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White Cross Offshore Windfarm Environmental Statement

Non-Technical Summary

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Glossary of Acronyms

Acronym	Definition
AC	Alternating Current
ADR	Air Defence Radar
BRAG	Black, Red, Amber, Green
COANB	Cornwall Area of Outstanding Natural Beauty
DCO	Development Consent Order
DEA	Drag Embedment Anchors
DECC	Department for Energy and Climate Change
DNO	Distribution Network Operator
EIA	Environmental Impact Assessment
EMF	Electromagnetic Frequency
ES	Environmental Statement
GHG	Greenhouse Gas
GW	Giga Watts
HRA	Habitats Regulation Assessment
HV	High Voltage
ICES	International Council for the Exploration of the Sea
IEMA	Institute of Environmental Management and Assessment
INNS	Invasive Non Native Species
IPC	Infrastructure Planning Commission
km	Kilometre
LPA	Local Planning Authority
m	Metre
MCA	Marine Character Area
MCA	Maritime and Coastguard Agency
MCZ	Marine Conservation Zone
MHWS	Mean High Water Springs
MMMP	Marine Mammal Mitigation Protocol
MMO	Marine Management Organisation
MoD	Ministry of Defence
MPS	Marine Policy Statement
MW	Megawatts
NDCAONB	North Devon Coast Area of Outstanding Natural Beauty
NE	Natural England
nm	Nautical Mile
NPS	National Policy Statement
NSIP	Nationally Significant Infrastructure Project
NTS	Non-Technical Summary

Acronym	Definition
OSP	Offshore Substation Platform
OWL	Offshore Wind Ltd
PAH	Polycyclic Aromatic Hydrocarbon
PCNP	Pembrokeshire Coast National Park
PEXA	Practice and Exercise Area
PTS	Permanent Threshold Shift
RAF	Royal Air Force
SAC	Special Area of Conservation
SAR	Search and Rescue
SIP	Site Integrity Plan
SLVIA	Seascape, Landscape and Visual Impact Assessment
SSSI	Site of Special Scientific Interest
TCE	The Crown Estate
TJB	Transition Joint Bay
TTS	Temporary Threshold Shift
UK	United Kingdom
US	United States
UXO	Unexploded Ordnance
WPD	Wester Power Distribution
WSI	Written Scheme of Investigation
WTG	Wind Turbine Generator

Glossary of Terminology

Defined Term	Description
Applicant	Offshore Wind Limited
Cumulative effects	The effect of the Project taken together with similar effects from a number of different projects, on the same single receptor/resource. Cumulative effects are those that result from changes caused by other past, present or reasonably foreseeable actions together with the Project.
Engineer, Procure, Construct and Install	A common form of contracting for offshore construction. The contractor takes responsibility for a wide scope and delivers via own and subcontract resources.
Environmental Impact Assessment (EIA)	Assessment of the potential impact of the proposed Project on the physical, biological and human environment during construction, operation and decommissioning.
Export Cable Corridor	The area in which the export cables will be laid, either from the Offshore Substation or the inter-array cable junction box (if no offshore substation), to the National Grid Onshore Substation comprising both the Offshore Export Cable Corridor and Onshore Export Cable Corridor.
Front end engineering and design	Front-end engineering and design (FEED) studies address areas of windfarm system design and develop the concept of the windfarm in advance of procurement, contracting and construction.
Generation Assets	The infrastructure of the Project related to the generation of electricity within the windfarm site, including wind turbine generators, substructures, mooring lines, seabed anchors and inter-array cables.
High Voltage Alternating Current	High voltage alternating current is the bulk transmission of electricity by alternating current (AC), whereby the flow of electric charge periodically reverses direction.
High Voltage Direct Current	High voltage direct current is the bulk transmission of electricity by direct current (DC), whereby the flow of electric charge is in one direction.
In-combination effects	In-combination effects are those effects that may arise from the development proposed in combination with other plans and projects proposed/consented but not yet built and operational.
Inter-array cables	Cables which link the wind turbines to each other and the Offshore Substation Platform, or at the inter-array cables junction box (if no offshore substation). Array cables will connect the wind turbines to one and other and to the Offshore Substation (if utilised). The initial section for the inter-array cables will be freely suspended in the water column below the substructure (dynamic sections) while the on seabed sections of the cables will be buried where possible.
Jointing bay	Underground structures constructed at regular intervals along the Onshore Export Cable Corridor to join sections of cable and facilitate installation of the cables into the buried ducts.
Landfall	Where the offshore export cables come ashore.

Defined Term	Description
Link boxes	Underground chambers or above ground cabinets next to the cable trench housing electrical earthing links
Mean high water springs	The average tidal height throughout the year of two successive high waters during those periods of 24 hours when the range of the tide is at its greatest.
Mean low water springs	The average tidal height throughout a year of two successive low waters during those periods of 24 hours when the range of the tide is at its greatest.
Mean sea level	The average tidal height over a long period of time.
Mitigation	Mitigation measures have been proposed where the assessment identifies that an aspect of the development is likely to give rise to significant environmental impacts, and discussed with the relevant authorities and stakeholders in order to avoid, prevent or reduce impacts to acceptable levels. For the purposes of the EIA, two types of mitigation are defined: • Embedded mitigation: consisting of mitigation measures that are identified and adopted as part of the evolution of the project design, and form part of the project design that is assessed in the EIA • Additional mitigation: consisting of mitigation measures that are identified during the EIA process specifically to reduce or eliminate any predicted significant impacts. Additional mitigation is therefore subsequently adopted by OWL as the EIA process progresses.
Mooring system	The equipment (mooring lines and seabed anchors) that keeps the floating substructure in position during operation through a fixed connection to the seabed.
National Grid Onshore Substation	Part of an electrical transmission and distribution system. Substations transform voltage from high to low, or the reverse by means of the electrical transformers.
National Grid Connection Point	The point at which the White Cross Offshore Windfarm connects into the distribution network at East Yelland substation and the distributed electricity network. From East Yelland substation electricity is transmitted to Alverdiscott where it enters the national transmission network.
Offshore Development Area	The Windfarm Site (including wind turbine generators, substructures, mooring lines, seabed anchors, inter-array cables and Offshore Substation Platform (as applicable)) and Offshore Export Cable Corridor to MHWS at the Landfall. This encompasses the part of the project that is the focus of this application and Environmental Statement and the parts of the project consented under Section 36 of the Electricity Act and the Marine and Coastal Access Act 2009.
Offshore Export Cables	The cables which bring electricity from the Offshore Substation Platform or the inter-array cables junction box to the Landfall.

Defined Term	Description
Offshore Export Cable Corridor	The proposed offshore area in which the export cables will be laid, from Offshore Substation Platform or the inter-array cable junction box to the Landfall.
Offshore Infrastructure	All of the offshore infrastructure including wind turbine generators, substructures, mooring lines, seabed anchors, Offshore Substation Platform and all cable types (export and inter-array). This encompasses the infrastructure that is the focus of this application and Environmental Statement and the parts of the project consented under Section 36 of the Electricity Act and the Marine and Coastal Access Act 2009.
the Offshore Project	The Offshore Project for the offshore Section 36 and Marine Licence application includes all elements offshore of MHWS. This includes the infrastructure within the windfarm site (e.g. wind turbine generators, substructures, mooring lines, seabed anchors, inter-array cables and Offshore Substation Platform (as applicable)) and all infrastructure associated with the export cable route and landfall (up to MHWS) including the cables and associated cable protection (if required).
Offshore Substation Platform	A fixed structure located within the Windfarm Site, containing electrical equipment to aggregate the power from the wind turbines and convert it into a more suitable form for export to shore.
Offshore Transmission Assets	The aspects of the project related to the transmission of electricity from the generation assets including the Offshore Substation Platform (as applicable)) or offshore junction box, Offshore Cable Corridor to MHWS at the landfall.
Offshore Transmission Owner	An OFTO, appointed in UK by Ofgem (Office of Gas and Electricity Markets), has ownership and responsibility for the transmission assets of an offshore windfarm.
Onshore Development Area	The onshore area above MLWS including the underground onshore export cables connecting to the White Cross Onshore Substation and onward to the NG grid connection point at East Yelland. The onshore development area will form part of a separate Planning application to the Local Planning Authority (LPA) under the Town and Country Planning Act 1990.
Onshore Export Cables	The cables which bring electricity from MLWS at the Landfall to the White Cross Onshore Substation and onward to the NG grid connection point at East Yelland.
Onshore Export Cable Corridor	The proposed onshore area in which the export cables will be laid, from MLWS at the Landfall to the White Cross Onshore Substation and onward to the NG grid connection point at East Yelland.
Onshore Infrastructure	The combined name for all infrastructure associated with the Project from MLWS at the Landfall to the National Grid connection point at East Yelland. The onshore infrastructure will form part of a separate Planning application to the Local Planning Authority (LPA) under the Town and Country Planning Act 1990.
Onshore Transmission Assets	The aspects of the project related to the transmission of electricity from MLWS at the Landfall to the NG grid connection point at East Yelland including the Onshore Export Cable, the White Cross Onshore Substation and onward connection to the NG grid connection point at East Yelland.

Defined Term	Description
the Onshore Project	The Onshore Project for the onshore TCPA application includes all elements onshore of MLWS. This includes the infrastructure associated with the offshore export cable (from MLWS), landfall, onshore export cable and associated infrastructure and new onshore substation (if required).
Offshore Wind Limited	Offshore Wind Ltd (OWL) is a joint venture between Cobra Instalaciones Servicios, S.A., and Flotation Energy Ltd
the Project	the Project is a proposed floating offshore windfarm called White Cross located in the Celtic Sea with a capacity of up to 100MW. It encompasses the project as a whole, i.e. all onshore and offshore infrastructure and activities associated with the Project.
Project Design Envelope	A description of the range of possible elements that make up the Project design options under consideration. The Project Design Envelope, or 'Rochdale Envelope' is used to define the Project for Environmental Impact Assessment (EIA) purposes when the exact parameters are not yet known but a bounded range of parameters are known for each key project aspect.
Safety zones	A marine zone outlined for the purposes of safety around a possibly hazardous installation or works / construction area.
Service operation vessel	A vessel that provides accommodation, workshops and equipment for the transfer of personnel to turbine during OMS. Vessels in service today are typically up to 85m long with accommodation for about 60 people.
Scour protection	Protective materials to avoid sediment being eroded away from the base of the foundations as a result of the flow of water.
Transition joint bay	Underground structures at the Landfall that house the joints between the offshore export cables and the onshore export cables.
White Cross Offshore Windfarm	100MW capacity offshore windfarm including associated onshore and offshore infrastructure
White Cross Onshore Substation	A new substation built specifically for the White Cross project. It is required to ensure electrical power produced by the offshore windfarm is compliant with NG electrical requirements at the grid connection point at East Yelland.
Windfarm Site	The area within which the wind turbines, Offshore Substation Platform and inter-array cables will be present
Works completion date	Date at which construction works are deemed to be complete and the windfarm is handed to the operations team. In reality, this may take place over a period of time.

1. Introduction

1.1 Purpose of this document

1. This document is the Non-Technical Summary (NTS) of the Environmental Statement (ES) for the proposed White Cross Offshore Wind Farm (hereafter referred to as 'the Offshore Project'). The NTS is intended to act as a high-level stand-alone document which provides a description of the proposed Offshore Project and a summary of the site selection process, the key findings of the Environmental Impact Assessment (EIA) process and mitigation measures identified in non-technical terms. For further information, the full ES should be referred to.

2. The ES describes the potential environmental impacts associated with the Offshore Project which may arise from construction, operation and maintenance, and decommissioning of the Offshore Project. The purpose of the ES is to provide the necessary information on the impact assessments undertaken as required under the 'Electricity Works (Environmental Impact Assessment) (England and Wales) Regulations 2017' and the Marine Works (EIA) Regulations 2007 (as amended) (herein 'the EIA Regulations'). The Offshore Project for the offshore Section 36 and relevant Marine Licence applications includes all components seaward of Mean High Water Springs (MHWS). Planning permission under the Town and Country Planning Act 1990 is required for the onshore (and intertidal) components and will be submitted separately.

1.2 The Project Team

1.2.1 Offshore Wind Limited

3. The successful partnership between Cobra Instalaciones Servicios, S.A., and Flotation Energy Ltd, known as Offshore Wind Limited (OWL), has delivered the Kincardine Floating Offshore Windfarm project and also secured development rights for the 480MW Morecambe offshore wind project in the Irish Sea. OWL is also working on further developments in the United Kingdom (UK), Ireland and Taiwan.

1.2.2 Royal HaskoningDHV

4. Royal HaskoningDHV was commissioned by OWL as the consultant to lead the White Cross EIA. Royal HaskoningDHV has been supported through the EIA process by several sub-consultants who are responsible for particular specialist topics. Royal HaskoningDHV is an environmental and engineering consultancy with significant expertise in offshore renewable energy.

5. Royal HaskoningDHV has provided environmental, development and consenting support on over 14 Giga Watts (GW) of renewable energy projects across 26 UK

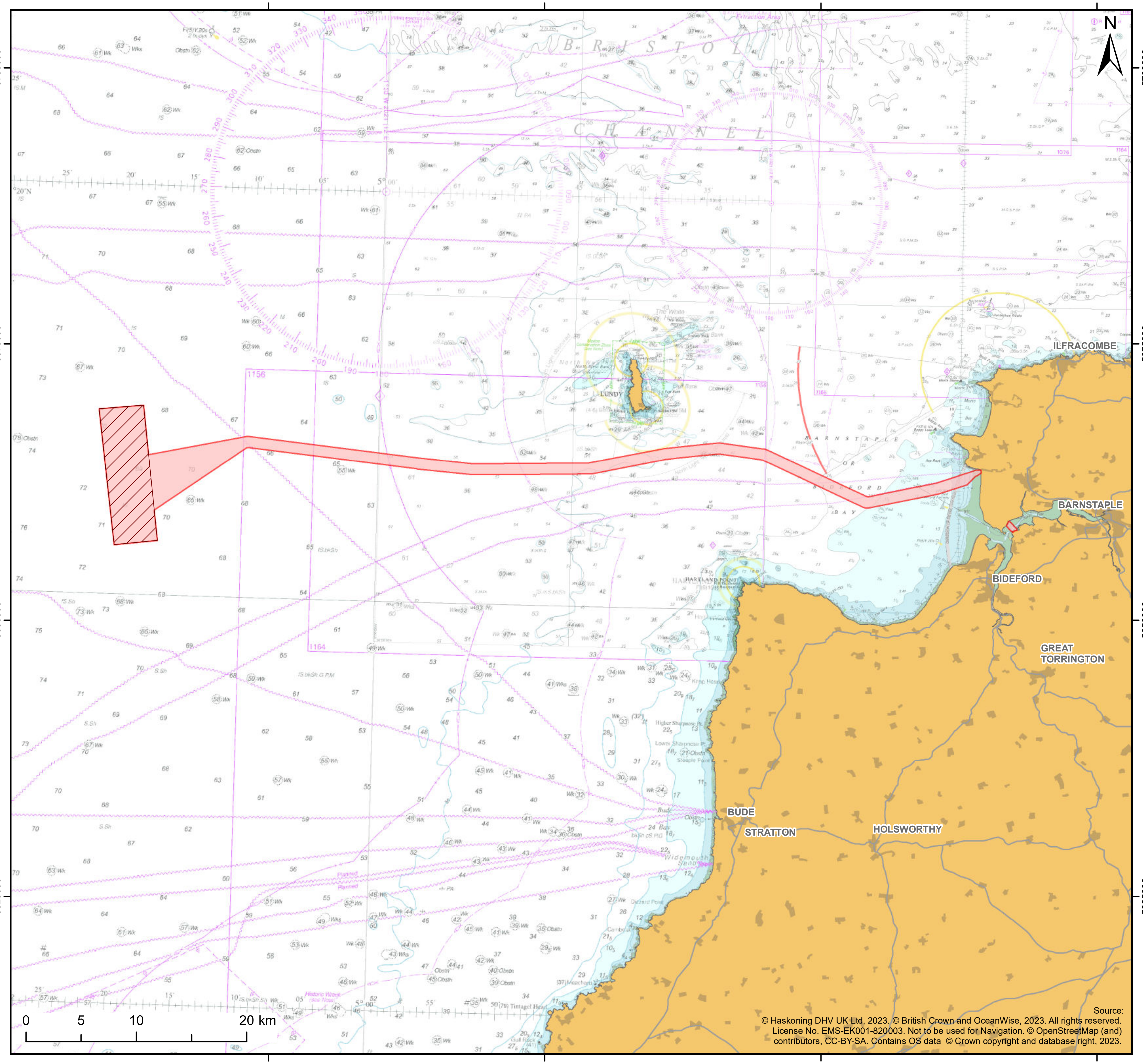
offshore wind farms. Their EIA activities and ESs are accredited by the Institute of Environmental Management and Assessment (IEMA) under the EIA Quality Mark Scheme. This demonstrates Royal HaskoningDHV's commitment to ensuring the EIA process is delivered to a high quality and in accordance with best practice.

1.3 Project Overview

6. The Offshore Project is a proposed floating offshore windfarm located in the Celtic Sea with a capacity of up to 100MW. The Offshore Project is being developed by OWL a joint venture between Cobra Instalaciones Servicios, S.A., and Flotation Energy Ltd. Six to eight semi-submersible floating platforms and Wind Turbine Generators (WTGs) are being considered.

7. The site area is 50km^2 and at its closest point the windfarm site is located 52.5km off the North Cornwall and North Devon coast (west-north-west of Hartland Point). It is assumed that the electricity generation at individual wind turbines will be connected via inter-array cables from turbines to an Offshore Substation Platform before being transferred via the Offshore Export Cable to shore. However, if an Offshore Substation is not required, inter-array cables will connect to an inter array junction box before being exported to shore by the Offshore Export Cable. The Offshore Export Cable will come ashore at a Landfall at Saunton Sands on the North Devon Coast.

8. A connection agreement has been made with the National Grid as the Distribution Network Operator (DNO) to connect to the existing substation at East Yelland. The Offshore Project location is shown in **Figure 1.1.**



Legend:

- Windfarm Site
- Offshore Development Area

Client:	Project:
Offshore Wind Ltd.	White Cross Offshore Windfarm

Title:

Project Location

Figure:	1.1	Drawing No:	PC2978-RHD-ZZ-XX-DR-Z-0565		
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P01	08/03/2023	GC	CB	A3	1:350,000

Co-ordinate system: WGS 1984 UTM Zone 30N

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1.4 Purpose of the Project

9. The Offshore Project has been brought forward through The Crown Estate's Test and Demonstration leasing opportunity which is designed to support the development and commercialisation of innovative energy technologies that will be vital to the UK's future energy system and net zero transition. The Offshore Project will test new foundation and mooring technologies, using new designs, materials and construction approaches. It also aims to play an important role in supporting the development and momentum of the Southwest and regional supply chain, helping support new jobs, skills and economic growth.

10. Climate change is a global issue resulting from the increase of carbon emissions into the atmosphere. Generating and harnessing energy from renewable sources is a vital step to substantially reducing carbon emissions whilst aiding in the challenge of meeting energy demand as part of a balanced energy portfolio.

11. The Climate Change Act 2008 (2050 Target Amendment) Order 2019 enshrines into UK law a commitment that the net UK carbon account for the year 2050 is at least 100% lower than the 1990 baseline i.e. 'net zero'. Floating wind will be essential for the UK to meet net zero emissions by 2050. The Offshore Project will support the Government's target to deliver 5GW of floating wind capacity in UK waters by 2030.

12. By generating low carbon, renewable electricity in the UK, the Offshore Project will also help to reduce the UK's reliance on imported energy. With existing fossil fuels and nuclear-powered electricity generation coming to the end of their operational lives, there is a need for a replacement. Electricity generation in the UK fell by 2.4% between 2018 and 2019 and by 15% between 2010 and 2019. This, highlights the need for new infrastructure to deliver a secure national energy supply as part of a long-term sustainable energy policy and to support the UK Government's policy to "*Build Back Better*" (HM Government, 2021). Further detail is provided in **Chapter 2: Need for the Project** and **Chapter 3: Policy and Legislative Context** in the ES**.**

1.5 Site Selection and Assessment of Alternatives

13. The Windfarm Site was established in 2021 through the site selection process associated with the Crown Estate Test and Demonstration leasing opportunity. Several grid connection options were identified considering proximity to the Windfarm Site location. These options were narrowed down to East Yelland and Alverdiscott.

14. Following an examination of the two options, an application for a grid connection was submitted to Western Power Distribution (WPD), now National Grid. The outcome of this application was a connection agreement (secured in November

2021) with National Grid as the DNO to connect to the existing substation at East Yelland which will utilise the remaining capacity at this grid connection.

15. The siting, design and refinement of the Offshore Project follows a site selection process, taking account of environmental, physical, technical, commercial and social considerations and opportunities. Engineering feasibility is also a key consideration for suitable options and site selection. Finally, the aim of identifying sites is to ensure that they will, in the long term, provide the lowest cost of energy.

16. Following identification of the offshore windfarm site and the location of the National Grid connection point, site selection began to consider potential routes between the two locations. The site selection process involved environmental, technical, social and cost considerations. In addition, stakeholder engagement played a key role in influencing the site selection process. The product of the site selection process was the identification of the Offshore Export Cable Corridor, the Landfall, the Onshore Export Cable Corridor, and the Onshore Substation.

17. At the Short List stage, a black, red, amber, green (BRAG) assessment was used to quantitatively, where possible, indicate the potential impacts of each site and route option. This assessment drove the selection of the preferred option. Full details are provided in the Short List Report appended to **Chapter 4: Site Selection and Assessment of Alternatives**.

18. In summary, the initial drivers influencing the offshore and onshore route selection from the outset are:

- The Award for Lease which identifies the array location
- The identified National Grid connection point
- The likely area of where the proposed additional substation will be situated
- The location and refinement of the Offshore Project landfall
- Environmental, social, technical and commercial considerations.

1.5.1 Consultation

19. To inform the route selection process, focussed individual consultation has taken place with a range of stakeholders. For further details on the consultation please see **Section 1.8.**

1.5.2 Identification of the Windfarm Site

20. The Windfarm Site boundary was established through site selection associated with The Crown Estate (TCE) Test and Demonstration opportunity. Environmental, technical and commercial constraints and factors were analysed including:

- Physical parameters (including water depths, wave height, ground conditions and wind resource)
- Grid connection
- Landscape designations
- Environmental designations
- Sensitive ecological habitats (ecological receptors)
- Other users (e.g. Ministry of Defence (MoD) activity, shipping and navigation, National Air Traffic (NATs) services, fishing activity, oil and gas infrastructure and key resource areas (marine aggregates and tidal energy))
- Cumulative effects with other licensed activities.

1.5.3 Identification of the Grid Connection Point

The Offshore Project examined several different potential grid connection options which were narrowed down to East Yelland and Alverdiscott based on proximity to the Windfarm Site. Following an examination of the two options, an application for a grid connection was submitted to the National Grid, with a connection agreement secured in November 2021. The outcome of this application was a connection to East Yelland as opposed to Alverdiscott further to the south. There were several reasons for the project connection being at East Yelland. These include:

- East Yelland offers a logistically sensible connection to the energy distribution network due to its location adjacent to the shore.
- Due to the size of the Offshore Project, with a capacity of up to 100MW, it is able to utilise the remaining spare capacity at the East Yelland substation, something that few other energy developments would be able to do, minimising the requirement to undertake further substation development as part of the offshore project.
- A route to Alverdiscott would have resulted in a longer cable route which would likely result in a greater number of environmental, physical, technical, commercial and social constraints for the Offshore Project. Due to the size of the Offshore Project, and its status as Test and Demonstration project, further constraints may have deemed it un-economically viable.
- By not connecting into Alverdiscott this substation remains available for future projects likely to arise in further leasing rounds in the Celtic Sea. These projects will have much larger capacity requirements. Developing a cable route to Alverdiscott for the Offshore Project risks sterilising the land required by future larger projects for their cable routes. `

1.5.4 Identification of the Landfall location

21. The key drivers for the identification of the landfall Area of Search were the:

- Location of the grid connection point
- Location of the Offshore Project Agreement for Lease area
- The presence of significant ecological designations along the coast
- The presence of coastal settlements and other coastal development
- Technical and commercial considerations.

22. Three potential landfall zones along the coastline were identified with the potential to accommodate the required infrastructure and were taken forward to the Long List stage:

- North Zone Landfall- Putsborough to Woolacombe (length of frontage is 2.5km)
- Mid Zone Landfall– Instow to Saunton Down (length of frontage is 7.6km)
- South Zone Landfall - Peppercombe to Rock Nose (length of frontage is 6.3km).

23. After further assessment, it was concluded that the North zone landfall was unsuitable due to transport and access issues; sensitive archaeological receptors and the steep slopes would cause engineering complexity.

24. Given there are no significant aspects that discount either the Mid and South landfall zones, the onshore considerations have therefore been considered to determine whether one landfall zone was preferable. Considering onshore components, the Mid Zone landfall is preferred due to engineering, environmental and social considerations. The one key issue at the Mid Zone landfall is the presence of the Braunton Burrows Special Area of Conservation (SAC) and potential sensitivity to disturbance. However, development of the onshore route location, design, and potential construction techniques are believed to prevent any direct long-term impacts to the SAC and its features. The requirement for mitigation, particularly haul roads and temporary access, for the South Zone landfall routes would be much more extensive due to its longer length and the undulating landscape that would make access for construction vehicles difficult.

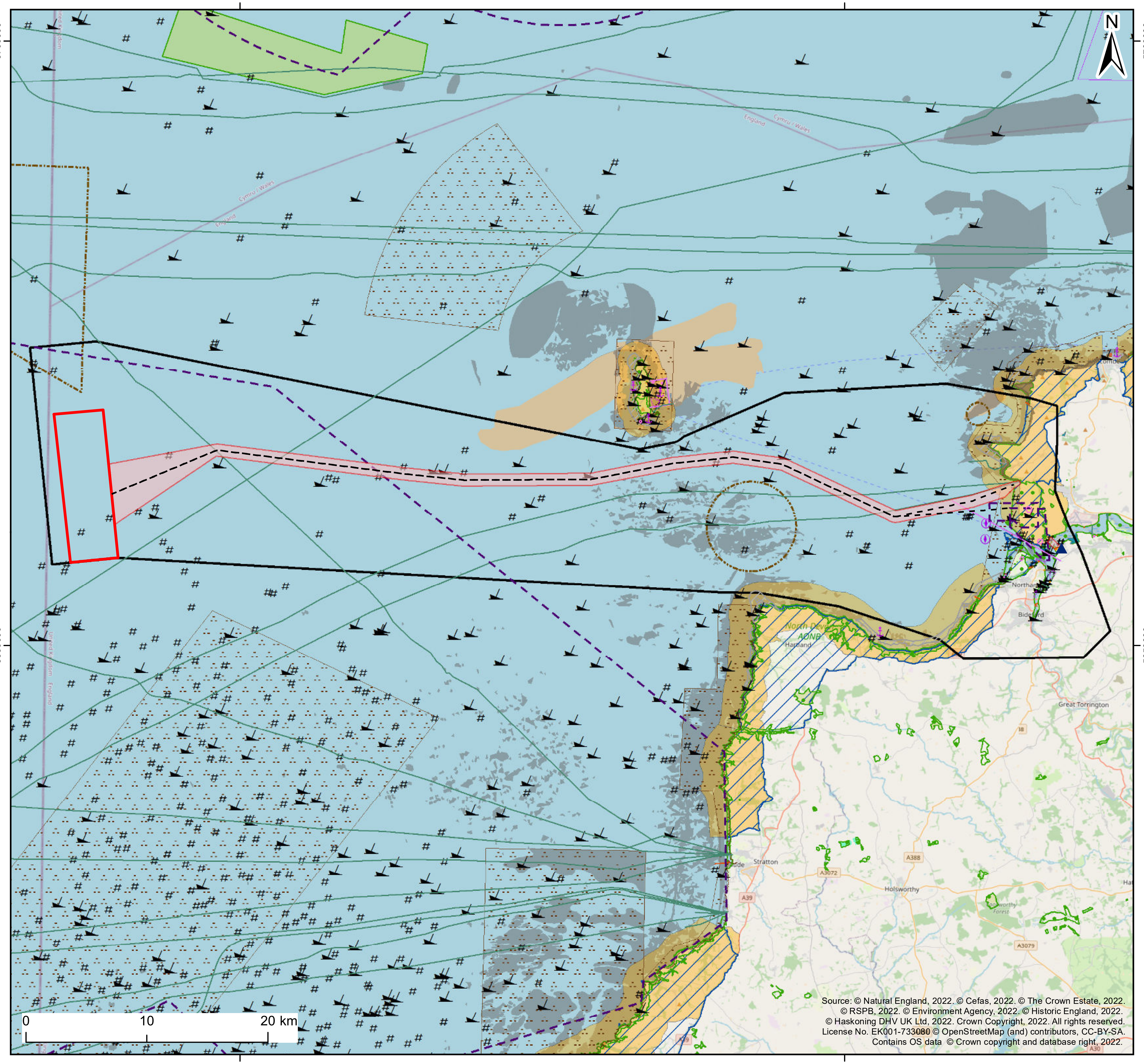
1.5.5 Identification of the Corridor for the Offshore Export Cable

25. Following the identification of the Area of Search, the long list of Offshore Export Cable Corridors was developed linking the windfarm site to the short list of landfall locations, considering a number of design principles. After the formation of a long list and further assessments to create a short list of corridors, one corridor route was selected which:

- Ensured no impact on the Bristol Channel Approaches SAC
- Ensured no long-term impact on the Braunton Burrows SAC

- Ensured no long-term impact on the Bideford to Foreland Point Marine Conservation Zone (MCZ)
- Avoids potential Annex 1 reef habitat as far as possible
- Avoids wrecks and obstructions
- Avoids features of archaeological potential
- Avoids the Braunton Burrows Military Training Area
- Maximises distance and depth over which crossing of the Appledore Recommended Route (a recommended navigation route into and out of Appledore) occurs
- Maximise distance from the Pilot Boarding Station
- Avoids cable crossings where depth is <20m.

26. The cable route constraints are shown in **Figure 1.2.**



Legend:

- Project Boundary
- Area of Search
- Offshore Export Cable Corridor
- Indicative Centre Line
- Potential Grid Connection Locations
- Offshore Wave Site Pre-planning Application
- Closed Disposal Sites
- Marine Conservation Zones (MCZ)
- Sites of Special Scientific Interest (SSSI)
- Areas of Outstanding Natural Beauty (AONB)
- Heritage Coast
- National Nature Reserves (NNR)
- Important Bird Areas (IBA)
- RSPB Reserve Boundary
- Annex 1 Sandbanks
- Annex 1 Reef
- Anchorage area
- Pilot boarding place
- Anchorage area
- Military practice area
- Restricted area
- Harbour area (administrative)
- Submarine Cable
- Pipeline
- Harbour facility
- Harbour facility
- Navigation line
- Route, Ferry
- Route, Recommended
- Obstruction
- Wreck
- Obstruction

Client:	Project:
Offshore Wind Ltd.	White Cross Offshore Windfarm

Title:

Proposed Offshore Export Cable Corridor and Landfall

Figure: 1.2 | Drawing No: PC2978-RHD-ZZ-XX-DR-Z-0458

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
P02	03/03/2023	AB	CB	A3	1:320,000
P01	15/12/2022	AB	CB	A3	1:320,000

Co-ordinate system: WGS 1984 UTM Zone 30N

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1.5.6 Wind Farm Design and Engineering Alternatives

28. The Floating Offshore Windfarm Site will comprise of floating platforms and WTGs. Each WTG will follow conventional offshore design architecture, with three blades and a horizontal rotor axis. All the WTGs will be supported by floating substructures (platforms), each platform accommodates one turbine.

29. Turbine design is advanced technology built up over the last two decades of offshore turbine manufacturing. Turbine size is the key aspect that has continually developed, providing larger and therefore more efficient turbines. As such, no specific size has been selected and assessed within this ES, rather a range of sizes have been assessed based on the worse case impacts on relevant receptor(s).

30. A substructure is required for buoyancy and stability to enable the efficient operation of the turbine. The Offshore Project has completed a selection process and feasibility studies to understand which substructure categories and concepts will be most suitable for the project. Through this selection process the only substructure category being considered is semi-submersibles. Each type of semi-submersible substructure has varying shapes and dimensions. The floating substructure design envelope has been formulated to cover the range of technologies under consideration and the largest WTG scenario.

31. There are three possible mooring systems available in the market. These are drag embedment anchors (DEA), pin piles, or suction piles. Currently all options remain available. Determination will be made on the basis of analysis of geotechnical data and mooring contractor design. Consequently, the realistic worst-case parameters have been detailed in **Chapter 5: Project Description**.

1.6 The EIA Process and ES Structure

32. The EIA process includes collation of data from a variety of desk-based studies and site specific survey. This is then used to identify and assess the potential effects of a development. The assessments identify any significant adverse effects and any measures envisaged to avoid, prevent or reduce and, if possible, offset, such significant effects.

33. A number of consultation events, targeted stakeholder engagement and Expert Topic Group (ETG) meetings have taken place as detailed within the ES **Chapter 7: Consultation**. Within local areas, public engagement events have also been held to answer questions and gain feedback. Feedback from these consultation and engagement events have been taken into consideration and where relevant, used to inform the design development and final design of the Offshore Project.

34. The purpose of the ES is to inform the decision-maker, stakeholders and all interested parties of any significant environmental effects that would result from the

Offshore Project during its construction, operation and maintenance, and (where relevant) decommissioning. The information contained within the ES can also be used by affected parties to evaluate the acceptability of the development and its potential effects.

35. The EIA for the Offshore Project has comprised:

- Identification of the existing environment, through desk-based studies and surveys
- Assessment of impacts
- Development of mitigation and enhancement measures (where necessary)
- Identification of residual effects.

36. This ES also includes the following separate environmental assessments as appendices:

- Water Framework Directive Compliance Assessment – see Chapter 9: Marine Water and Sediment Quality Appendix 9.A
- Marine Conservation Zone Assessment – see Chapter 10: Benthic and Intertidal Ecology Appendix 10.A
- Habitats Regulations Assessment – see Chapter 13: Offshore Ornithology Appendix 13.A.

37. The methodologies for each of these assessments will be covered in the respective assessment methodology section of each report.

1.7 The role of National Policy Statements in the decision making process

38. National Policy Statements (NPS) are statutory documents which set out the government's policy on specific types of Nationally Significant Infrastructure Projects (NSIPs) and are published in accordance with the Planning Act 2008.

39. The Planning Act 2008 makes provision for NPSs, which are designed to set the policy framework for determination of NSIP applications. They integrate the UK Government's objectives for infrastructure capacity and development with its wider economic, environmental and social policy objectives, including climate change goals and targets, in order to deliver sustainable development.

40. Although the Offshore Project is not an NSIP, it is recognised that due to its size of 100MW and its location in English waters, certain NPS are considered relevant to the Offshore Project and decision-making and are referred to in this ES.

41. There are twelve NPSs in total, of which six are relevant to energy and are produced by the former Department of Energy and Climate Change (DECC). The three NPSs of relevance to the Offshore Project include:

- EN-1 Overarching Energy NPS (DECC, 2011a): Sets out the government's policy, regulatory framework and high-level objectives in relation to development of energy infrastructure. In combination with the relevant technology-specific energy NPSs, provides the basis on which the Infrastructure Planning Commission (IPC) makes its decisions in relation to applications for energy developments that fall within the scope of NPSs.
- EN-3 Renewable Energy Infrastructure NPS (DECC, 2011b): Considered together with EN-1 to form the primary policy for the IPCs decisions on applications for nationally significant renewable energy infrastructure. This NPS also includes general principles on how assessment of impacts is applied for renewable energy projects Development Consent Order (DCO) applications.
- EN-5 Electricity Networks Infrastructure (DECC, 2011c): Considers the electrical infrastructure associated with an NSIP.

42. It is noted that the NPSs are currently in the process of being revised. Although these NPSs are relevant for the Offshore Project, it should be noted the Offshore Project is not a DCO application.

1.7.1 Other Planning Policies

Marine Plans

43. The Marine Policy Statement (MPS) (HM Government, 2011) provides a high-level approach to marine planning and general principles for decision making that contribute to the NPS objectives. It also sets out the framework for environmental, social and economic considerations that need to be taken into account in marine planning. The UK is divided into marine planning regions, each having its own planning authority responsible for preparing a marine plan for their area. The Marine Management Organisation (MMO) is the planning authority in England.

44. England currently has nine marine plans; those relevant to the Offshore Project are the South West Inshore and South West Offshore Marine Plans (HM Government, 2021). Marine planning provides a framework for decisions on Marine activities, reduces user conflict, while encouraging an ecosystem-based approach.

45. The South West Marine Plan details specific policies including SW-REN-1, SW-REN-2 and SW-REN-3 (REN being the renewables grouping code). These policies support proposals that enable the provision of renewable energy technologies, safeguards areas held under a lease or an agreement for lease for renewable energy generation

from other proposals for new activity and supports proposals to install infrastructure for the generation of offshore renewable energy respectively.

1.8 Consultation

46. To agree and discuss the Site Selection, EIA and Habitats Regulation Assessment (HRA) requirements during the scoping stage, focussed individual consultation took place with experts from relevant organisations with a clear statutory role or non-statutory interest in the topics considered. Scoping stage consultation was targeted at stakeholders considered the highest priority.

47. Following the receipt of the Scoping Opinion, working groups were established and met on a regular basis to provide additional expert input into the EIA and HRA processes. This facilitates a consensus to be reached on the scope and approach to the impacts included within the EIA, and the comprehensiveness and suitability of data used. Consultation details provided here are solely related to the Offshore Project (up to MHWS), onshore consultation details are not provided but will be included in the onshore ES application. Full details of the consultation undertaken are provided in **Chapter 7: Consultation**.

48. To inform the route selection, a series of meetings with stakeholders included the following steps:

- Outline the route selection principles
- Discuss the potential Offshore Export Cable Corridors
- Gain early feedback on unidentified constraints or opportunities

49. Feedback on potential Offshore Export Cable Corridors has been received during meetings with a range of stakeholders. Specific route selection meetings were held with the following stakeholders to discuss potential Offshore Export Cable Corridors:

- Maritime and Coastguard Agency (MCA)
- Cornish Fish Producers Organisation
- North Devon Fisherman's Association
- Bideford Harbour Board
- Christie Devon Estates
- MMO
- Natural England (NE)

50. Full details of the consultation undertaken are provided in the ES, **Chapter 7: Consultation**.

2. White Cross Offshore Project Description

2.1 Offshore works

51. An illustration of the main components of the Offshore Project (up to MHWS) is provided in **Plate 2.1** below. The offshore export cable makes landfall at Saunton Sands on the North Devon coast. Cable installation underneath the Taw-Torridge estuary will be done using trenchless technology.

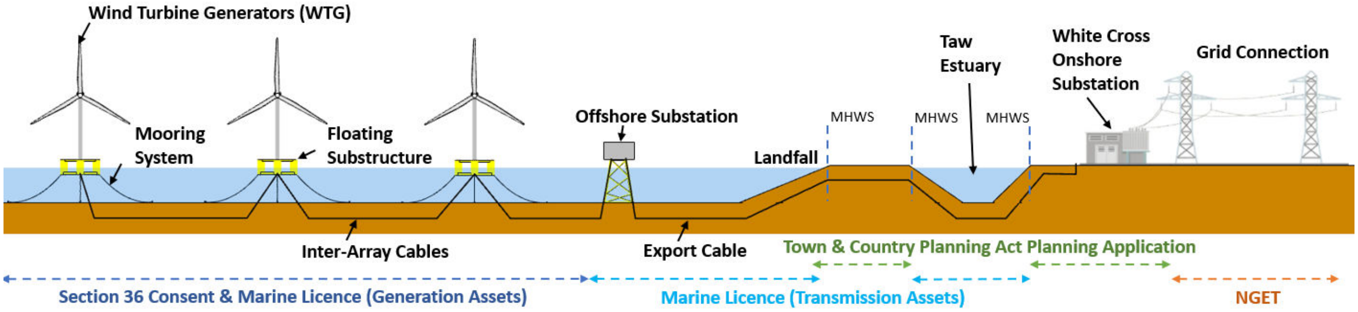


Plate 2.1 Project Infrastructure

52. Once built, the Offshore Project will have a generating capacity of up to 100MW, with the key offshore components comprising:

- 5 to 8 semi-submersible floating platforms and WTGs
- Associated subsea mooring lines
- A range of potential anchoring solutions (drag embedment anchors, suction anchor or pin piles)
- Up to ten dynamic inter-array cables and associated protection
- Offshore substation (requirement to be confirmed)
- Offshore Export Cable connecting the offshore substation to the landfall (2 circuits will contain 2 separate cables, each circuit contains the 3 cores and a fibre optic line wrapped into a single cable), cable joints, associated protection
- Other associated offshore infrastructure, such as navigational markers

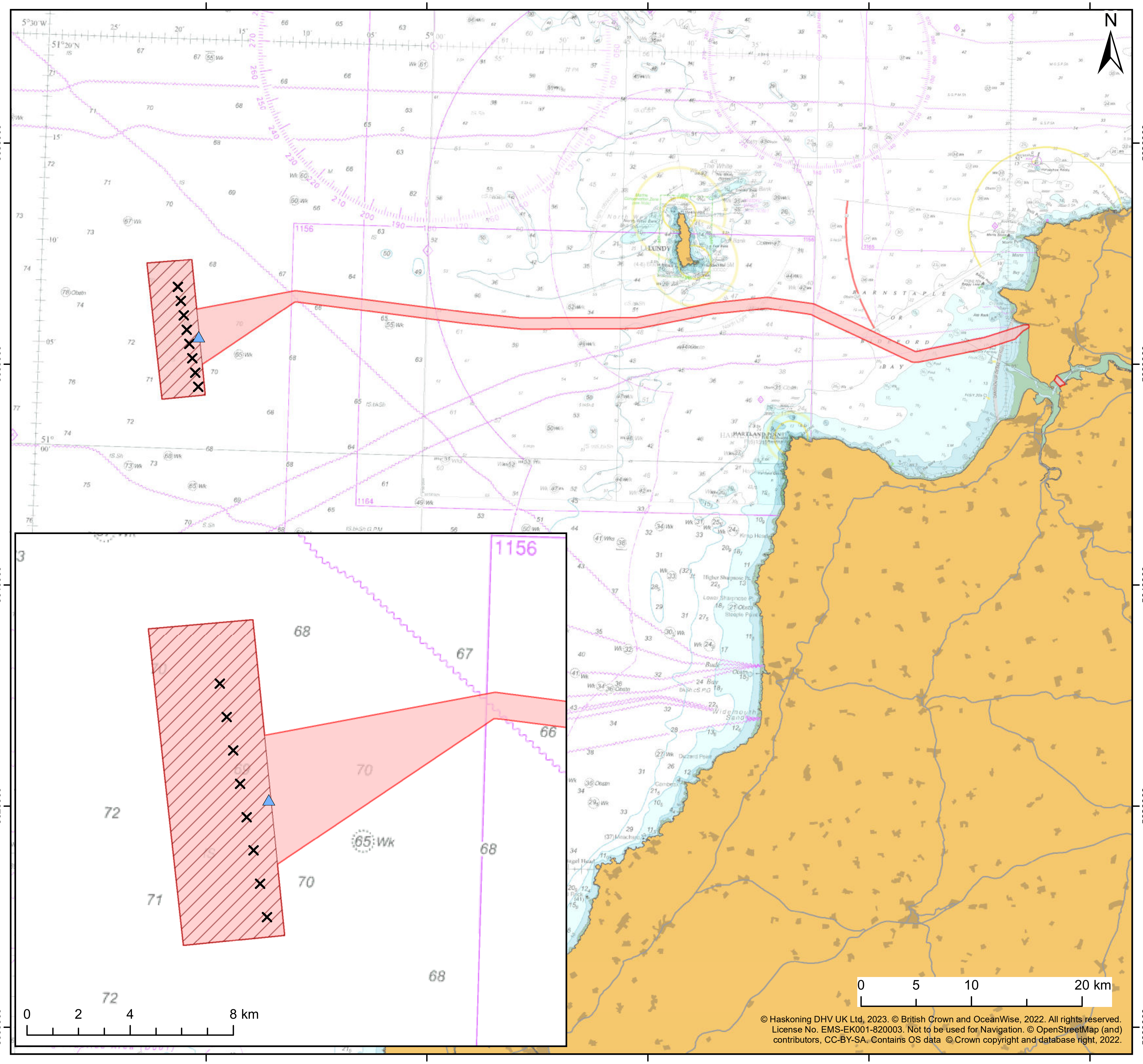
53. It is anticipated that the construction of the Offshore Project will take 28 months (18 months for onshore assembly and integration of WTGs and 16 months offshore construction activities, activities will overlap). The operational phase of the Offshore Project will last for a minimum of 25 years. The decommissioning phase will depend on the methods used however it is expected to be shorter than the time taken for the construction period.

2.1.1 Wind Turbine Generators

54. The size and capacity of the WTGs that will be utilised at the Windfarm Site has yet to be selected and as such the Offshore Project Design Envelope is necessarily broad to accommodate the range of WTGs under consideration and innovations in currently available WTG technologies. Each WTG will follow conventional offshore design architecture with three blades and a horizontal rotor axis. The Offshore Design Envelope covers a range of parameters and the worst-case impacts for each technical topic have been assessed based upon these. The EIA has assessed for turbines up to an individual capacity of 18MW. However, the size and capacity of the wind turbines will be decided at a later stage, prior to final investment decision. Technology develops rapidly and the available sizes of turbines are expected to increase over the coming years.

2.1.2 Array Layout Description

55. An indicative WTG array layout is shown in **Figure 2.1**. The final array layout will be determined after consideration of a number of factors, for example, the number of WTGs selected, efficiency in installation and operation, and local site conditions. The final array layout is proposed to be confirmed in consultation with the Regulator post consent and prior to the commencement of construction.



Legend:

- Windfarm Site
- Offshore Development Area
- Wind Turbine Locations
- Offshore Substation Platform

Client:	Project:
Offshore Wind Ltd.	White Cross Offshore Windfarm

Title:

Indicative Locations of the Infrastructure in the Windfarm Site

Figure: 2.1 Drawing No: PC2978-RHD-ZZ-XX-DR-Z-0562

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
P01	07/03/2023	GC	SF	A3	1:350,000

Co-ordinate system: WGS 1984 UTM Zone 30N

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2.1.3 Wind Turbine Anchors and Mooring

56. The floating substructure requires moorings to anchor the turbine to the seabed in order to maintain position. The type and number of anchors and moorings used for the Offshore Project will depend on the design of the floating substructure and WTGs, as well as environmental considerations.

57. Potential types of mooring being considered are, see **Plate 2.2**:

- Catenary mooring: Predominantly steel chains but can also include some sections of synthetic components. The weight of the catenary mooring provides the force needed to maintain the position of the floating substructure. A large section of the mooring chain lies on the seabed. These systems typically have larger footprints, but can be reduced through the attachment of clump weight and/or heavy chain sections near to where the mooring line comes into contact with the seabed.
- Semi-taut mooring: A combination of synthetic fibres and steel chain, where the chain sections provide anchoring benefits of the Catenary system and the synthetic fibres, under some tension, limit the amount of steel chain required, providing benefits in the overall footprint of the mooring system;
- Taut spread mooring: Synthetic fibres or wires with small link components of chain. The system is placed under significant tension to create a stable mooring system where all of the stability comes from the tension held within the taut mooring line.

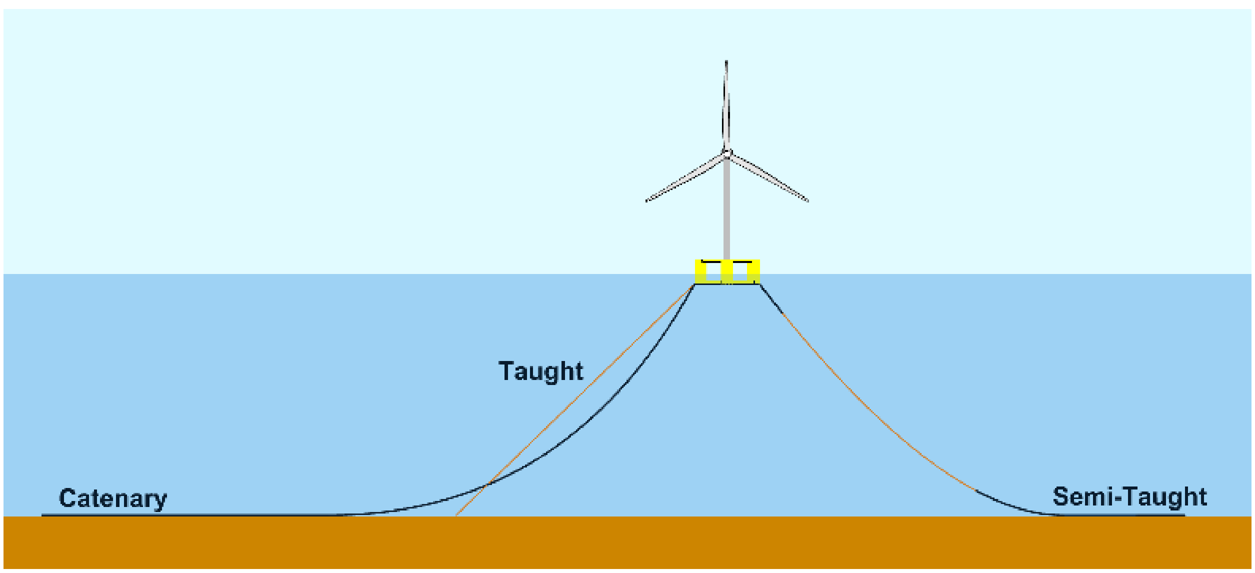


Plate 2.2 Mooring Configurations

2.1.4 Wind Turbine Floating Substructure Installation

58. Conventional fixed substructures are less suitable for deeper waters (>60m), and floating substructures, where water depth presents less of an issue, could be a

viable option. In addition to allowing turbines to be installed in deeper waters further from shore, floating structures offer benefits in that their construction is largely yard based, with significantly less offshore construction activity, therefore reducing the impacts of offshore construction and the cost and scheduling uncertainties traditionally associated with more conventional windfarm construction.

59. The floating substructure provides a base for the installation of the wind turbine, see **Plate 2.3**. The substructure has three key components: (1) the mooring system, which anchors the structure to the seabed; (2) the substructure, a floating structure that supports the wind turbine; and (3) the transition piece, which provides the connection from the substructure to the wind turbine tower. Substructures are typically made of tubular steel columns.

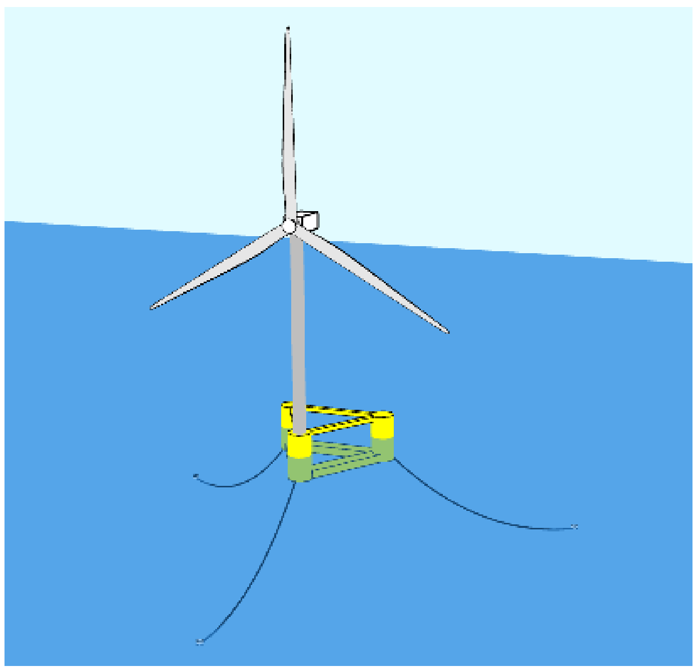


Plate 2.3 Illustration of characteristic semi-submersible substructure

60. The substructure is constructed, and the turbine installed in a dry dock or inshore thus reducing the high costs of assembly and installation at sea. Once complete it is towed to site where it is attached to the pre-installed moorings and inter-array cables. The substructure is then fully ballasted by pumping water into the structure, moorings picked up and tensioned, electrical cable head pulled-in and the WTG commissioned.

2.1.5 Electrical System

61. The electrical transmission system links together all of the different parts of the Offshore Project. The electrical transmission system will collect the power produced at the wind turbines and transport it to the UK electricity transmission network.

62. It is assumed that the electricity generation at individual wind turbines will be connected via inter-array cables from turbines to an offshore substation platform (OSP) before being transferred via the offshore export cable to shore. However, if an offshore substation is not required, inter-array cables will connect to one wind turbine before being bundled and exported to shore. The inter-array cables will be buried in the seabed, typically to a depth of 1m, but may range from 0.5m - 3m, and can be buried via several techniques depending on the seabed conditions along the route. These techniques can be ploughing and mechanical cutting, jetting or trenching. Where cable burial is not possible alternative cable protection measures will be used, such as rock placement or mattresses. The type of cable protection to be used will be discussed with relevant stakeholders post consent.

2.1.6 Offshore Substation Platform

63. The current assumption for the Offshore Project is that one offshore substation is required. However, the requirement for an OSP will not be confirmed until detailed design of the Offshore Project has been completed. The location of the offshore substation (if required) will be confirmed during the detailed design process. The footprint plan of the OSP will be in the region of 80m by 50m with a topside height up to 115m. However, it will be located appropriately to optimise the inter-array cable and export cable lengths. At the substation, the generated power will be stepped up to a higher Alternating Current (AC) voltage.

64. The OSP will typically comprise components including, but not limited to:

- High voltage (HV) power transformers
- Batteries
- Generators
- Instrumentation, metering equipment and control systems
- HV Switchgear and busbars
- Fire systems
- Navigation, aviation and safety marking and lighting
- Systems for vessel access and/or retrieval
- Communication systems and control hub facilities
- Modular facilities for operational and maintenance activities

2.1.7 Offshore export cable

65. Electricity from the Windfarm Site will be transmitted via one or two subsea export cable(s) to shore depending on whether an OSP is required. A junction box offshore will bundle the inter-array cables and connect them to the Offshore Export Cable, if there is no OSP. The Offshore Export Cable will then be laid to the Transition Joint Bay or just behind the landfall.

66. The cable will be buried where possible to ensure that the cable is protected from damage by external factors. Typical burial depth is 1m but may range from 0.5m - 3m. If seabed conditions make burial unfeasible, as well as in the immediate proximity of turbine foundations, the cable will be protected by a hard-protective layer such as rock or concrete mattresses.

67. If an OSP is required, the offshore export cable (up to 132kV AC) is likely to run from the OSP to a transition joint bay (TJB) at the Landfall. However, if an OSP is not required, the offshore export cable corridor will run from the point at which inter-array cables are bundled together to the TJB. The TJB connects the offshore cable and onshore export cable. Each offshore export cable will be installed in an individual trench and protected in line with good industry practice.

68. It is likely that the offshore export cable will have to cross other subsea cables. Formal agreements with regards to existing cable crossings will be entered into by OWL and the existing owners / operators. Installation techniques will be discussed and agreed to ensure integrity of the existing infrastructure and any new cables associated with the Offshore Project.

2.1.8 Landfall (up to MHWS)

69. The Offshore Export Cable makes landfall at Saunton Sands. It will involve the installation of a Transition Joint Bay where the offshore and onshore export cables will be connected. Cable installation underneath the Taw-Torridge estuary will be undertaken using trenchless technology, see **Plate 2.1**.

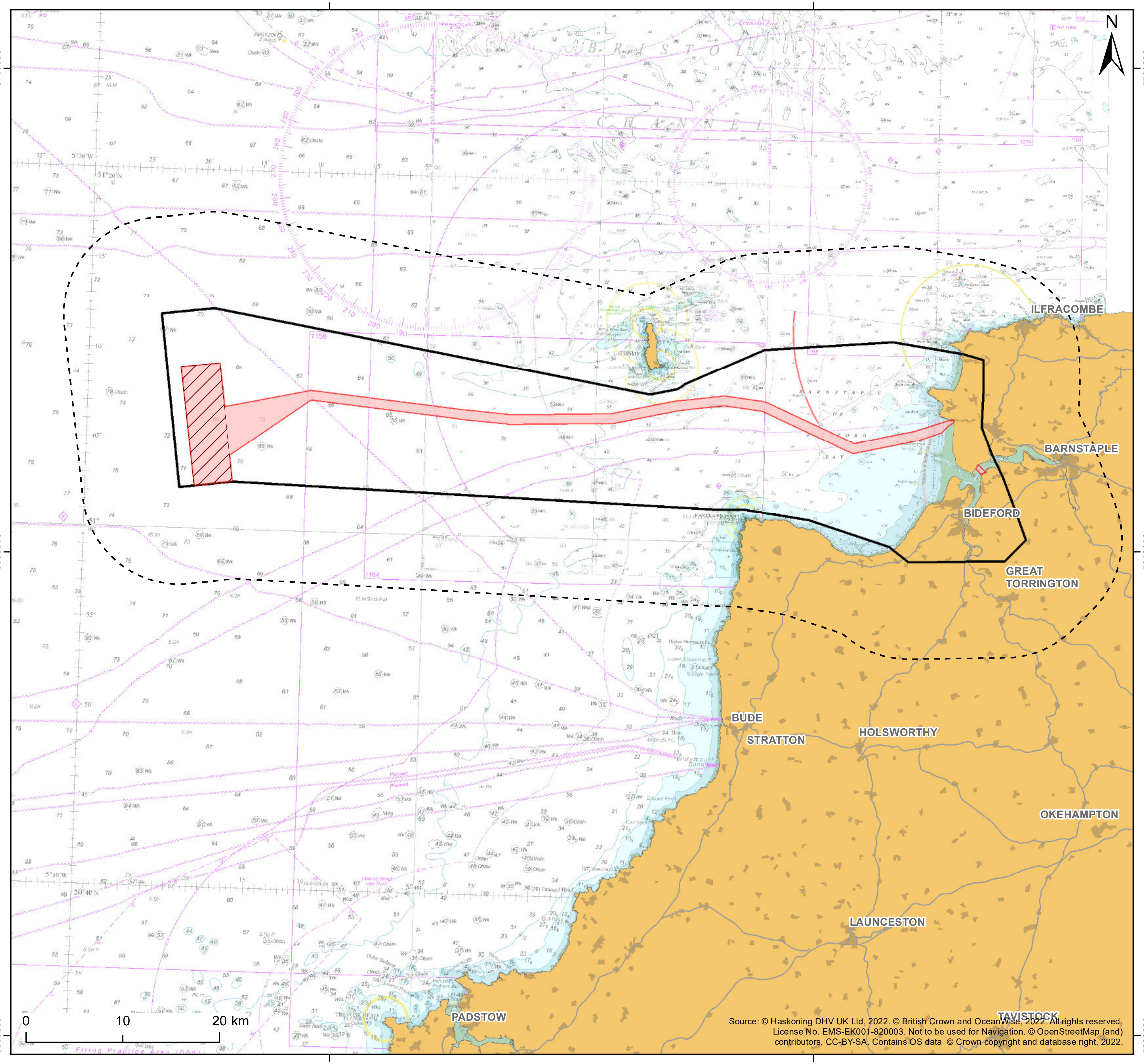
3. Topics Considered in the ES

3.1 Offshore

70. The following sections summarise findings of assessments that have considered the potential effect of the Offshore Project on offshore related receptors.

3.1.1 Marine Geology, Oceanography and Physical Processes

71. For Marine Geology, Oceanography and Physical processes, receptors that may be impacted include locations along the Devon coast such as Braunton Burrows, Taw-Torridge Estuary and Bideford to Foreland Point Marine Conservation Zone, referred to collectively within the report as the sensitive Devon Coast, and Lundy Island. **Figure 3.1** shows the study area used for the assessments.



Legend:
- Windfarm Site
- Area of Search
- Marine geology, oceanography Study Area
- Offshore Development Area

Client:	Project:
Offshore Wind Ltd.	White Cross Offshore Windfarm

Title:

Marine geology, oceanography and physical processes study area

Figure:	8.1	Drawing No:	PC2978-RHD-ZZ-XX-DR-Z-0460		
Revision:	Date:	Drawn:	Checked:	Size:	Scale:
P02	03/03/2023	AB	DB	A3	1:400,000
P01	20/12/2022	JT	DB	A3	1:400,000

Co-ordinate system: WGS 1984 UTM Zone 30N

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72. A desk study was undertaken to obtain information on marine geology, oceanography, and physical processes. Site specific surveys were also undertaken including geophysical surveys (bathymetry and sub-bottom profiling), grab sampling and drop-down video. These surveys were undertaken to gain further data for the shallow geology and seabed characterisation.

73. Cable installation and the effect of vessels on the seabed were assessed as potential construction and decommissioning impacts. For the operation and maintenance phase of the Offshore Project, potential impacts on waves, tidal currents, and sediment due to the presence of the infrastructure and cable protection were considered. Additionally in response to stakeholder concerns, the potential impact on waves affecting surfing conditions at Saunton Sands were considered, wave modelling was carried out to inform the assessment.

74. The geographical extent of the model, the bathymetry, the location of the wind farm, and key nearshore locations are shown in **Figure 3.2**.

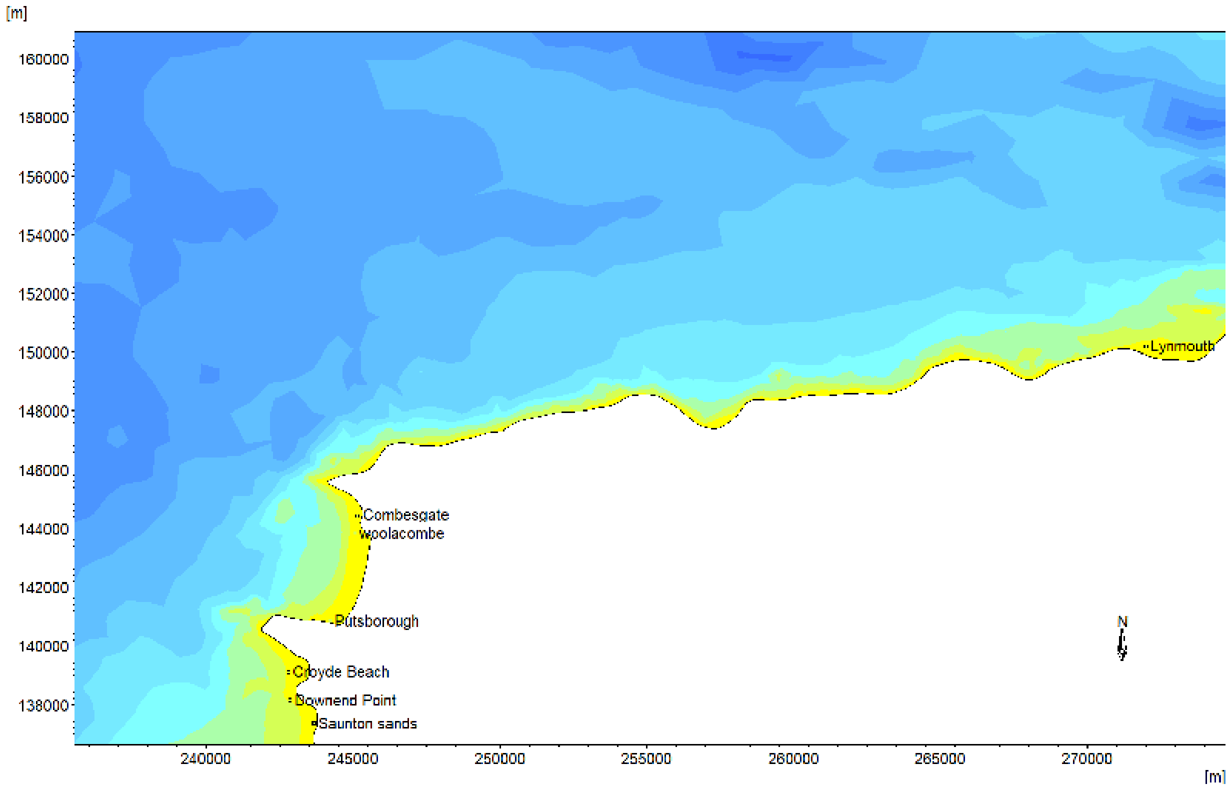


Figure 3.2 Locations considered as part of the wave modelling

75. The results of the assessments (including the numerical modelling of waves) show that there would be no **significant** effects to marine geology, oceanography and physical processes at the key receptors during the construction, operation and maintenance, and decommissioning phases. Therefore, no proposed mitigation measures are necessary, embedded mitigation is described in **Section 8.3.5** of **Chapter 8: Marine Geology, Oceanography and Physical Processes**.

76. No **significant** effects were found when considering cumulative effects with other projects and transboundary impacts.

77. For further information on this topic, please see Chapter 8: Marine Geology, Oceanography and Physical Processes.

3.1.2 Marine Water and Sediment Quality

78. The Marine Water and Sediment Quality study area was defined by the distance over which impacts on water quality from all the offshore project components (i.e. the Windfarm Site, Offshore Export Cable Corridor, Offshore Substation and Landfall) could occur. For the impact assessments existing data sources were used as well as a benthic characterisation survey which was carried out in 2022.

79. The Offshore Project is located within an open coastal area within the outer Bristol Channel (**Figure 1.1**), characterised by low suspended sediment concentrations

and sandy-coarse sediments. Sediment chemical analysis of samples taken from within the Windfarm site and along the potential export cable route show that the sediments are relatively uncontaminated, with only marginal exceedances when compared to guidance values. Data for metals indicated seven samples of exceedances; PAH samples indicated ten samples with marginal exceedances.

80. The same potential impacts were assessed for the construction, operation and maintenance and decommissioning phases of the Offshore Project. The potential impacts included increases in suspended sediment from cable burial and remobilisation of contaminated sediment.

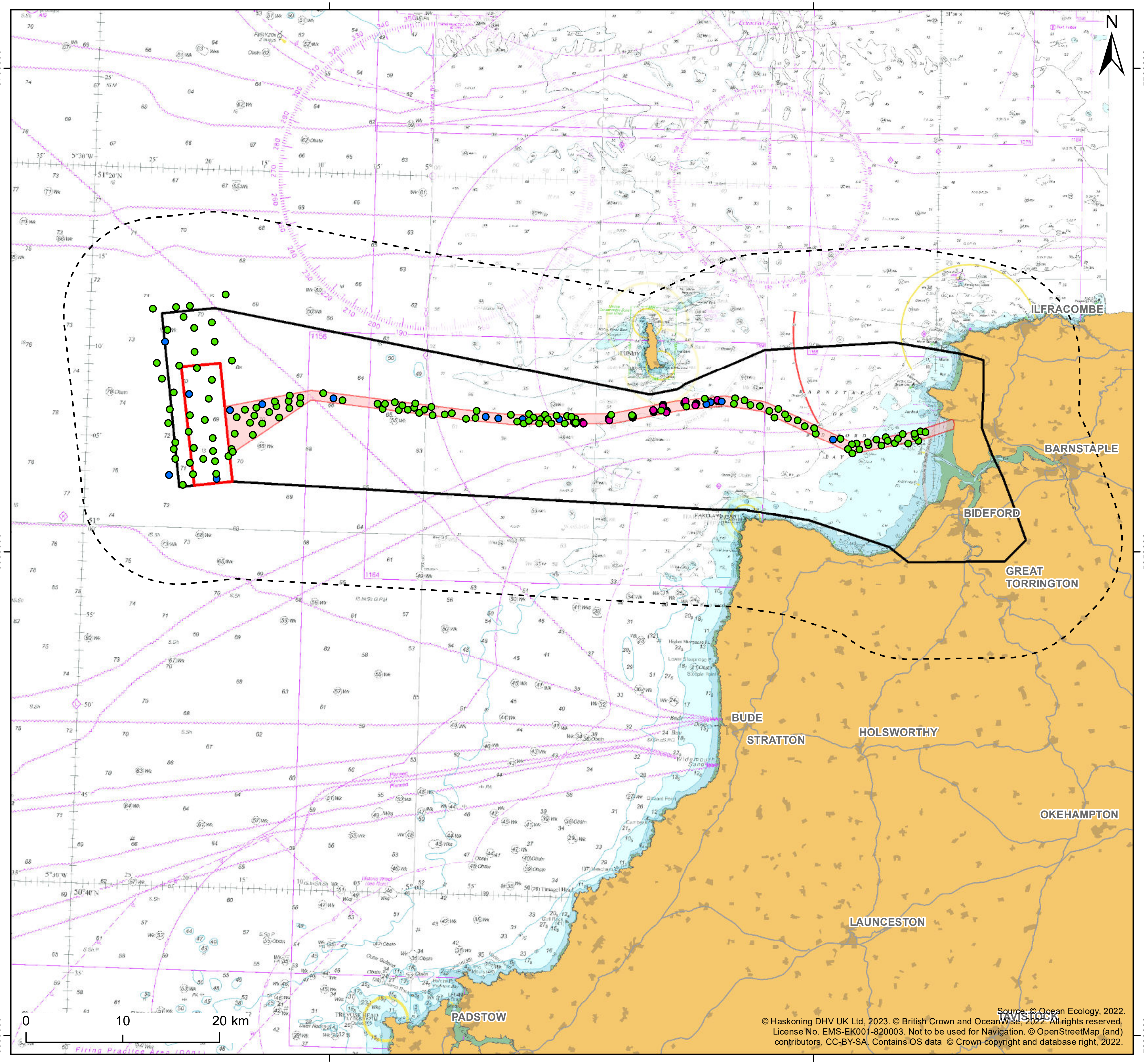
81. No **significant** effects on marine water quality were identified, with all effects assessed as of **negligible** significance. No additional mitigation measures were required, embedded mitigation is described with **Section 9.3.4** in **Chapter 9: Marine Water and Sediment Quality**.

82. As predicted effects on marine water and sediment quality arising from the Offshore Project are **negligible**, cumulative effects between the Offshore Project and other developments would be **negligible**. **No significant** effects were found when undertaking the transboundary assessment.

83. For further information on this topic, please see **Chapter 9: Marine Water and Sediment Quality**.

3.1.3 Benthic and Intertidal Ecology

84. The benthic and intertidal ecology study area consists of a 10km area around the Windfarm Site and the Offshore Export Cable Corridor. For the impact assessments existing data sources were used as well as a benthic characterisation survey which was completed in 2022. The sample stations can be seen in **Figure 3.3**.



Legend:

- White Cross Wind Farm Site
- Area of Search
- Study Area
- Offshore Cable Corridor
- PSD & Macro
- PSD & Macro & Contaminants
- DDV Transects

Client:	Project:
Offshore Wind Ltd.	White Cross Offshore Windfarm

Title:

Benthic and Intertidal Ecology Sample Stations

Figure: 3.3 Drawing No: PC2978-RHD-ZZ-XX-DR-Z-0472

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
P01	09/01/2023	AB	KH	A3	1:400,000

Co-ordinate system: WGS 1984 UTM Zone 30N

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85. Seabed sediments across the Windfarm Site and cable corridor and interconnector, are dominated by sand and mixed sediment. Benthic communities corresponding to these sediment types were recorded, which were consistent with typical communities found throughout the Celtic Sea.

86. Potential construction, operation and maintenance, and decommissioning impacts considered within the assessments were:

- Temporary habitat loss/ disturbance
- Permanent habitat loss/ long term habitat loss
- Increased suspended sediment
- Remobilisation of contaminated sediment
- Underwater noise and vibration
- Invasive Non Native Species (INNS)
- Electromagnetic Frequency (EMF)

87. The assessment has established that any residual effects during the construction, operation and maintenance, and decommissioning phases of the Offshore Project will be **not significant** to **minor adverse**. Effects will be generally localised in nature, being restricted to the Offshore Windfarm Site and immediate surrounding area.

88. There is a lack of research identifying the potential effects of underwater noise and EMF effects on benthic ecology. The biotopes identified over the Offshore Development Area have MarESA sensitivity of 'Not Relevant' to the impact of EMF, therefore the potential effect is considered to be **negligible**. However, mitigation for EMF effects have been proposed which include using armoured cables and cables will be buried where possible, both reduce the magnetic fields.

89. The potential effect of INNS during construction and decommissioning was assessed as **minor adverse**. Mitigation measures for INNS include biosecurity measures in line with relevant regulations and guidelines. With this mitigation in place, assessments identified there would be no residual effect from INNS.

90. The assessment of cumulative effects from the Offshore Project and other developments and activities concluded that due to the distance of all the projects listed within the area, all other projects have been screened out of the cumulative assessment. Any impacts across the region will be small scale and localised with no pathway for cumulative effects on benthic ecology. There is no potential for transboundary impacts.

91. For further information on this topic, please see **Chapter 10: Benthic and Intertidal Ecology.**

3.1.4 Fish and Shellfish Ecology

92. The Fish and Shellfish Ecology Study Area has been defined using International Council for the Exploration of the Seas (ICES) Rectangles. This area comprises 8,002km² of marine environment. The Fish and Shellfish Ecology Study Area used is the southern section of the outer Bristol Channel. The area extends seaward (west) from the Devon coastline, at the mouth of the rivers Taw and Torridge, and encompasses Bideford Bay and Lundy Island. This chapter used desktop reviews of existing studies and datasets as well as data from site specific surveys to inform the assessments.

93. A variety of commercially and ecologically important fish and shellfish species are present across the area, which have been classified into elasmobranch, demersal, pelagic, migratory fish species and shellfish receptor groups. Some regions of the array area and Export Cable Corridor have the potential to act as spawning and nursery grounds for a range of species across receptor groups.

94. **No significant** effects on fish and shellfish ecology were identified, with all effects assessed as of **negligible** residual effect. This was due to the small, localised scale of the effects in comparison to the size of the spawning and nursery areas. Also due to the **low** to **medium** sensitivity of species and habitats. No further mitigation is required, details on embedded mitigation is found in **Section 11.3.4** in **Chapter 11: Fish and Shellfish**.

95. The assessment of cumulative effects from the Offshore Project and other developments and activities concluded that as predicted residual effects arising from the Offshore Project are **negligible**, cumulative effects with other developments would be **negligible** and **minor adverse**.

96. The screening of transboundary impacts identified that there was **no potential for significant** transboundary effects regarding fish and shellfish impacts from the Offshore Project.

97. For further information on this topic, please see **Chapter 11: Fish and Shellfish Ecology.**

3.1.5 Marine Mammal and Marine Turtle Ecology

98. The Study Area for marine mammals and marine turtles has been defined on the basis that marine mammals and marine turtles are highly mobile and transitory in nature. Therefore, it was necessary to examine species occurrence not only within the Offshore Project area, but also over the wider area, based on their relevant Management Units. Management Units are geographical areas in which the animals of a particular species are found, to which management of human activities is applied. The study area can be seen in **Figure 3.4**.

Figure 3.4 Marine Mammal and Marine Turtle study area

99. To carry out the assessments, existing studies and datasets were used as well as site-specific surveys. APEM Ltd collected high resolution aerial photography for marine megafauna (and bird species) over the windfarm site, including a 4km buffer. The aerial surveys were conducted over a 24 month period between July 2020 and June 2022. To model noise from Unexploded Ordnance (UXO) clearance, an approach based on equations from Soloway and Dahl (2014) has been used. For impact piling, Subacoustech's INSPIRE underwater noise model has been used.

100. Key species included within the impact assessments are harbour porpoise, bottlenose dolphin, striped dolphin, common dolphin, minke whale, grey seal and leatherback turtle.

101. Potential effects during construction, operation and maintenance, and decommissioning assessed for marine mammals and marine turtles are:

- Underwater noise effects from foundation installation (piling); UXO clearance; other activities such as cable laying and rock placement; foundation and cable removal; operation and maintenance activities.
- Underwater noise, disturbance, interactions, and collision risk from vessels.
- Disturbance at seal haul out sites.
- Entanglement.
- Electromagnetic fields direct and indirect effects.
- Barrier effects from the physical presence of the windfarm and underwater noise.
- Changes to prey availability and water quality.

102. For all the potential effects assessed the residual effect outcomes were **negligible** to **minor adverse** effects. To get to this conclusion the assessments considered potential impact ranges for each species and type of activity, and population density estimates for each species. Existing information and case studies are used to inform assessments, especially for the likely behavioural responses of species is also used to inform assessments.

103. A Marine Mammal Mitigation Protocol (MMMP) will be produced for piling activities and UXO clearance. The MMMP details proposed mitigation measures to reduce the risk of any physical or Permanent Threshold Shift (PTS) to marine mammals and marine turtles during all piling operations and UXO clearance. One example of mitigation is the use of Acoustic Deterrent Devices prior to piling or UXO activity. A Site Integrity Plan for the Bristol Channel Approaches SAC (solely designated for harbour porpoise) will be developed. The SIP will set out the approach to deliver any mitigation or management measures to reduce the potential of disturbance of

harbour porpoise in relation to the Bristol Channel Approaches SAC conservation objectives.

104. Best practice guidance will be followed for reducing the vessel collision risk with marine mammals due to the potential **minor adverse** effect. Monitoring requirements will also be detailed for entanglement risks. Mitigation measures will be agreed with the MMO and NE before construction. Further detail on embedded mitigation is described in **Section 12.4.4.1** of **Chapter 12: Marine Mammal and Marine Turtle Ecology.**

105. Cumulative effect assessments are also carried out in order to assess potential effects associated with the proposed project and other activities/ projects occurring at the same time. Potential underwater noise, vessel collision risks, entanglement and changes to prey availability impacts were also assessed for potential cumulative effects. No potential cumulative effects were assessed as significant. The potential for transboundary impacts were assessed with the cumulative effects.

106. For further information on this topic, please see Chapter 12 Marine Mammal and Marine Turtle Ecology.

3.1.6 Offshore Ornithology

107. The offshore ornithology study area was defined on the basis of the aerial survey study area, which covers the windfarm site, as well as 4km buffer around it. In order to gather site-specific and up-to-date information, aerial surveys capturing high-resolution photography were undertaken monthly from July 2020 and concluded in June 2022. Imagery was used to assess the abundance and distribution of offshore bird species within the study area. Information on species distribution, flight height and flight direction was also recorded.

108. In addition to the aerial survey, a desk study considering all known and relevant literature has been undertaken to ensure a comprehensive baseline has been used for the assessment.

109. Potential impacts considered within the Offshore Ornithology assessments are:

- Disturbance, displacement covering work activity, vessel movements and lighting, as well as barrier effects due to presence of turbines and infrastructure
- Indirect effects through effects on habitats and prey species
- Collision risk
- Entanglement with mooring lines
- Cumulative impacts
- Transboundary impacts.

110. Species included within assessments are Kittiwake; Great black-backed gull; Common gull; Herring gull; Lesser black-backed gull; Sandwich tern; Common tern; Great skua; Guillemot; Razorbill; Puffin; Fulmar; Manx shearwater; and Gannet.

111. There are currently no known other proposed developments within close proximity likely to influence the Offshore Project's offshore study area. In the absence of significant local impacts, it is likely that the populations of bird species present will evolve in accordance with regional and national trends.

112. However, it is acknowledged that there has been reported bird mortality from Highly Pathogenic Avian Influenza during the 2022 breeding season, which has caused impacts that have varied considerably between species and colonies. At present, it is uncertain what the wider population effects are for individual species. However, as determined by a recent Natural England recommendation, as the baseline data for the Offshore Project were collected prior to the current outbreak of Bird Flu. The assessments within this report remain a valid representation of typical seabird distribution and density.

113. The Offshore Ornithology assessments indicated all potential effects on species had **no significant** effect, all impacts were assessed as **negligible** to **minor**. The assessments came to these conclusions due to the low magnitude of potential impacts.

114. Further details for the embedded mitigation measures are found in **Section 13.6** of **Chapter 13: Offshore Ornithology.**

115. When assessing the impact of this Offshore Project in combination with the effects of other projects and developments being undertaken within the area, results suggested there would be **no significant** effects. Therefore, no additional mitigation has been proposed.

116. Transboundary impacts upon offshore ornithological receptors are possible due to the wide foraging and migratory ranges of typical bird species in the Celtic Sea. In particular, there is potential for transboundary collisions and displacement. In Irish waters, including the operational Arklow Bank offshore windfarm. It is likely that there will be temporal overlap within the operational phases of at least some of these Irish offshore renewable energy projects. However, consideration of potential transboundary effects is limited by the data available. The age of Arklow Bank means that it lacks a comparable dataset upon which to base assessment. Furthermore, those developments have not released their data into the public domain, and there is a high degree of uncertainty regarding consent.

117. During the breeding bio-season, it is highly unlikely that even those key receptors with relatively large mean-maximum foraging ranges such as gannet will travel

further than the Celtic and Irish Seas. Therefore, developments outside of UK and Irish waters will not contribute significantly to any transboundary effects.

118. During the non-breeding bio-season, key receptors are able to travel more widely. Given this larger spatial scale, any potential transboundary effects would be in relation to much larger populations than those considered at the UK-scale. Therefore, it is apparent that the scale of development within such a wide context would be relatively smaller with respect to any potential impacts considered at the UK scale.

119. For further information on this topic, please see **Chapter 13: Offshore Ornithology.**

3.1.7 Commercial Fisheries

120. The Commercial Fisheries Study Area has been defined with reference to the ICES rectangles in which the Offshore Project Area is located. This chapter used existing datasets and studies to inform the assessments.

121. The potential impacts specific to commercial fisheries to be assessed below are:

- Reduction in access to, or exclusion from established fishing grounds
- Displacement leading to gear conflicts and increased fishing pressure on adjacent grounds
- Increased steaming distances and times to fishing grounds
- Interference with fishing activities
- Obstructions on the seabed
- Adverse impacts on commercially exploited species.

122. The evidence indicates that, overall, the Offshore Project is located in an area with low levels of fishing activity in comparison to other areas in the regional, national and international contexts. Activity that does occur within the immediate vicinity of the Offshore Project, is mainly made up by Belgian vessels, almost entirely beam trawlers, followed by UK vessels. Activity by other nationalities (France, Ireland and Holland) in the Offshore Project area, appears to be minimal.

123. Activity from UK vessels, within close proximity to the Offshore Project, mainly consist of small local vessels (under 10m) deploying a number of gears, often being from potting. From direct consultation with local stakeholders, it is understood that the majority of these vessels are within the UK's 12-mile limit, so are therefore more relevant to impacts associated with the export cable corridor rather than the windfarm site itself.

124. During consultation with local fisheries stakeholders, the main focus of their concerns were potential loss of fishing area and associated displacement effects.

125. Due to the location and small size of the Offshore Project relative to fishing grounds, at a national fleet level, none of the potential impacts would be at levels of significance that would require mitigation. At the local level however, there are a small number of local vessels whose static gears would require relocation from the export cable corridor during the installation phases of the export cable. In the case of these vessels, the appropriate evidence-based cooperation agreements would be sought with the relevant vessel's owners to appropriately mitigate the potential impact.

126. Further detail of the embedded mitigation is described in **Section 14.3.4** of **Chapter 14: Commercial Fisheries**.

127. When assessing the impact of this Offshore Project in combination with the effects of other projects and developments being undertaken within the area, results suggested there would be **no significant effects**.

128. For further information on this topic, please see **Chapter 14: Commercial Fisheries.**

3.1.8 Shipping and Navigation

129. The study area for shipping and navigation was defined as an area 10nm from the Windfarm Site and 3nm from offshore export cable. Existing data was gathered through a desktop review of studies and datasets, data was also acquired through a vessel survey.

130. The export cable route will make landfall near to the entrance of the River Torridge, where a pilot boarding station and harbour are located. Search and rescue assets are located along both the Welsh and Cornish/Devon coastlines, with a Search and Rescue (SAR) helicopter stationed at Newquay.

131. Analysis determined that the dominant shipping routes within the Celtic Sea are from Land's End, due north to the Irish Sea (15nm from the Offshore Project), and from Land's End to the Bristol Channel (8.2nm from the Offshore Project). The Windfarm Site is clear of both routes.

132. The Windfarm Site is adjacent to a shipping route, that passes north of Lundy (565 transits per year). A route taken by tankers between Milford Haven and Land's End passes two nautical miles to the northwest (521 transits per year). No passenger services are located near to the windfarm site. However, regular services operate between the mainland and Lundy which intersect the export cable corridor.

133. The majority of recreational movements are offshore cruising yachts. These activities are concentrated along the coast and towards the cable landfall. There is

seasonality in vessel activity, concentrated between April and September, related to fishing and recreational movements.

134. Static and mobile gear fishing takes place both within the Windfarm Site, and in close proximity of the Export Cable Corridor. These include both local UK boats and European vessels. Some trawling and potting activity was evident from the analysis near to the cable landfalls.

135. Historical incident analysis within 10nm of the windfarm site identified very few incidents, and no collision occurrences. Most incidents relate to the effects of adverse weather or mechanical failure. Near to the cable landfalls, a greater number of incidents were recorded correlating with an increase in recreational activity.

136. Assessment of the impacts throughout the Offshore project lifecycle has established that while there will be some residual effects, they are **not** considered **significant**. The windfarm site is located in an area of low vessel intensity and is not predicted to have an appreciable impact on vessel routes and no appreciable increase in collision risk is anticipated.

137. Floating WTGs are typically moored to the seabed through a spread of subsurface mooring cables and chains. The cable and mooring lines can pose a risk to navigating vessels through a reduction in under keel clearance or snagging. Snagging by fishing gear could, in a worst-case event result in capsize and therefore sufficient burial of the cable is recommended where possible. In both instances the frequency of occurrence was considered unlikely. With embedded mitigation in place (further details in **Section 15.3.4** of **Chapter 15: Shipping and Navigation**), both hazards were assessed as **not significant** in EIA terms.

138. The assessment of cumulative effects from the Offshore Project and other developments and activities concluded that cumulative projects would deviate shipping bound for Milford Haven to the west, therefore, away from the Offshore Project. The contribution of the Offshore Project to cumulative effects is **negligible**, with the presence of the cumulative projects likely to reduce impacts at the Offshore Project. In all instances the frequency of occurrence was considered unlikely. With the assumed embedded mitigation in place, all cumulative hazards were assessed to be **not significant** in EIA terms.

139. Given the international nature of shipping and navigation transboundary impacts are possible. These are assessed in terms of impacts to international shipping routes. Effects to vessel routeing were assessed within the impact assessment which determined that impacts to vessel routeing are **negligible**.

140. For further information on this topic, please see **Chapter 15: Shipping and Navigation.**

3.1.9 Marine Archaeology and Cultural Heritage

141. The study area for Marine Archaeology and Cultural Heritage considered the Windfarm Site and Offshore Export Cable Corridor including the intertidal zone up to MHWS. In order to provide site specific and up to date information on which to base the impact assessment, a geophysical site characterisation survey was conducted across the Offshore Development Area. This was conducted between May and August 2022. In addition to the site-specific surveys, existing data and sources were also used to inform assessments.

142. A total of 60 seabed features have been identified within the Offshore Development Area (including the 500m buffer). Of these features two have been interpreted as being of high archaeological potential, three of medium archaeological potential and 55 of low archaeological potential.

143. A total of 583 magnetic anomalies have been identified across the Offshore Development Area. Of these, 541 do not relate to identified archaeological anomalies or known infrastructure. The nearshore magnetic anomalies are likely to be associated with the US Assault Training Centre. This is the only Historic Environment record within the intertidal zone.

144. In addition to the identified anomalies described above, there is also potential for the presence of further maritime and aviation archaeological material to be present, which has not been identified in the geophysical data. This may comprise isolated finds of material, or wrecks or aircraft crash sites, potentially buried and concealed within or beneath marine seabed sediments. Within the Offshore Development Area there are four United Kingdom Hydrographic Office records, two within the Windfarm Site and two within the Offshore Cable Corridor. Three of the records are recorded as foul ground, while the other is known as wreck WC22_0063.

145. With the application of mitigation measures, it is anticipated that all direct impacts to known heritage assets resulting from the Offshore Project will be avoided. Further details of embedded mitigation is described in **Section 16.3.7** of **Chapter 16: Marine Archaeology and Cultural Heritage**. The proposed approach to delivering embedded mitigation will be set out in the offshore Outline Written Scheme of Investigation.

146. It is not possible to avoid heritage assets that have not yet been discovered (potential heritage assets). To minimise this potential impact, further archaeological assessment of high-resolution geophysical data and geoarchaeological assessment of geotechnical data will be undertaken post-application/ post-consent. This will reduce, as far as possible, the potential for unintended impacts during construction. In the event of an unexpected discovery, this will be reported using a formal protocol for archaeological discoveries which will establish whether the recovered objects are

of archaeological interest and recommend appropriate mitigation measures where necessary.

147. Potentially beneficial effects have also been identified in relation to cumulative effects through the contribution of data to academic and scientific objectives, and public outreach and engagement. The approach to delivering these objectives will be established post-consent in consultation with key stakeholders, including Historic England, and are set out in the Outline WSI. Transboundary effects will not occur due to the localised nature of disturbance.

148. For further information on this topic, please see Chapter 16: Marine Archaeology and Cultural Heritage.

3.1.10 Civil and Military Aviation

149. The Civil and Military Aviation study area was defined by aviation flight operations and the location of any receptors that may be affected by potential impacts. The study area encapsulates the Windfarm Site and, for the purposes of the assessment of cumulative effects the buffer distances for direct and indirect aviation effects are 70km and 100km respectively.

150. A desktop study was undertaken to obtain information on Civil and Military Aviation. No site-specific surveys were undertaken. Effects included for assessments were:

- Creation of physical obstacle to low level aircraft operations
- Wind turbines causing interference on civil and military primary surveillance radar systems.

151. Overall, the sensitivity of the receptors is considered to be **low**, and the magnitude of effects is deemed to be **low**. The effect will, therefore, be of **minor** to **negligible** significance for all scenarios, which is **not significant** in EIA terms.

152. The Applicant has and will continue to engage with the MoD prior to and during the application process and will continue this engagement and seek to identify agreed mitigation for the Air Defence Radar (ADR) system where required. The assumption that suitable mitigation would be agreed with the MoD reduces the negative effect (magnitude of effect) created by the Offshore Project to **minor**, below effect significance in EIA terms.

153. The assessment of cumulative effects from the Offshore Project and other developments and activities concluded the creation of cumulative physical obstacles to aircraft operations would not significantly increase the **minor adverse** assessment for the Offshore Project in isolation. It was also concluded that wind turbines causing interference on MoD Primary Surveillance Radar, and ADR systems

would not significantly increase the moderate adverse assessment for the Offshore Project in isolation.

154. The screening of transboundary impacts identified that there was no potential for significant transboundary effects regarding Civil and Military Aviation from the Offshore Project upon the interests of other European Economic Area States.

155. For further information on this topic, please see **Chapter 17: Civil and Military Aviation.**

3.1.11 Infrastructure and Other Users

156. When identifying the Infrastructure and Other Users study area, it was shown direct overlap of activities was limited to the windfarm site and a 15km buffer. The study area was then extended to 50km zone of influence for other indirect effects and allows for interaction with a wide range of other users, both offshore and onshore. A desk study was undertaken to obtain information on infrastructure and other users.

157. There are three known offshore windfarms and one wave project within 50km of the Offshore Project. There are no operational offshore windfarms located within 50km of the Offshore Project. There was however, one operational onshore wind turbine located on Lundy Island.

158. The Government has set an ambition to deliver up to 5 GW of floating wind by 2030, with rapid expansion anticipated thereafter. To support this, TCE is offering new leasing opportunities in the Celtic Sea for the first generation of commercial-scale floating offshore windfarms – unlocking up to 4 GW of new clean energy capacity between 2030 and 2035. TCE is developing a phased approach to provide opportunities for growth and investment and to facilitate the co-ordination of the necessary infrastructure, such as ports and grid connections into the long term.

159. Interactions with the other renewable projects could arise from:

- Navigation safety issues
- Aviation (i.e. helicopter operations)
- Cumulative issues relating to other users (e.g. recreational boating)
- Overlap of infrastructure and potential interactions during construction, operation and maintenance, and decommissioning
- Increased pressure on port facilities.

160. Issues arising from navigational safety and aviation are assessed in **Chapter 15: Shipping and Navigation** and **Chapter 17: Civil and Military Aviation** respectively. Issues arising from the effect on commercial fisheries, including

cumulative effects, are considered and assessed in **Chapter 14: Commercial Fisheries**.

161. There will not be a spatial overlap of the Offshore Project with the other projects. There is no oil or gas infrastructure located within the Offshore Project study area. However, there is one historical exploratory wellhead located approximately 18km north west of the Offshore Project boundary. There are also currently three operational telecommunications cables that cross the Offshore Project. There are currently no operational disposal areas located within the Offshore Project boundary, but there are 9 disposal areas located within the 50km study area buffer. However, of these 9 disposal sites only 3 of them are open.

162. Practice and Exercise Areas (PEXAs) are designated areas which are used for training and defence purposes by the Royal Navy, the Army, the Royal Air Force (RAF) and the MoD. The Offshore Project area overlaps with the South West MDA (C) and is in close proximity to the Braunton Burrows danger PEXA which is used for amphibious landing practice. Onshore, the MoD also use Braunton Burrows for Firing and Demolition Firing.

163. There is also the potential for wartime UXO within the Celtic Sea. Locations of any UXO would be determined post-consent and mitigation agreed in consultation with NE and the MMO.

164. The assessments have established that the residual effects on infrastructure and other users during the construction, operation and maintenance, and decommissioning phases of the Offshore Project are considered '**minor adverse**' or '**negligible**'. No further mitigation is required, however further detail for embedded mitigation is provided in **Section 18.3.4** of **Chapter 18: Infrastructure and Other Users.** The assessment of cumulative effects from the Offshore Project and other developments and activities concluded that the cumulative effects of other projects would be no greater than the Offshore Project alone. There are no potential transboundary effects.

165. For further information on this topic, please see **Chapter 18: Infrastructure and Other Users.**

3.1.12 Offshore Seascape, Landscape and Visual Amenity

166. The Windfarm Site is located approximately 52 km from the mainland north Cornwall and Devon coastline, and approximately 43 km from Lundy Island. The Pembrokeshire coastline lies approximately 54 km to the north-east.

167. The Offshore Seascape, Landscape and Visual Amenity (SLVIA) study area includes the seascapes of the Celtic Sea; to the north are the coastal waters off South Pembrokeshire; to the east is the Bristol Channel; to the south-east are the coastal

waters off north Devon and Bideford Bay; and, to the south area the coastal waters off North Cornwall, from Hartland Point to Trevose Head. The study area can be seen in **Figure 3.5.**

Figure 3.5 SLVIA Study area

168. **No significant** adverse impacts have been identified on the landscape, landscape planning designations, or visual amenity resource within the SLVIA study area. The study area is made up of Marine Character Areas (MCA), these highlight the key natural, cultural and perceptual influences that make the character of each seascape distinct and unique. MCAs have been assessed individually. A **moderate significant** adverse effect has been identified within limited parts of MCA 51: Bristol Channel Approaches and MCA 43: Lundy and Outer Bristol Channel, when considering effects within 20km of the Offshore Project.

169. Non-significant effects have been assessed for all remaining receptors, including:

- MCAs within English and Welsh waters within the study area
- Lundy Island
- The Pembrokeshire Coast National Park (PCNP)
- Viewpoints on the Pembrokeshire Coast Path and Southwest Coast Path
- The North Devon Coast Area of Outstanding Natural Beauty (NDCAONB)
- The Cornwall Area of Outstanding Natural Beauty (COANB).

170. It is considered that the Windfarm Site avoids compromising the purposes of the PCNP, NDCAONB, and CAONB designations, even though it may be visible from within these designated landscapes (in periods of excellent visibility) and that it may impact certain Special Qualities. The natural beauty of the PCNP, NDCAONB, and COANB will remain, and opportunities will still be present for understanding and enjoyment of their Special Qualities.

171. No mitigation is required, however further detail for embedded mitigation is provided in **Section 19.3.4** of **Chapter 19: Offshore Seascape, Landscape and Visual Amenity**.

172. It has been assessed that there would be **no significant** cumulative effects as a result of the addition of the Offshore Project to a context containing operational, under construction, consented, application or scoping stage cumulative development. There are no potential transboundary effects.

173. For further information on this topic, please see Chapter 19 Offshore Seascape, Landscape and Visual Amenity.

3.2 Project Wide Impact

174. The following sections summarise findings of assessments that have considered the potential effect of the Offshore Project on onshore related receptors.

3.2.1 Onshore Ecology and Ornithology

175. The Onshore Ecology and Ornithology study area was defined by the distance over which impacts on ecology and ornithology from all the Offshore Project components may occur and by the location of any receptors that may be affected by those potential impacts.

176. To inform the EIA, site-specific surveys were undertaken over the course of 2022:

- Habitat Survey
- Great crested newt presence / absence survey
- Breeding bird survey
- Water vole and otter survey
- Invertebrate survey
- Aquatic flora survey

177. Designated sites with key habitats and species included in assessments are:

- Braunton Burrows Site of Special Scientific Interest (SSSI) and SAC
- Intertidal sandflats, dune, dune grasslands and supported species.
- Taw-Torridge Estuary SSSI
- intertidal mudflats and sandflats, estuary, and supported species.
- Bideford to Foreland Point MCZ
- A range if intertidal habitats and supported species
- Northam Burrows SSSI
- 'Yellow' dunes, wet grassland, dune slack, extensive coastal grassland and overwintering and migratory birds

178. The survey found the following species in the study area that are relevant to the Offshore Project:

- Otter (around the Taw Estuary crossing (between MHWS on the northern edge to MHWS on the southern edge))
- Breeding birds (a range of Schedule 1, and Amber and Red List recorded)
- Non-breeding birds (a range of Schedule 1, and Amber and Red List recorded)
- Amphibians (though no great-crested newts near to the landfall and Taw Estuary crossing (between MHWS on the northern edge to MHWS on the southern edge))

179. During the construction, and the operational and maintenance phases a potential moderate adverse effect was predicted as a result of the introduction of invasive species on plant and machinery. However, mitigation measures such as strict adherence to relevant good practice and monitoring is expected to prevent this impact occurring. No effect would therefore arise. All other potential effects were assessed as having no effect to **minor adverse**. For further information on the embedded mitigation measures please see **Section 20.3.7** of **Chapter 20: Onshore Ecology and Ornithology.**

180. The assessment of cumulative effects from the Project and other developments and activities concluded that the majority of effects would remain as **not significant**.

181. The Scoping Report identified that there was no potential for significant transboundary effects.

182. For further information on this topic, please see **Chapter 20: Onshore Ecology and Ornithology.**

3.2.2 Noise and Vibration

183. The assessment of construction noise effects extends to noise and vibration sensitive receptors which are no further than 300m from the Offshore Project. A desk study was undertaken to obtain information on noise and vibration. Data were acquired within the study area through a detailed desktop review of existing studies and datasets. These data sources included Google Maps aerial photography; Environment Agency Lidar topographical data; Local Authority Local Plans and Ordnance Survey mapping.

184. The potential for noise and vibration impacts of the Offshore Project on offshore human noise and vibration sensitive receptors is considered **negligible** and therefore is scoped out of this assessment. The only potential noise and vibration impact of the Offshore Project on onshore human noise and vibration sensitive receptors is associated with landfall and nearshore construction works. These are assessed in the Onshore ES; hence, all Project noise and vibration impacts are scoped out of this assessment. No further mitigation is required, more details on embedded mitigation are provided in **Section 21.3.4** of **Chapter 21: Noise and Vibration**.

185. As the noise and vibration impacts are scoped out, an assessment of cumulative effects from the Offshore Project and other developments and activities has not been undertaken. There is no potential for transboundary effects.

186. For further information on this topic, please see **Chapter 21: Noise and Vibration.**

3.2.3 Traffic and Transport

187. The Offshore Project components by definition would require deliveries to be transported offshore from a base port(s). For the operational and maintenance phase, the base port could potentially be located anywhere on the west or south west coast of the United Kingdom (UK), whilst for the construction/ decommissioning phases the base port(s) could be located anywhere along the coast of the UK or Continental Europe.

188. Due to the scale of most windfarm components, they would need to be delivered to the base port(s) by sea. Terrestrial traffic would therefore likely be limited to personnel vehicles and delivery of small components.

189. The maximum magnitude of traffic effects would likely occur at the base port location and the immediate locality. The level of demand could be managed to ensure that traffic impacts were not concentrated and could be accommodated with the port transport environment. Therefore, it is forecast that any residual transport effects would **not be significant**.

190. It is the Applicant's position that they will not be able to confirm which port(s) will be used for each of the Offshore Project phases until post-consent and therefore no further meaningful assessment of traffic and transport impacts can be presented at this stage. Furthermore, any attempt to assume or identify a location could compromise commercial negotiations.

191. This approach to scoping out the terrestrial traffic and transport impacts of the Offshore Project has been agreed with the Devon County Council who are the local highway authority. This has also been accepted for other recently consented offshore windfarm projects.

192. For further information on this topic, please see **Chapter 22: Traffic and Transport.**

3.2.4 Socio-Economics (Including Tourism and Recreation)

193. The socio-economics, tourism and recreation study area was defined with reference to the impacts on socio-economics, tourism and recreation from all the offshore components associated with the Offshore Project and any receptors that may be affected by those potential impacts. Assessments used existing studies and datasets for information.

194. The Offshore Project has an impact on the social economy, tourism and recreation of Torridge, North Devon and the UK. Torridge and North Devon have a more imbalanced population structure than the rest of the UK, with a larger share of

people aged 65 years old and above. These trends are set to increase in the future, which points to the importance to attract job opportunities.

195. In addition to supporting population retention and attraction, the economic opportunities associated with offshore wind could support an increase in the salaries across Torridge and North Devon. The average salaries in these two areas are currently lower than the UK average.

196. The assessments did not identify any significant impacts. No mitigation measures are required. The assessment of cumulative effects from the Offshore Project and other developments and activities concluded that activity associated with construction and development and the operations of multiple offshore wind sites could lead to further beneficial effects. There is no potential for transboundary effects. This is expected to happen through the development of local supply chains facilitated by the existence of a pipeline of offshore wind projects.

197. For further information on this topic, please see Chapter 23: Socio-Economics (Including Tourism and Recreation).

3.2.5 Human Health

198. The assessment of Human Health uses study areas to broadly define representative population groups, relevant to determining sensitivity, rather than to set boundaries on the extent of potential effects.

199. A desk study was undertaken to obtain information on human health. Data were acquired within the study area through a detailed desktop review of existing studies and datasets. Existing baseline statistics were obtained from publicly available data, such as from the Office of National Statistics and Public Health England and other publicly available sources, to provide information on population health (both general and vulnerable groups) in the study area.

200. Potential impacts considered within this assessment included the effect on open spaces for leisure, and community safety, for construction, operation and maintenance, and decommissioning phases of the Offshore Project.

201. Through assessments it was found that there were **no significant** impacts for human health. The assessment of cumulative effects from the Offshore Project, and its embedded mitigation, and other developments and activities concluded that effects would be **negligible** for the general population. For relevant vulnerable groups, combined proximity and increased sensitivity may result in a **minor** significant adverse effect (**not significant**). The screening of transboundary impacts was not required.

202. Embedded mitigation details are found in **Section 24.3.6**. For further information on this topic, please see **Chapter 24: Human Health.**

3.2.6 Climate Change

203. The study area was defined both geographically, as the asset project area, and by the processes that create the offshore windfarm (i.e. construction), and its operation and maintenance and decommissioning. The assessments were informed by existing studies and datasets.

204. As part of the environmental impact assessment, the effects on climate change in relation to this Offshore Project have been assessed. The assessments focus on how the Offshore Project may impact climate change as well as how climate change effects may impact the infrastructure and design over the lifespan of the Offshore Project.

205. Assessments considered greenhouse gas emissions for the construction, operation and maintenance, and decommissioning phases of the project. These assessments indicated **no significant** impacts were found. In terms of Greenhouse Gas (GHG) emissions for construction, operation and maintenance, and decommissioning, the assessment found this to have beneficial significance. Therefore, no mitigation is required, further details for embedded mitigation is provided in **Section 25.3.6** in **Chapter 25: Climate Change**. The level of GHG savings over the lifespan of the Offshore Project would be approximately 4.2 million tonnes of CO_2.

206. The assessment of cumulative effects from the Offshore Project and other developments and activities concluded that there would be no effects to other developments. As the GHG emissions are assessed in context of the UK Carbon Budgets and the aspirations to reduce GHG emissions in line with Climate Agreements, the cumulative transboundary effects of GHGs emitted by the Offshore Project and Onshore Project are not considered to require specific consideration.

207. For further information on this topic, please see **Chapter 25: Climate Change.**

3.2.7 Accidents and Disasters

208. The major accidents and disasters study area was defined by the distance over which impacts on identified receptors from all offshore infrastructure (i.e. Windfarm Site, Offshore Substation, Offshore Export Cable Corridor, Landfall and Taw Estuary Crossing (between MHWS on the northern edge to MHWS on the southern edge)) may occur and by the location of any receptors that may be affected by those potential impacts. Direct overlap of activities is limited to the Windfarm Site and a 50km zone of influence for direct and indirect interaction with a wide range of other offshore users.

209. A desk study was undertaken to obtain information on major accidents and disasters. Data were acquired from within the study area through a detailed desktop review of existing studies and datasets.

210. The potential accident scenarios that may occur during the construction, operation and maintenance phase of the Offshore Project have been grouped into the following risk events:

- Extreme temperatures
- Widespread electricity failure and infrastructure failures
- Transport accidents
- Major accidents.

211. In order to avoid impacts, a range of mitigation has been proposed for all phases, this is summarised in **Table 26.8. Chapter 26: Accidents and Disasters**. The assessment has identified that for potential effects scoped in, there will be **no significant** effects on identified receptors during the construction, operation and maintenance, and decommissioning phases of the Offshore Project.

212. Potential effects scoped in were:

- Major fires
- Exposed cables leading to vessel snagging
- Vessel interactions
- Aviation collision
- Accidental spills of hazardous material
- Disturbance of UXO
- Floating WTG breaking free
- Workplace accident.

213. The assessment of cumulative effects from the Offshore Project and other developments and activities concluded that due to the nature of other developments there would be no potential for cumulative effects to occur. There are no potential transboundary effects.

214. For further information on this topic, please see **Chapter 26: Accidents and Disasters.**

3.2.8 Inter-relationships

215. Inter-relationship effects were covered as part of the assessment and considered impacts from the construction, operation and maintenance or decommissioning of the Offshore Project on the same receptor (or group).

216. The specific aim of the inter-relationships assessment was to identify where there's an accumulation of impacts on a single receptor. The assessment also looked at the relationship between impacts.

217. The potential for inter-relationships have been identified in **Chapter 27: Inter-relationships**. Where appropriate, the inter-related impact on a given receptor has been assessed in detail in the relevant ES chapter. None of the inter-relationships identified suggest the need for additional mitigation over and above that which is already identified within the assessment chapter.

218. For further information on this topic, please see **Chapter 27: Inter-relationships.**