number of construction personnel could be required for construction works for Hornsea Project Three as for Norfolk Vanguard, however construction personnel will be less for Norfolk Boreas, as a proportion of the site preparation and construction activities will have already been undertaken during the construction of Norfolk Vanguard.

311. Pre-construction works for Norfolk Vanguard are anticipated to commence in 2020. Onshore construction for Hornsea Project Three is anticipated to begin in 2021, whilst pre-construction works for Norfolk Boreas are programmed to commence in 2022.

312. Although unlikely, a worst case scenario for peak construction personnel is where peak demand for Norfolk Vanguard and Hornsea Project Three overlap. Demand would therefore increase as shown in Table 30.27. This would be a significant impact on availability in North Norfolk (as discussed under section 30.7.5.6).

Table 30.27 Showing potential for cumulative increased peak demand from Norfolk Vanguard and Hornsea Project Three on accommodation

Area	Rooms	Bed spaces	Peak Demand	Increase rooms	Increase bed spaces
North Norfolk	1,483	3,124	588	39.6%	18.8%
Norfolk	8,387	18,870	588	7.0%	3.1%

313. It is expected that non-resident workers would be prepared to travel up to 45 minutes to reach site. Therefore, the stock of bed spaces in Norfolk that could be

included increases to 18,870 and the demand created by non-resident workers reduces 3.1% on bed spaces and 7.0% on rooms across a much wider area. Considering that peak hotel occupancy rates are 80% the magnitude of effect would be negligible and potentially positive.

314. As defined in Table 30.5, hotels are individually low value. Following the matrix set out in Table 30.9, the resultant impact on accommodation receptors in North Norfolk would be minor adverse because the magnitude would be medium. However, assuming that workers stay at hotels across Norfolk then the significance of the impact would be **negligible** because the magnitude of effect across all hotels in Norfolk is negligible.

30.8.1.7 Cumulative Impact 7: Obstruction or disturbance to inland tourism and recreation assets

315. The onshore works required for Norfolk Vanguard and Norfolk Boreas have been designed to avoid tourism and recreation assets.

316. The site selection process undertaken for Norfolk Vanguard has located the onshore cable route and onshore infrastructure a minimum 1km from tourism and recreation assets in Norfolk. Works required for Norfolk Boreas will be conducted at the substation, and at jointing pits during the cable pull phase. The locations of jointing pits will be confirmed post-consent and will be strategically located along the onshore cable route to be suitable for engineering requirements, whilst avoiding sensitive sites and supporting suitable access for construction vehicles. There are no tourism or recreation assets which could be affected by construction of the onshore cable route at the crossing point between Norfolk Vanguard/Norfolk Boreas and Hornsea Project Three.

317. Due to the low number of tourist assets in the vicinity of onshore project area, the sensitivity of tourism assets is assessed to be low. Due to the temporary nature of any effect the impact magnitude is assessed to be low. Therefore, the significance of cumulative impact is **minor adverse.**

318. Impacts at landfall are considered in Cumulative Impact 4 above.

30.8.1.8 Cumulative Impact 8: Obstruction or disturbance to users of PRoW and other non-motorised routes

319. As Norfolk Vanguard will install the required ducts along the onshore cable route for Norfolk Boreas, a large number of potential cumulative impacts on the users (pedestrians, cyclists, horse riders) of paths or non-motorised routes have been mitigated through engineering design. Cumulative impacts between the two projects will be limited to impacts around landfall, the onshore project substation and jointing pits.

320. Hornsea Project Three anticipates impacts to Peddars Way, Norfolk Coast Path, a number of PRoWs and cycle routes including National Cycle Network Route 1 (NR1) at Attlebridge and Sustrans Regional Cycle Route 30 (RR30). All projects crossing paths or non-motorised routes would agree mitigation with the Local Planning Authority such as soft management techniques or provision alternative routes to an acceptable level, however depending on timings of the projects, there may be cumulative impacts of multiple works at the same time, thereby potentially increasing travel times. Any impacts would be short term and temporary for the duration of works at each crossing point. Assuming that Hornsea Project Three agreed a similar level of mitigation as Norfolk Vanguard, cumulatively potential impacts to paths or non-motorised routes are anticipated to remain **minor adverse** as described in section 30.8.2.10.

30.8.1.9 Cumulative Impact 9: Traffic increase

321. Cumulative traffic impacts are anticipated to occur with Norfolk Boreas and Hornsea Project Three. Norfolk Vanguard Limited and Ørsted are in regular dialogue and have been for some time. Norfolk Vanguard Limited and Ørsted will continue to work closely together, and with statutory consultees, to ensure the CIA is as accurate as it can be. If necessary, post submission Norfolk Vanguard Limited will update the CIA within its ES to take into account any new data which has been made available following the submission of the Hornsea 3 application to the Secretary of State. This approach complies with the relevant EIA Regulations and is consistent with that taken for other applications, where relevant environmental information has become available after the point of application submission.

322. The A47 corridor improvement programme is classed as a NSIP and would be required to make a DCO application. Current timescales estimate that the DCO will be submitted in summer 2018, with construction commencing in spring 2020.

323. Four of the six schemes that could potentially impact on the project include:

- North Tuddenham to Eastern dualling;
- A47 / A11 Thickthorn Junction;
- A47 Blofield to North Burlingham dualling; and
- Great Yarmouth junction enhancements.

324. The programme of construction works is due to start in 2020 and predicted to end in 2022. The works are likely to finish before the main construction works of the project, however this does not allow for slippage in the programme.

325. Norfolk Vanguard Limited has committed to continued engagement throughout pre-construction phase to ensure any impacts are understood and mitigated. Full details are discussed in Chapter 24 Traffic and Transport.

30.8.2 Cumulative Impacts during Operation

30.8.2.1 Cumulative Impact 1: Obstruction or disturbance to marine recreation

326. No impacts have been identified on cumulative displacement of recreational activity, and thus collision risks for operation. This is due to recreational vessels in the majority transiting within the wind turbine arrays and therefore avoiding the majority of potential displaced commercial traffic. Vessels related to the construction, operation or decommissioning of any of the cumulative projects will be managed by the marine coordinators. Further details are discussed in Chapter 15 Shipping and Navigation.

30.8.2.2 Cumulative Impact 2: Visual and noise impacts on land-based tourism and recreation assets

327. The results of the cumulative mitigated noise modelling (Norfolk Vanguard onshore project substation and Norfolk Boreas onshore project substation) are detailed in Chapter 25 Noise and Vibration. With the application of mitigation measures which are to be determined during the detailed design phase (in agreement with Breckland Council) predicted noise levels fall within the 32dBZ(100hz) limit and result in no impact at identified receptor locations in accordance with BS4142:2014 derived impact magnitudes. A negligible adverse impact significance has been predicted. There is potential for cumulative visual impacts with Norfolk Boreas at the onshore substation which may affect local recreation assets but there is a low density of tourism and recreational receptors at this point. Chapter 25 Noise and Vibration and Chapter 29 Landscape and Visual Impact Assessment discusses the impacts further and outline the indicative mitigation which will be further developed to ensure cumulative noise impacts are within an acceptable level. Mitigation practices will be shared between projects therefore the long term cumulative impacts are assessed to negligible as described in section 30.8.2.2. The approach to mitigation for Norfolk Vanguard and Norfolk Boreas has been discussed with local authorities through the ETG Meetings and will continue post-consent during the detailed design phase.

30.8.3 Cumulative Impacts during Decommissioning

328. Decommissioning of the 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 the same as those identified during the construction stage.

30.9 Inter-relationships

329. Table 30.28 lists out the inter-relationships between this chapter and other chapters within the ES.

Table 30.28 Tourism and recreation inter-relationships

Topic and description	Related Chapter	Where addressed in this Chapter	Rationale
Landscape and Visual Impact Assessment from marine, coastal and land based receptors	Chapter 29 Landscape and Visual Impact Assessment	Section 30.7 (all impacts)	Visual impacts of the project may affect local communities and tourists who use the area for recreation activities including walking, cycling, bird watching and, wildlife appreciation and star gazing.
Impact of tourism and recreation to socio-economics	Chapter 31 Socio-economics	Section 30.7 (all impacts)	The project may affect local businesses in the tourism and recreation industry.
Impacts to tourism and recreation due to increased noise or vibration	Chapter 25 Noise and Vibration	Section 30.7 (all impacts)	Noise generated by the project may affect local communities and tourists who use the area for recreation activities including walking, cycling, bird watching and, wildlife appreciation and star gazing.
Impacts to marine recreation	Chapter 15 Shipping and Navigation	Section 30.7 (all impacts)	The project may affect recreational coastal and water based activities.
Impacts on traffic for tourists and local communities accessing local assets and facilities	Chapter 24 Traffic and Transport	Section 30.7 (all impacts)	The impacts of construction traffic may affect access for local communities and tourists.

30.10 Interactions

330. The impacts identified and assessed in this chapter have the potential to interact with each other, which could give rise to synergistic[8] 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 30.29, along with an indication as to whether the interaction may give rise to synergistic impacts. Although it would seem that all impacts interact with

[8] Synergistic relates to the interaction or cooperation of two or more impacts to produce a combined effect greater than the sum of their separate effects.

all other impacts the synergies should be considered with regards the tourist's experience.

331. There are several impacts that would have synergies with other impacts. These are the availability of accommodation, visual impacts, and traffic increases. First of all, if visitors cannot book accommodation then they will not be able to visit for more than a day and the additional expenditure would be lost. Of those that still do visit, if traffic increases delay their travel then they would have less time available at tourism assets. If this is compounded by significant visual impacts then their enjoyment of the tourism experience would be significantly reduced and could lead to lower expenditure. However, assessment shows that these impacts are negligible to minor and therefore the resultant impact would also be minor.

332. A similar approach to understanding can be taken at coastal and inland areas. Impacts are coastal locations may interact and impacts are inland areas may interact. If aspects that lead to the enjoyment of the tourism experience are compounded then the likelihood of further expenditure and return visits is reduced. However, the assessment shows that as the significance of each impact is negligible it is unlikely for these effects would lead to a more significant impact on the tourist's enjoyment of coastal and inland areas.

Table 30.29 Interactions between impacts

Potential interactions between impacts Construction	1 Increased marine construction traffic	2 Disruption of marine recreational activities including sailing and other water sports	3 Deterioration to bathing water / Blue Flag beaches	4 Disruption to onshore coastal tourism and recreational assets	5 Visual impacts of construction activity to tourism and recreational receptors	6 Reduction of tourist accommodation availability due to non-resident work force	7 Obstruction or disturbance to inland tourism and recreation assets	8 Obstruction or disturbance to users of PRoW, paths and non-motorised routes	9 Traffic increase	10 Disruption or impacts to open access or public land
1 Increased marine construction traffic	-	Yes	Yes	No	Yes	Yes	No	No	Yes	No
2 Disruption of marine recreational activities including sailing and other water sports	Yes	-	Yes	No	Yes	Yes	No	No	Yes	No
3 Deterioration to bathing water / Blue Flag beaches	Yes	Yes	-	No	Yes	Yes	No	No	Yes	No
4 Disruption to onshore coastal tourism and	No	No	No	-	Yes	Yes	Yes	Yes	Yes	No

Potential interactions between impacts										
recreational assets										
5 Visual impacts of construction activity to tourism and recreational receptors	Yes	Yes	Yes		-	Yes	Yes	Yes	Yes	Yes
6 Reduction of tourist accommodation availability due to non-resident work force	Yes	Yes	Yes	Yes	Yes	-	Yes	Yes	Yes	Yes
7 Obstruction or disturbance to inland tourism and recreation assets	No	No	No	Yes	Yes	Yes	-	Yes	Yes	Yes
8 Obstruction or disturbance to users of PRoW, paths and non-motorised routes	No	No	No	Yes	Yes	Yes	Yes	-	Yes	Yes
9 Traffic increase	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	-	Yes
10 Disruption or impacts to open access or public	No	No	No	No	Yes	Yes	Yes	Yes	Yes	-

Potential interactions between impacts										
land										
Operation										
	1 Obstruction or disturbance to marine recreation		**2 Visual and noise impacts on land-based tourism and recreation assets**			**3 Permanent closure of paths or non-motorised routes**		**4 Reduction in visitor numbers due to tourist perceptions of wind farms**		
1 Obstruction or disturbance to marine recreation	-		No			No		Yes		
2 Visual and noise impacts on land-based tourism and recreation assets	No		-			Yes		Yes		
3 Permanent closure of paths or non-motorised routes	No		Yes			-		Yes		
4 Reduction in visitor numbers due to tourist perceptions of wind farms	Yes		Yes			Yes		-		
Decommissioning										
It is anticipated that the decommissioning impacts will be similar in nature to those of construction.										

30.11 Summary

333. Table 30.30 summarises the likely tourism and recreation effects associated with the proposed project during the construction and operation and maintenance phases of the proposed project. Following the assessment, it is anticipated that moderate adverse tourism and recreation impacts may occur in the short term to local tourist assets in the vicinity of the landfall works during the construction period due to the noise, traffic and general construction activities in a quiet rural area. These effects will be very localised and Norfolk Vanguard Limited will seek to mitigate for these in collaboration with directly affected stakeholders and the Local Planning Authority to ensure all potential impacts are within an acceptable level.

Table 30.30 Potential Impacts Identified for tourism and recreation

Potential Impact	Receptor	Value/ Sensitivity	Magnitude	Significance	Mitigation	Residual Impact
Construction						
Impact 1: Increased marine construction traffic affecting attractiveness of the coastline for Tourism and recreation.	Tourists	Low	Negligible	Negligible	None	Negligible
Impact 2: Disruption of marine recreational activities including sailing and other water sports	Recreational marine users	Low	Low	Negligible	None	Negligible
Impact 3: Deterioration to Bathing Water / Blue Flag beaches and resulting effect on Tourism and Recreation	Blue Flag beaches and associated local businesses	Medium	Negligible	Minor adverse	None	Minor adverse
Impact 4: Disruption to onshore coastal recreational and tourism assets	Tourism and recreation assets	Medium	Minor	Minor adverse	OLEMS CoCP TMP	Negligible
Impact 5: Visual impacts of construction activity	Tourists and local communities using the area recreationally	Low	Low	Minor adverse	OLEMS CoCP	Minor adverse

Potential Impact	Receptor	Value/ Sensitivity	Magnitude	Significance	Mitigation	Residual Impact
Impact 6: Reduction of tourist accommodation availability due to non-resident work force	Hotels and other accommodation	Low	Negligible	Negligible	None	Negligible
Impact 7: Obstruction or disturbance to inland tourism and recreation assets	Tourism and recreation assets	Medium	Low	Minor adverse	CoCP	Minor adverse
Impact 8: Obstruction or disturbance to users of paths or non-motorised routes	Tourists and local communities using the area recreationally	Medium to high	Low	Moderate to major adverse	CoCP	Negligible to minor adverse
Impact 9: Traffic increase	Pedestrian amenity	Low to High (see Chapter 24)	Medium to High	Moderate to major adverse	TMP CoCP	Minor adverse
Impact 10: Disruption or impacts to open access or public land	Open or public land areas	None interacted with	No Impact	No impact	None	No Impact
Operation						
Impact 1: obstruction of disturbance to marine recreation	Recreational marine users	Negligible	Negligible	Negligible	None	Negligible
Impact 2: Visual and noise impacts on land-based tourism and recreation assets	Tourists	Low	Negligible	Negligible	None	Negligible
Impact 3: Permanent closure of paths or non-motorised routes	Recreational users	Negligible	No Impact	No impact	None	No impact
Impact 4: Reduction in visitor numbers due to tourist perceptions of wind farms	Potential visitors to Norfolk	Low	No Impact	No impact	None	No impact
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 the same as those identified during the construction stage.						

Potential Impact	Receptor	Value/ Sensitivity	Magnitude	Significance	Mitigation	Residual Impact
Cumulative Construction						
Increased marine construction traffic affecting attractiveness of the coastline for tourism and recreation.	Tourists	Low	Negligible	Negligible	None	Negligible
Disruption of marine recreational activities including sailing and other water sports	Marine recreational users		No Cumulative Impact	No Cumulative Impact	None	No Cumulative Impact
Deterioration to Bathing Water / Blue Flag beaches and resulting effect on Tourism and Recreation	Tourists		No Cumulative Impact	No Cumulative Impact	None	No Cumulative Impact
Disruption to onshore coastal tourism and recreation assets	Tourism and recreation assets	Low	Low	Minor	None	Minor
Visual impacts of construction activity to tourism and recreation assets	Tourists and local communities using the area recreationally	Low	Low	Minor	Embedded mitigation: Site selection OLEMS CoCP	Minor
Reduction of tourist accommodation availability due to non-resident work force	Hotels and other accommodation	Low	Negligible	Negligible	None	Negligible
Obstruction or disturbance to inland tourism and recreation assets	Tourism and recreation assets	Low	Low	Minor	None	Minor
Obstruction or disturbance to users of PRoW and other non-motorised routes	Tourists and local communities using the area recreationally	Medium to high	Low	Moderate to major	Embedded mitigation: Consultation Site selection CoCP	Negligible to Minor
Traffic increase	Currently there is insufficient publicly available information to undertake a Cumulative Impact Assessment.					

Potential Impact	Receptor	Value/ Sensitivity	Magnitude	Significance	Mitigation	Residual Impact
Cumulative Operation						
Obstruction or disturbance to marine recreation	Marine recreational users		No Cumulative Impact	None	No Cumulative Impact	No Cumulative Impact
Visual and noise impacts on land-based tourism and recreation assets	Tourists	Low	Negligible	Negligible	None	Negligible
Cumulative impacts that effect tourism and recreation assets are further discussed in: • Chapter 24 Traffic and Access; • Chapter 25 Noise and Vibration; and • Chapter 29 Landscape and Visual Assessment.						

30.12 References

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