1

Rampion 2 WIND FARM

Volume 1:

Preliminary Environmental Information Report: Non-Technical Summary

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Several of the photos presented in this NTS show the existing Rampion 1 project; other photos are provided for illustrative purposes only.

List of useful terms

Term	What does it refer to?
Aspect	The different parts of the environment that could be impacted by the Proposed Development, such as marine mammals, commercial fisheries and the water environment. A Chapter in the PEIR is provided for each relevant aspect.
Baseline environment	The existing environmental conditions, based on the latest available survey and other data. This is used as a benchmark for making comparisons to assess the impact of the Proposed Development.
Development Consent Order (DCO)	This is the means of obtaining consent for developments categorised as Nationally Significant Infrastructure Projects, under the Planning Act 2008.
Environmental Impact Assessment (EIA)	The process of evaluating the likely significant environmental effects of a proposed project or development over and above the existing circumstances.
EIA Regulations, 2017	The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017. The EIA regulations require that the effects of a project, where these are likely to have a significant effect on the environment, are taken into account in the decision-making process for the project.
Environmental Statement (ES)	The written output presenting the full findings of the Environmental Impact Assessment (EIA). This will be included as part of our application for Development Consent.
Embedded environmental measures	Measures to avoid or reduce environmental effects that have been identified during the EIA process and included within the design of Rampion 2.
Habitats Regulation Assessment (HRA)	The assessment of the impacts of implementing a plan or policy on a European Site, the purpose being to consider the impacts of a project against conservation objectives of the site and to ascertain whether it would adversely affect the integrity of the site.
Likely significant effects	It is a requirement of the Environmental Impact Assessment Regulations to determine the likely significant effects of Rampion 2 on the environment. Effects can be positive or negative.
Marine Management Organisation (MMO)	MMO is an executive non-departmental public body, sponsored by the Department for Environment, Food & Rural Affairs. MMO license, regulate and plan marine activities in the seas around England so that they are carried out in a sustainable way.
National Policy Statements (NPSs)	NPSs comprise the Government's objectives for the development of Nationally Significant Infrastructure Projects (NSIPs) and set out national policy against which NSIP applications are assessed. There are currently 12 NPSs of which six relate to energy generation.
Nationally Significant Infrastructure Project (NSIP)	Nationally Significant Infrastructure Projects are major infrastructure developments in England and Wales which are consented by DCO. These include proposals for offshore wind farms with an installed capacity over 100MW.
Non-Technical Summary (NTS)	A Non-Technical Summary presents a summary in non-technical language of the information provided in a technical document (in this case the Preliminary Environmental Information Report).

Term	What does it refer to?
Natural England	The government advisor for the natural environment in England.
Offshore Wind Farm	An offshore wind farm is a group of wind turbines in the same location (offshore) in the sea which are used to produce electricity.
Ornithology	The study and consequent knowledge of birds with all that relates to them.
PEIR Assessment Boundary	The PEIR Assessment Boundary is the area within which Rampion 2 will be located, including the temporary and permanent construction and operational work areas.
Potential effect	A change or impact that could theoretically occur to a receptor as a result of development.
Preliminary Environmental Information Report (PEIR)	The written output of the Environmental Impact Assessment undertaken to date for Rampion 2. It is written to support public consultation and present the preliminary findings of the environmental impact assessment at this point in time and to allow an informed view to be developed of Rampion 2, the assessment undertaken, the preliminary conclusions on the likely significant effects of Rampion 2 and the environmental measures proposed. This NTS is a summary of the PEIR.
Receptor	The receiving environment that may be impacted by the Proposed Development. These include population and human health, biodiversity, land, soil, water, air, climate, material assets, cultural heritage, landscape and seascape.
Renewable energy	Energy that is collected from renewable resources, which are naturally replenished on a human timescale which includes wind.
RED	Rampion Extension Development Ltd
Significance	The predicted level of effect on a receptor, taking into account the sensitivity of the receptor and the nature and severity of the change caused by the Proposed Development.
Statements of Common Ground	Documents which set out where agreement has been reached between the project and other parties on wide ranging issues, such as the approach to the assessment including data collection and methodology used to assess impacts and the appropriateness of mitigation proposed.
The Crown Estate (TCE)	A business that manages the seabed and half the foreshore around England, Wales and Northern Ireland, and play a fundamental role in the sustainable development of this national asset, including the UK's world-leading offshore wind.
The Planning Inspectorate (PINS)	The executive agency which deals with NSIPs on the Secretary of State's behalf.
Water Framework Directive	A substantial piece of EU water legislation that came into force in 2000, with the overarching objective to get all water bodies in Europe to attain Good or High Ecological Status. River Basin Management Plans have been created which set out measures and potential mitigation to ensure that water bodies in England and Wales achieve 'Good Ecological Status'.

1. Introduction

This Non-Technical Summary (NTS) presents a summary of the information and environmental assessment undertaken to date, as set out in the more technically detailed Preliminary Environmental Information Report (PEIR).

1.1 Purpose of this Non-Technical Summary

The aim of this NTS is to provide you with a good understanding of the preliminary environmental issues relating to Rampion 2 Offshore Wind Farm, also referred to as 'Rampion 2' in this NTS.

The focus of the PEIR is to enable the local community and other stakeholders to understand the likely significant environmental effects of Rampion 2.

This NTS includes a description of Rampion 2, a summary of the consultation process and the Environmental Impact Assessment (EIA) work undertaken so far. **Table 1–1** is a summary of each of the sections to help you navigate this NTS so that you can find the information that is of most interest to you.

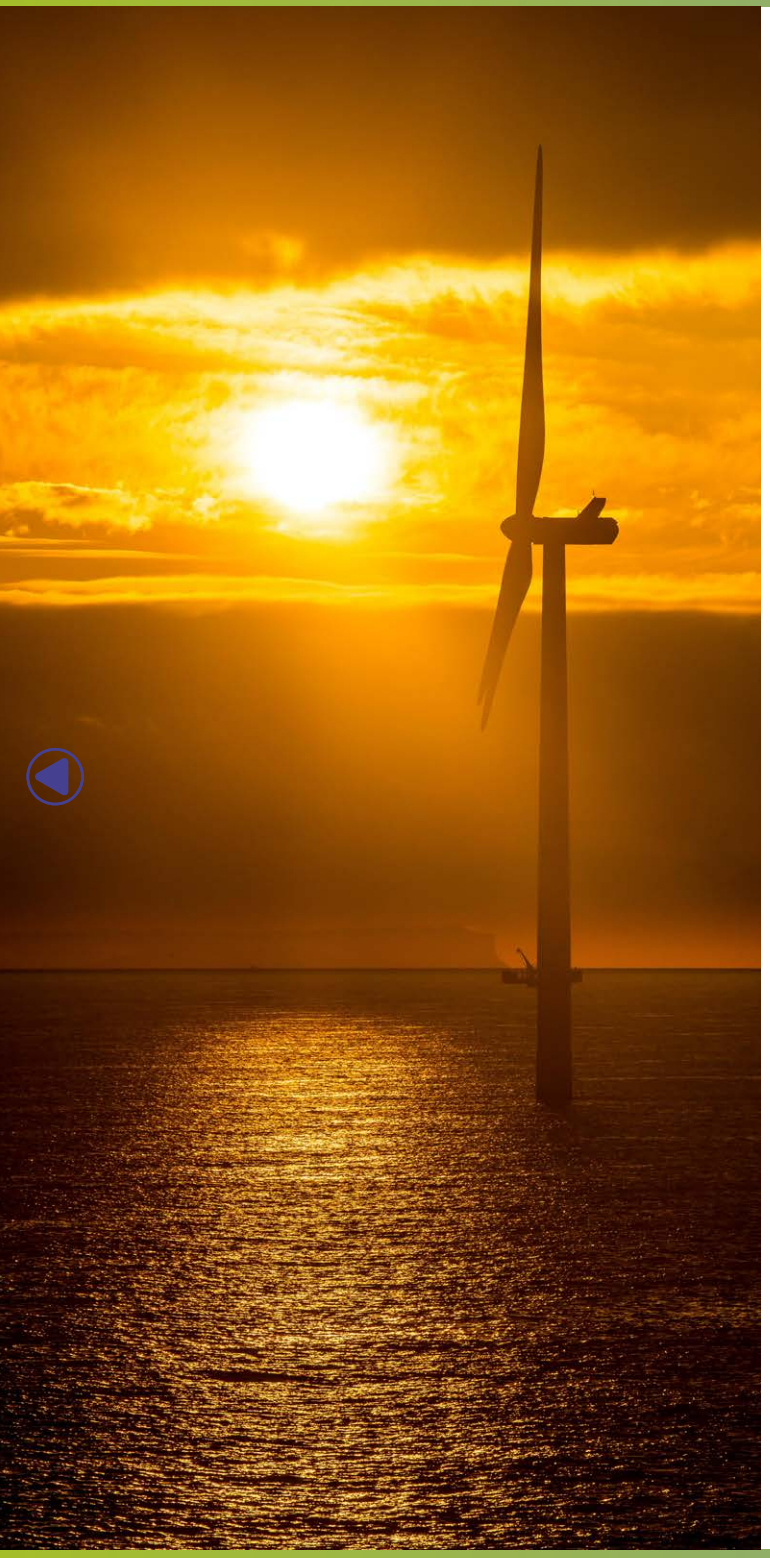


Table 1–1 What's included?

Section	What it is about
1. Introduction	The remainder of this Introduction section introduces what Rampion 2 is, where it is located and why it is needed. An introduction is also given to Rampion Extension Development Ltd (RED).
2. Site selection and alternatives	This section provides a summary history of the design evolution of Rampion 2 and what alternatives have been considered.
3. What is being proposed?	This section explains how Rampion 2 will be built and how long construction will take.
4. Preliminary environmental impact assessment	This section explains how the preliminary assessment has been undertaken and how it has been informed by consultation and stakeholder engagement.
5. Preliminary environmental assessment offshore	This section provides a summary of the approach to environmental assessment and the possible environmental effects experienced offshore as a result of Rampion 2. For each of the offshore environmental topics, the section provides an overview of how the environmental effects have been assessed, a description of the existing environment, overview of environmental measures to avoid or reduce environmental effects, likely significant environmental effects as a result of Rampion 2 and next steps for the assessment.
6. Preliminary environmental assessment onshore	This section provides a summary of the approach to environmental assessment and the possible environmental effects experienced onshore as a result of Rampion 2. For each of the onshore environmental topics, the section provides an overview of how the environmental effects have been assessed, a description of the existing environment, overview of environmental measures to avoid or reduce environmental effects, likely significant environmental effects as a result of Rampion 2 and next steps for the assessment.
7. Have your say	This section explains what happens next in the Environmental Impact Assessment process, and how you can have your say on our proposals.

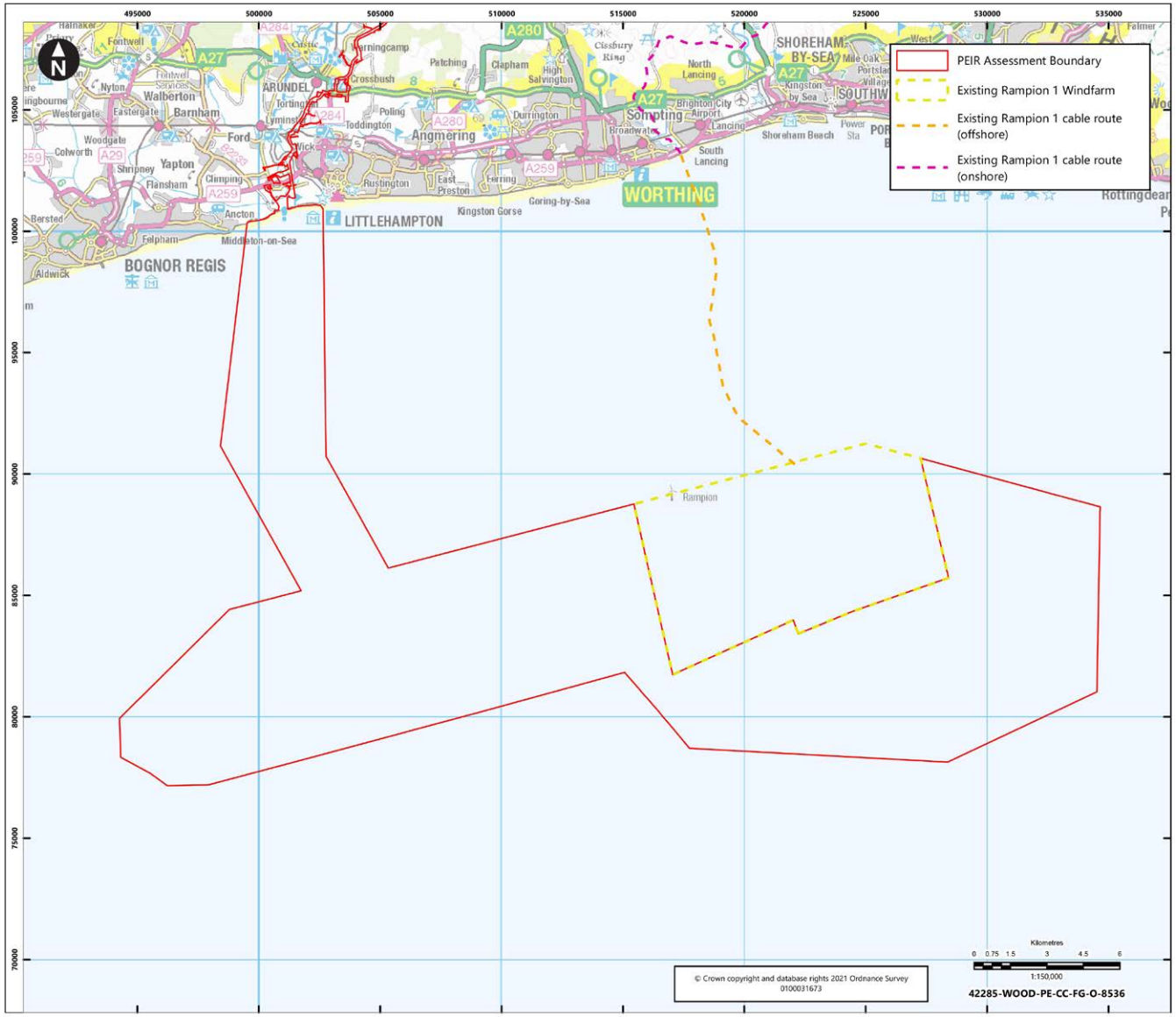
1.2 Rampion 2

Rampion 2 is a proposed expansion of the existing Rampion offshore wind farm (Rampion 1) located in the English Channel off the Sussex coast. Rampion Extension Development Limited (hereafter referred to as 'RED') is developing Rampion 2.

Figure 1–1 shows the location of Rampion 1 and Rampion 2.

Rampion 1 is located between 13km and 25km from the Sussex coast. It has 116 wind turbine generators (WTGs) with a 140m blade tip height and an installed capacity of 400 megawatts (MW). The offshore element of Rampion 2 will be located within an Area of Search adjacent to Rampion 1. Rampion 2 will have a generating capacity of up to 1,200MW. Marine cables will connect the WTGs to up to three offshore substations, and up to four cables from these substations will transfer the electricity.

Figure 1–1 Offshore part of Rampion 2



The onshore parts of Rampion 2 (shown in **Figure 1–2**) comprise cable circuits to be buried underground along a route of approximately 36km from a landfall at Climping in West Sussex to a new substation which will be located within 5km of the existing National Grid Bolney substation in Mid Sussex. The location of the onshore substation is yet to be selected from two candidate sites which have been identified.

1.3 Who is Rampion Extension Development (RED)?

RED is a joint venture between RWE Renewables (RWE), a Macquarie-led consortium and Enbridge. These joint venture partners are also shareholders in the Rampion 1 project, with RWE being the majority shareholder and Development Service Provider for the joint venture.

RWE is an international company with power generation, trading, and supply. Key markets include the UK, Europe, North America, Asia, and Oceania. In 2019, RWE acquired the original development company and major shareholder in Rampion 1, E.ON Climate & Renewables.

Figure 1–2 Onshore part of Rampion 2

1.4 The role of renewable sources of energy

Rampion 2 will support the UK Government's target of delivering over a third of UK electricity from offshore wind by 2030, up from 10% today. National policy and legislation, influenced by the international drivers, highlight the need for renewable energy infrastructure. As a renewable energy project with a generating capacity of up to 1,200MW, Rampion 2 directly responds to these ambitions and will contribute to the UK's renewable energy and climate targets. Further details on relevant policy and legislation are provided in Chapter 2: Policy and legislative context, Volume 2.

The Planning Act 2008 and associated regulations form the basis for applications for National Significant Infrastructure Projects (NSIPs) such as Rampion 2, and the policy content for their consideration and determination is set out in National Policy Statements (NPSs). The UK's commitment to renewable energy has been captured in the publication of the following NPSs which are of direct relevance for the development of Rampion 2:

- EN-1 Overarching Energy;
- EN-3 Renewable Energy Infrastructure; and
- EN-5 Electricity Networks.

The National Planning Policy Framework (NPPF) sets out the Government's economic, environmental and social planning policies for England and how these should be applied.

The NPPF helps inform decision-making on planning applications and includes policies and principles with regard to the protection and conservation of the natural and built environment as well as sustainable growth and development which are relevant to Rampion 2.

The whole of the onshore project footprint lies within the administrative boundaries of West Sussex County Council, Arun District Council, Horsham District Council, Mid-Sussex District Council and the South Downs National Park. Relevant local development plans have been identified so that policy conflicts can be avoided wherever possible.

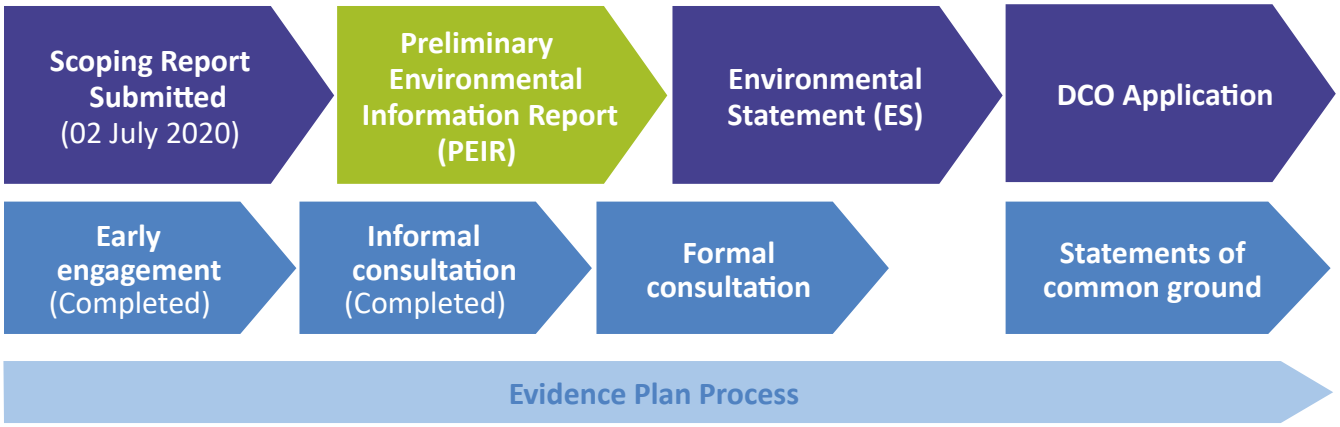
The UK Marine Policy Statement (MPS) provides the policy framework for preparing marine plans and aims to contribute to sustainable development of the UK marine area. The MPS presents offshore wind as an integral component of renewable energy in the UK with some of the best wind resources in the world. Offshore wind will also allow clear progression towards the national greenhouse gas and carbon targets. The South Inshore and South Offshore Marine Plans are of relevance to the offshore infrastructure for Rampion 2.

The PEIR takes full account of wider planning considerations at the national and regional level both on the land and at sea.

In addition, a range of environmental legislation at International, European and National level will apply to the EIA for Rampion 2. The EIA will be undertaken in line with this legislation and policy and specifically in accordance with the requirements of the The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017, hereafter referred to as the 'The EIA Regulations 2017'. In addition, the EIA will take into consideration a range of up-to-date guidance documents.

1.5 Consenting process

Graphic 1–1 Consenting process for Rampion 2



As Rampion 2 will have a capacity greater than 100MW it is defined as a Nationally Significant Infrastructure Project (NSIP under the Planning Act 2008. An application for development consent for Rampion 2 will therefore be required to be submitted to the Planning Inspectorate, who will consider the application and make a recommendation to the Secretary of State for Business, Energy and Industrial Strategy, who will decide on whether development consent should be granted. This consenting process is shown in **Graphic 1–1** and is described in Chapter 5: Approach to the EIA, Volume 2.

The Development Consent Order (DCO) Application will be accompanied by an Environmental Statement (ES) (in accordance with The EIA Regulations 2017).

The requirement to consult on preliminary environmental information is set out in the EIA Regulations 2017. The PEIR has been been prepared to enable consultation bodies, including members of the public and other stakeholders, to develop an informed view of the likely significant effects of Rampion 2 and comment on particular aspects of interest prior to the finalisation and submission of the DCO Application and associated ES.

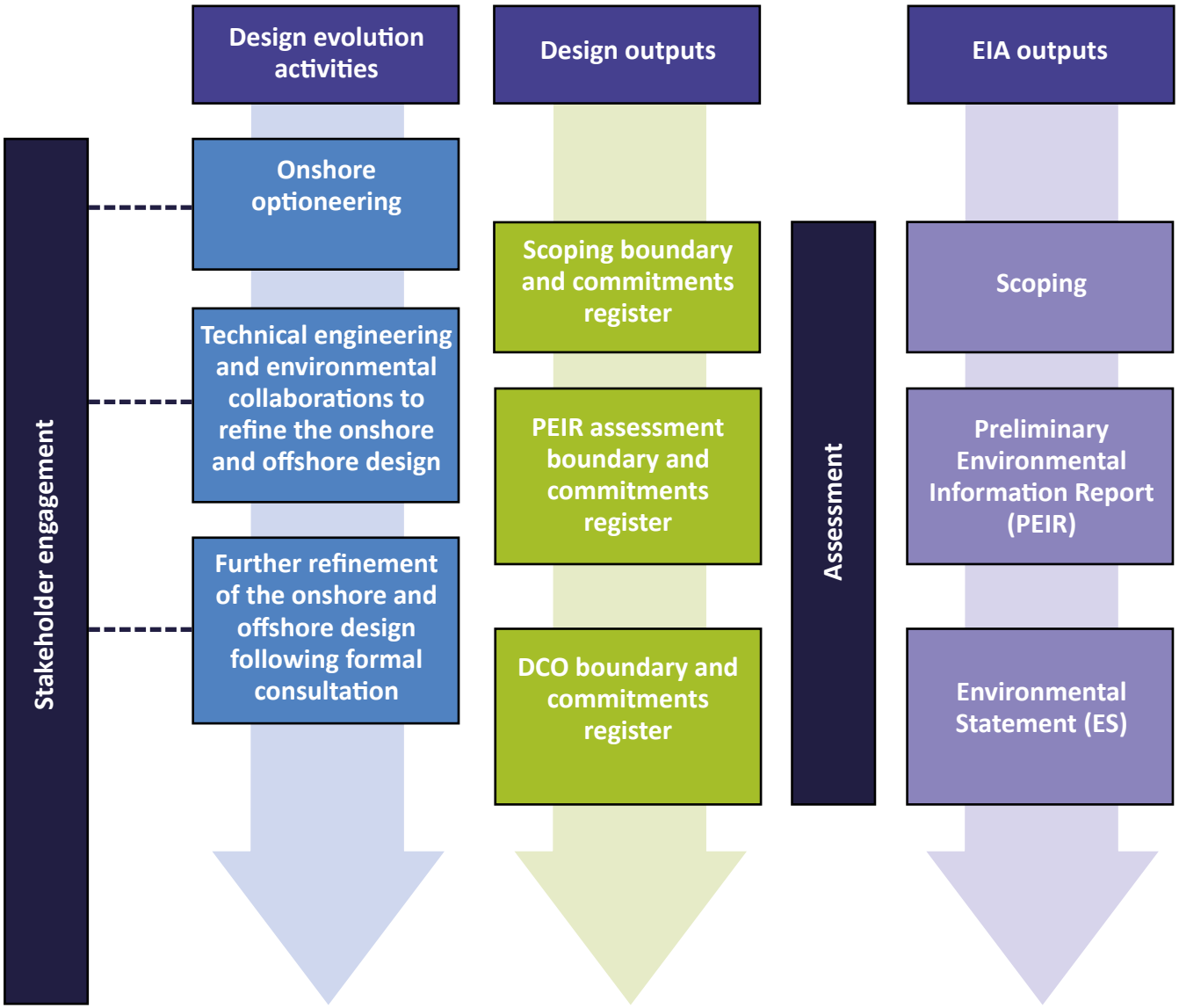
2. Site selection and alternatives

2.1 Introduction

The Rampion 2 site selection and design evolution process is a fundamental part of the EIA. It is an iterative process which has been guided by detailed specialist engineering, environmental assessment and engagement with local stakeholders, regulatory stakeholders and non-governmental organisations. Chapter 3: Alternatives, Volume 2 describes the reasonable alternatives that have been considered during the EIA process.

This design process has led to opportunities for the development of environmental measures which have been adopted to reduce the potential for environmental impacts and effects. These have been included directly into the design of Rampion 2 as commitments, and are referred to as 'embedded environmental measures'. A range of embedded environmental measures have been identified at this PEIR stage and are further discussed in **Section 4.5**. Examples include avoidance of sensitive receptors and best practice environmental measures which were also adopted as part of Rampion 1. **Graphic 2–1** provides a summary of the design evolution process.

Graphic 2–1 Design evolution process



The Scoping Report was based on a Scoping Boundary which at that early stage of the project combined the Areas of Search for the offshore and onshore infrastructure associated with Rampion 2. It defined the area within which Rampion 2 and associated infrastructure would be located.

Further design evolution has occurred since the Scoping stage. Activities have been aimed at ensuring that protecting the environment is central to the design of Rampion 2 from the outset and have included the following activities to reduce and refine the Scoping Boundary both onshore and offshore:

- updating of constraints mapping as new environmental information became available;
- analysis of information collected from EIA surveys;
- identification of technical construction challenges;
- collaborative working with technical environmental specialists and engineers;
- detailed review of land ownership; and
- consultation and engagement with stakeholders.

This process has resulted in the reduction of the Scoping Boundary to the PEIR Assessment Boundary. Design evolution will continue following the publication of the PEIR to refine the design further.

2.2 Offshore design evolution

Offshore wind farm area of search

Overview

RED was awarded the development rights for Rampion 2 in September 2019, and undertook assessments and evaluations to identify the best possible wind farm site. This considered areas close to Rampion 1 ('the extension area'), and the remainder of the area consented as part of Rampion 1 but not developed ('the remaining Zone 6 area'). An initial boundary was identified based on the combination of these areas. Within this boundary, the Scoping Boundary was identified which took account of feasibility concerns and 'hard constraints' which must be avoided. These included:

Feasibility concerns

- navigation risk;
- landscape/seascape, visual and heritage;
- the biological environment and ecology;
- socio-economics (including tourism, recreation, and commercial interests);
- ground conditions and bathymetry including water depth; and
- wind resource and engineering aspects.

'Hard constraints'

- disposal sites;
- oil and gas wells, and other surface and subsurface structures;
- International Maritime Organisation shipping routes;
- consented developments;
- wrecks; and
- active pipelines and cables.

The Scoping Boundary for the offshore wind farm covered the extension area to the west of Rampion 1, the remaining Zone 6 area to the southeast of Rampion 1, plus a small marine cable link area to join these two areas. No wind turbine generators or substations will be located in this link area.

Offshore cable export corridor

A broad offshore export cable corridor has been defined between the offshore wind farm and a landfall at Climping, West Sussex. The process for selecting Climping as the landfall location is described in the grid connection and landfall section. The following design principles were used to initially identify the most appropriate route from the offshore windfarm to shore:

- identifying the shortest route as a preference for cable routing to minimise cost, construction timescales, and transmission losses;
- avoiding key sensitive features and existing activities where possible and where not, seeking to mitigate impacts; and
- minimising potential disruption to populated areas.

The Scoping Boundary for the offshore export cable corridor is located on the northern boundary of Rampion 2, to ensure the shortest route, and to the west of Rampion 1 to avoid crossing the existing export cables. It also avoids Kingmere Rocks Marine Conservation Zone, the Climping Beach Site of Special Scientific Interest (SSSI) designation near the landfall, and an area of active aggregates extraction licence areas.

Offshore refinements since the Scoping Stage

Following Scoping, two workshops were held which brought together technical engineering and environmental specialists. These considered feedback from stakeholders and the Scoping Opinion, in order to reduce the area of the Scoping Boundary to the PEIR Assessment Boundary.

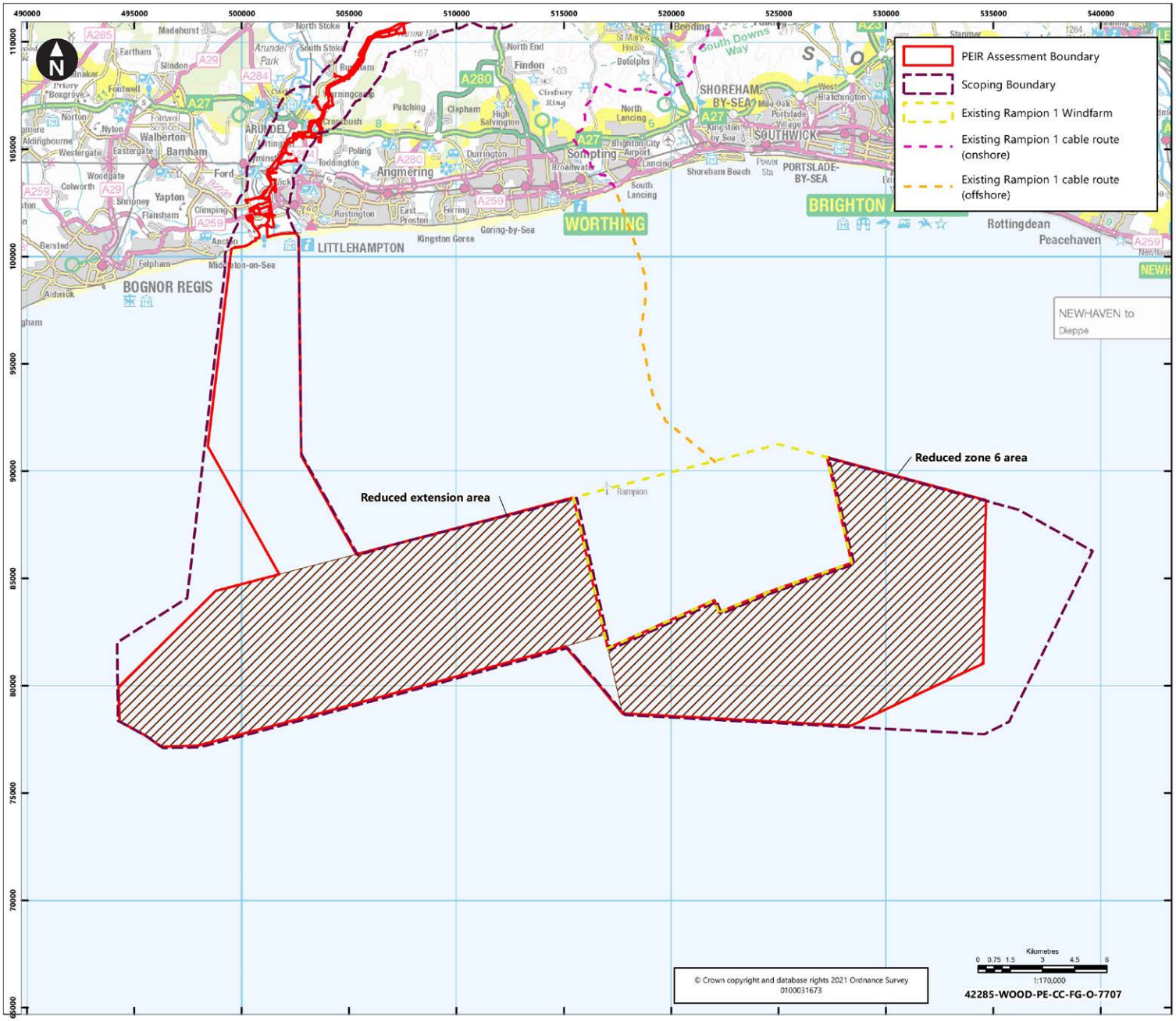
As a result of concerns about shipping and navigation issues, the eastern edge of the Scoping Boundary was refined to increase the distance to the Dover Strait Traffic Separation Scheme, and the western edge was refined to provide more space between the array area and the Marine Conservation Zone containing Owers and Mixon rocks.

Concerns regarding visual impact have also been considered by reducing the Zone 6 area in the east, to reduce the impact from the Sussex Heritage Coast. In addition, this eastern area was reduced in order to ensure it was fully covered by existing digital aerial ornithological surveys.

Following Scoping, further refinements were also made to reduce the area of the offshore export cable corridor to take account of engineering requirements.

These refinements since Scoping are shown in **Figure 2–1**.

Figure 2–1 Offshore design evolution



Wind farm array area of search: reduced from 315km² at Scoping phase, **to 270km²** at PEIR.

2.3 Onshore design evolution

Introduction

A site selection exercise was undertaken to select a landfall location, an onshore cable corridor, and onshore grid connection location. All the available options for onshore sites were identified and appraised environmentally, technically and commercially. These were then subsequently refined to create the onshore part of the PEIR Assessment Boundary. Options were revisited as more information became available.

Grid connection and landfall

Large scale offshore wind farms such as Rampion 2 need to be connected into National Grid's 400kV electricity transmission system, as opposed to the local Distribution system which is generally designed to accommodate smaller generators and feed local homes and businesses. Rampion 1 feeds its 400MW output into Bolney National Grid Substation in Mid Sussex. It is not possible to use or readily modify the Rampion 1 onshore infrastructure since these cables and substation equipment already operate at full capacity and were only designed for the original wind farm approved in 2014.

Six potential grid connection locations were initially identified, but three (Ninfield, Chilling, and Fawley) were discounted early in the appraisal process as they would render the overall wind farm not economically viable.

In addition to considering the landfall used for Rampion 1 at Brooklands Park in East Worthing, seven additional landfall options were identified. A suitable landfall requires sufficient physical space onshore for the onshore cabling, construction operations including a Horizontal Directional Drilling (HDD) rig, and a large inshore area for export cable laying vessels. It is also crucial that there is a workable onwards route towards the eventual grid connection point. Two options were immediately discounted (Saltdean and Rottingdean) as steep cliffs at these locations mean there is uncertainty over the feasibility of construction. Six landfall options were therefore assessed.

This process led to a shortlist of seven potential landfall to grid connection options:

- Brooklands to Bolney;
- Climping to Bolney;
- Climping to Lovedean;
- Church Norton to Lovedean;
- Bracklesham to Lovedean;
- East Wittering to Lovedean; and
- Tide Mills to Little Horsted.

A constraints mapping approach was used to assess the environmental, consenting and technical constraints associated with each of these options. Constraints data was gathered and presented on maps, and constraints were described as 'hard' or 'soft' constraints. 'Hard' constraints are generally areas that must be avoided, such as internationally protected sites for biodiversity or historic environment, settlements, and steep gradients. 'Soft' constraints are those which need to be considered by the site selection process but on their own will not generally mean an option is discounted, such as landscape and visual designations, public rights of way, nationally designated sites for biodiversity, and technical constraints such as motorways and railway lines. The mapping was ground-truthed through site visits, and the seven options were compared, based on the available information including length of route, environmental issues, technical issues and risk factors. This led to the selection of the Climping to Bolney option as the most likely to minimise environmental impacts while remaining technically feasible.

Onshore cable corridor

The Scoping Boundary of the onshore cable corridor from Climping to Bolney included options for sections of the route where there was insufficient information to choose the best route (at Climping, Warningcamp, Wepham, Norfolk Clump, Washington, Windmill Quarry, Henfield, Bolney Road / Kent Street, and around the substation areas of search). Following scoping, the number of options was reduced through a process that included stakeholder engagement, multidisciplinary workshops and additional environmental surveys. Design refinement workshops were carried out to compare the potential alternatives at each location using a BRAG (Black, Red, Amber, Green) appraisal approach. This classified the constraints for each option using a colour coding and rating system, including the following constraints:

- biodiversity;
- historic environment;
- agricultural land;
- landscape and visual;
- planning policy and planning applications;
- residential properties and other sensitive land uses;
- flood risk and surface water; and
- technical concerns.

The BRAG ratings were used to compare the potential alternatives, and as a result of this process the Scoping Boundary was reduced in size and most options were removed, to create the onshore part of the PEIR Assessment Boundary.

Options remain at Warningcamp and close to the substation areas of search, and will be refined further prior to DCO submission.

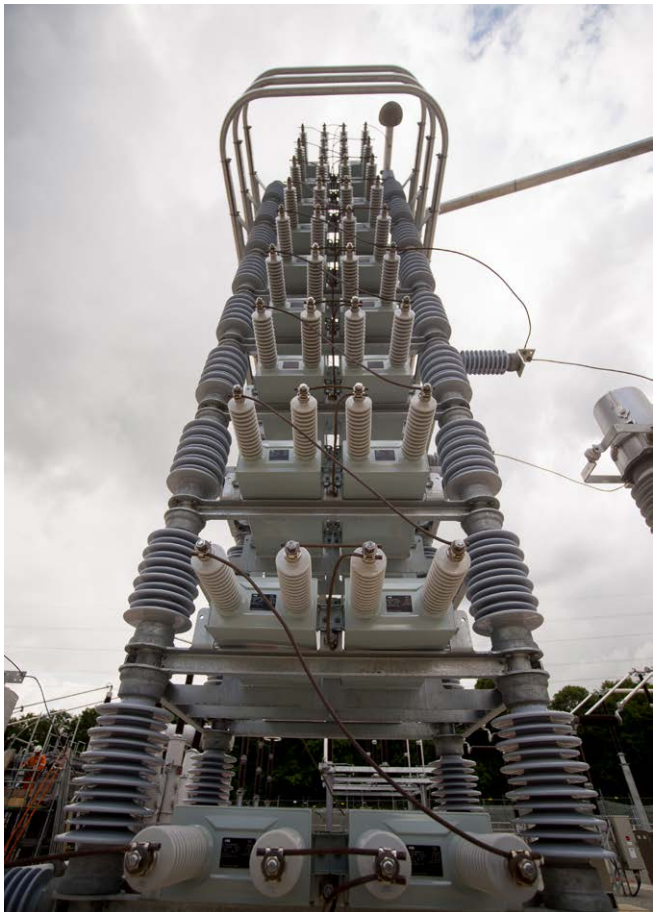
Onshore substation

A new substation is needed to increase the cable route voltage from 275kV to 400kV before it can connect to the grid at the existing National Grid Bolney substation. Seven substation search areas were identified during Scoping, which were located within 5km of Bolney substation and avoided constraints such as residential properties and designated sites.

Following Scoping, further design work showed that an area of search of approximately 9 hectares (ha) is required to site the substation including areas for environmental measures such as landscaping, and temporary construction. Therefore, three of the initial substation search areas were discounted (Snake Harbour, Frylands, and Eight Acres Shaw).

Onshore substation search area refinement workshops were carried out to consider technical, environmental, stakeholder and land ownership issues at each of the four remaining sites, and to reduce the number of options. The same BRAG appraisal approach and constraints were used as for the refinement of the onshore cable corridor. As a result of this appraisal process, the sites at Star Lane and Wineham Lane South were discounted, as they were found to have the most environmental constraints and stakeholder concerns.

Both Bolney Road / Kent Street and Wineham Lane North substation search areas have been retained within the PEIR Assessment Boundary. Options for the cable route to connect to the substation have been included in the PEIR, as the final cable route selection depends in part on the substation location. Further information on constraints at each of the two substation options will be gathered in advance of the DCO Application to inform the selection of the final substation location.



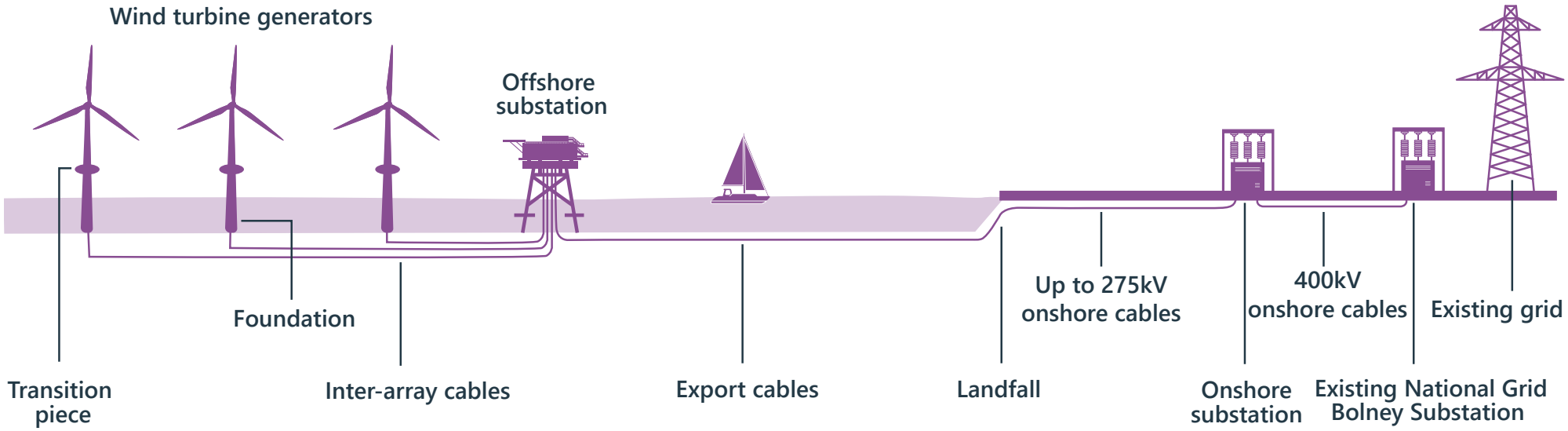
3. What is being proposed?

3.1 Key components of Rampion 2

Rampion 2 comprises both onshore and offshore infrastructure associated with the proposed offshore wind farm, as described in Chapter 4: The Proposed Development, Volume 2. The components of Rampion 2 are summarised in **Graphic 3–1** and include:

- Offshore wind turbine generators (WTGs) and associated foundations with an installed capacity of up to 1,200MW, but not exceeding the number of WTGs installed at Rampion 1
- Inter-array cables connecting the WTGs to up to three offshore substations
- Up to four offshore export cables will be buried under the seabed within the final cable corridor
- A single landfall site connecting offshore and onshore cables using HDD installation techniques;
- Buried onshore cables in a single corridor approximately 36km in length using HDD, and trenching and backfilling installation techniques; and
- A new onshore substation that will connect to the existing National Grid substation at Bolney, Mid Sussex

Graphic 3–1 The key components of Rampion 2



3.2 Offshore development

Wind Turbine Generators (WTG)

The WTGs will comprise three WTG blades linked to an axis and attached to a nacelle which houses a gearbox, generator, and transformer. This will be placed at the top of a tower which may be assembled in sections on top of a foundation. The nacelle will be able to rotate to face the oncoming wind direction. The transformer in the nacelle steps up generated electricity to a higher voltage to reduce losses during transmission over the longer distances to the substation. Rampion 2 will have a generating capacity of up to 1,200MW. The WTGs will have a height to blade tip of up to 325m from the Lowest Astronomical Tide (LAT), with a clearance between the lowest blade and the Highest Astronomical Tide (HAT) of no less than 22m. The WTG towers, nacelles and blades will be transported from a port to the Rampion 2 array area on the installation vessels or on separate transport vessels and assembled in location.

The offshore components of Rampion 2 refer to works seaward of Mean High Water Springs (MHWS).

WTG foundations

The type of WTG foundation to be installed will be determined from the results of geotechnical investigations, existing environmental sensitivities and final WTG selection. It is anticipated that more than one type of foundation may be used for Rampion 2.
The following foundation design options are currently being considered for Rampion 2:

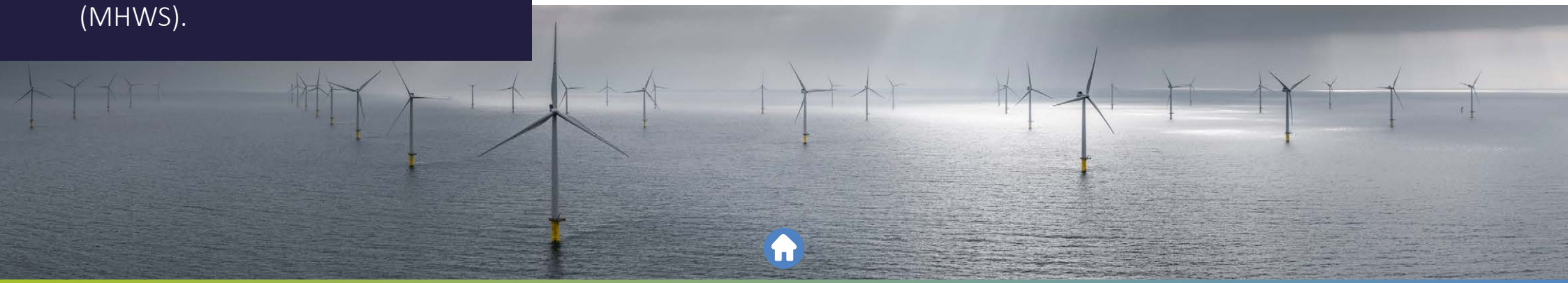
- monopiles;
- jacket foundations with pin piles; and
- jacket foundations with suction buckets.

The foundations will be fabricated offsite, stored at a suitable port facility and transported to site as needed. Specialist installation vessels will be needed to transport and install foundations.

Each foundation type may require some form of seabed preparation which may include seabed levelling and removing surface and subsurface debris. Scour protection material may be required around the base of some or all WTG foundations to protect from current and wave action ensuring structural integrity.

Offshore substations

Offshore substations collect the electricity generated by the WTGs, via electrical cables, so that it can be transmitted to National Grid. It is anticipated that there will be up to three offshore substations. The substations will transform generated electricity from the WTGs to a higher voltage for transmission to shore via export cables. Each substation will comprise a multiple-tier platform installed on a foundation. The foundation design options being considered for the offshore substations are monopiles and jackets with pin piles. The substation platform will likely include components such as transformers, batteries, generators, switchgear, fire systems, and modular facilities for operational and maintenance activities. As with the WTG foundations, scour protection material may be required. The location and extent of the offshore substations will be confirmed through the detailed design process, but they will be located within the PEIR Assessment Boundary.



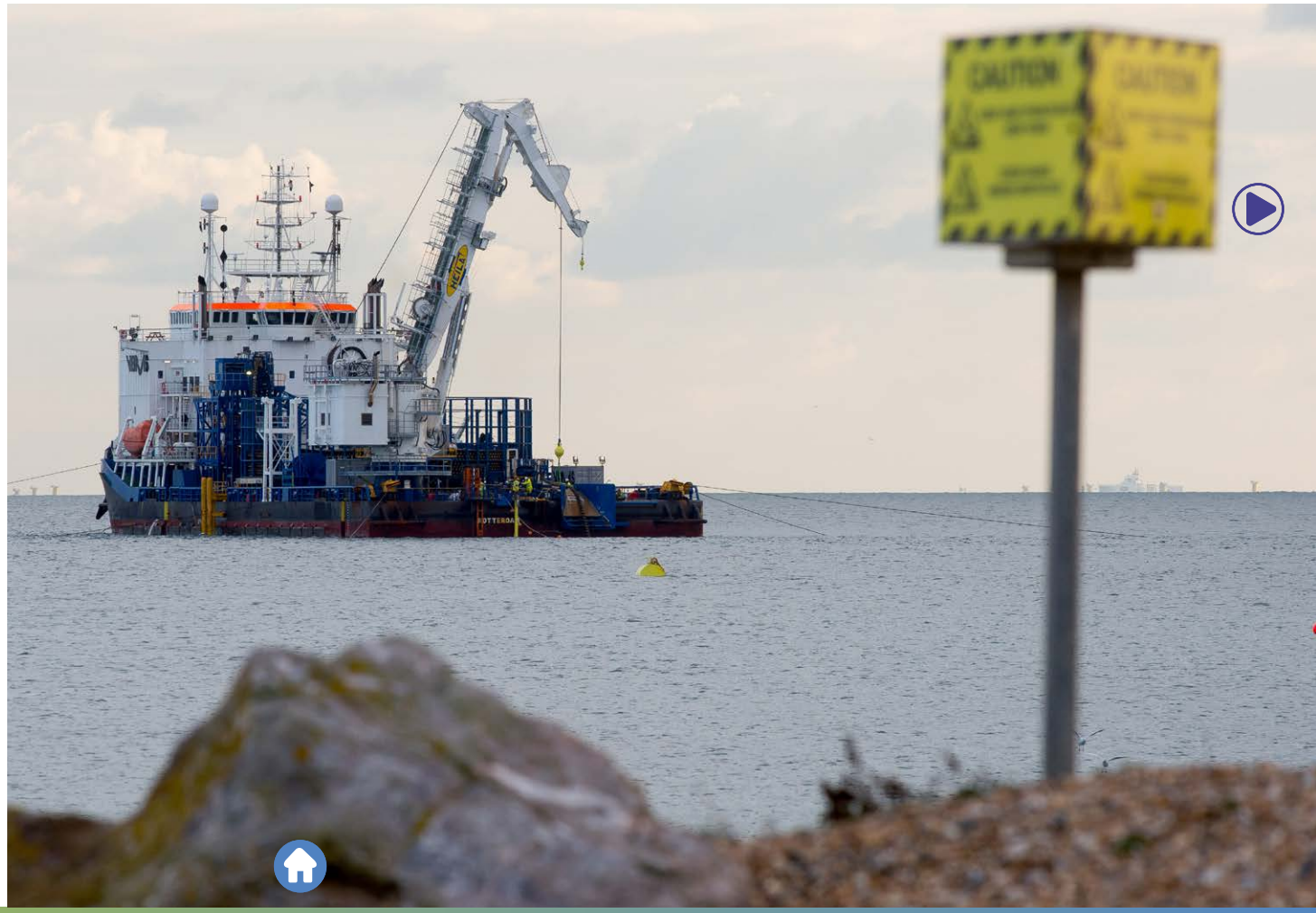
Inter-array cables

Subsea array cables will connect the WTGs to each other in strings. These array cable strings will connect the WTGs to the offshore substations. The array cables will typically be buried below the seabed surface depending on the outcome of the cable burial risk assessment. The final depth of the cables will be dependent on the seabed geological conditions and the risks to the cable (for example from anchor drag damage). The installation of the cables is expected to require either ploughing, trenching, jetting, or a combination of these techniques. Cable installation may require some form of seabed preparation and following installation the addition of any required cable protection.

Export cables

Rampion 2 may use two offshore interconnector export cables to link together the offshore substations in the array area. This provides the transfer of generated power from the east side of the site to the west side where the landfall is located. Electricity from the offshore substations will be transmitted via up to four export cables to the transition joint bays (TJBs) located at the landfall near Climping Beach. It is anticipated the cables will be laid in separate trenches at different times and installed via either ploughing, jetting, trenching, or post-lay burial techniques. The choice of technique will be dependent on ground conditions along the specific cable routes. As with the inter-array cables, the cable installation may require some form of seabed preparation and following installation the addition of any required cable protection.

The offshore export cables will come ashore between Middleton on Sea and Littlehampton at Climping. To reduce the impact of the landfall, a trenchless solution (HDD) is to be used to install ducts that will house the cables under Climping beach. The offshore export cables will be pulled ashore through these pre-installed HDD ducts and will interface with the onshore cables at a TJB, where they will be joined. A temporary construction compound will be required during construction and this will be located behind Climping beach.



3.3 Onshore development

Onshore cable corridor

The onshore cable corridor is routed from the landfall at Climping through to a proposed new substation, and then onto the existing National Grid Bolney substation. The onshore cable corridor is approximately 36km in length and approximately 50m in width (25m either side of a centreline) within which the following will be located:

- permanent infrastructure including transmission cables and associated joint bays; and
- temporary infrastructure including trenches, HDD areas, excavated material, construction compounds, haul roads and the likely access requirements.

The onshore components of Rampion 2 refer to works landward of Mean High Water Springs (MHWS).

During installation of the onshore cables, the topsoil and subsoil will be stripped and stored on site within the temporary working corridor and stored in separate stockpiles. The trenches will then be excavated using a mechanical excavator, and the cables will be installed into the open trench. The cables are then buried by backfilling the trench with the excavated material before the land is reinstated to its previous use. Where there are road, rail, water, footpaths, third party services, and other crossings along the cable route, each crossing will be individually reviewed/ surveyed during detailed design to confirm the crossing methodology employed. Open cut crossing methodology will predominantly be used. Where appropriate, HDD techniques will be used to cross, for example, main watercourses, railways and roads that form part of the Strategic Highways Network. Along the cable route joint bays (sub-surface structures) will be constructed to enable cable installation and cable jointing, with these locations to be determined during the detailed design phase.

During construction temporary compounds will be required along the cable corridor for laydown and storage of materials, plant and staff facilities. Four sites have been identified as potential construction or logistic compounds, typically being 50m x 75m in area. The location and number of these compounds will be selected at a later stage in agreement with the principal construction contractor. Following completion of constructions works, the compound facilities will be removed, and each compound site will be returned to its original state.

Temporary access points are required along the onshore cable corridor to allow the transportation of materials, equipment and personnel to and from the construction sites. These access points will allow access to the construction corridor where there will be a temporary haul road running along the length of the cable route, except for locations where there are trenchless or road crossings.

All proposed temporary compounds and accesses are located within the PEIR Assessment Boundary.

A new substation

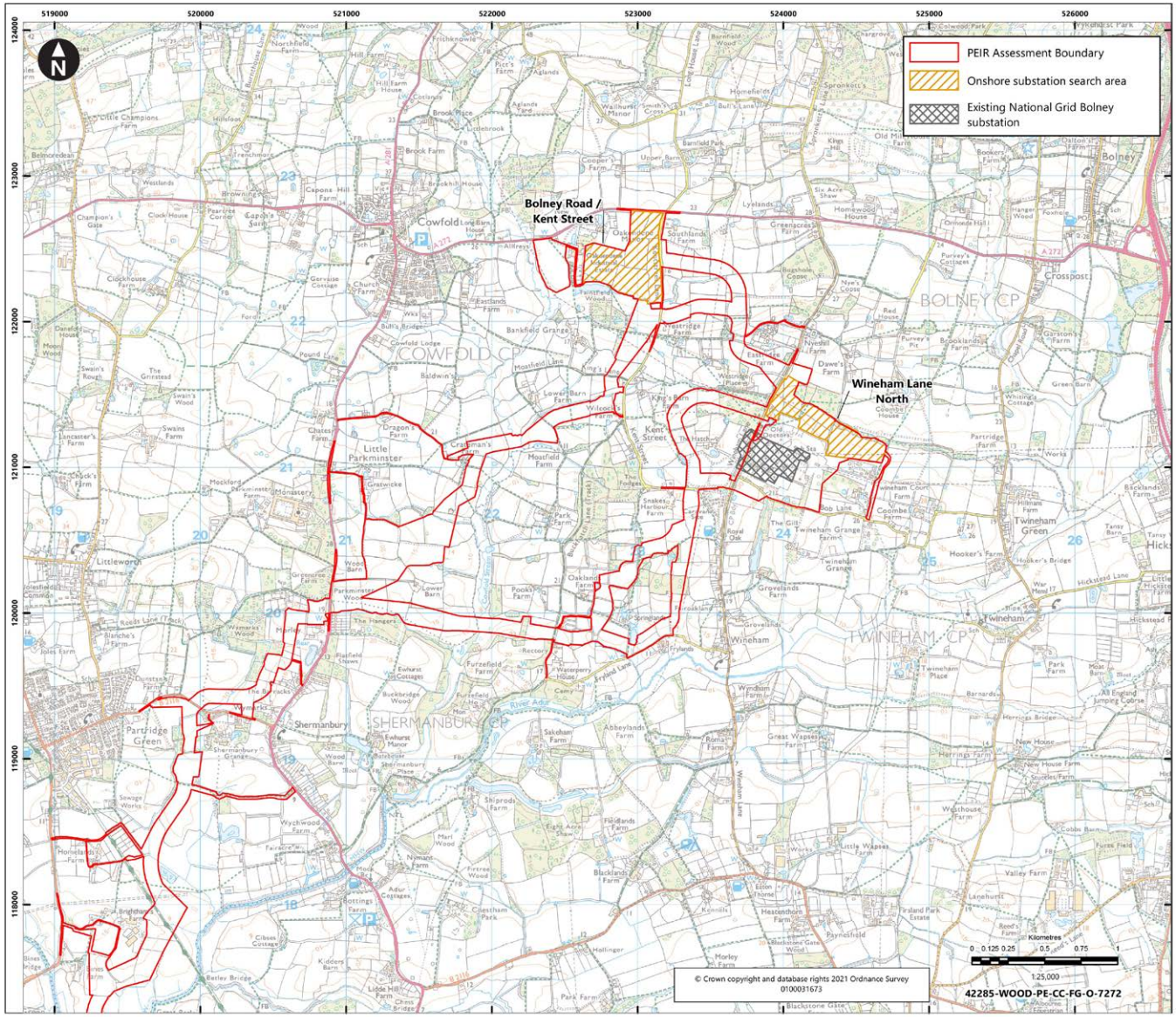
Following assessment of a number of options, two substation search areas are under consideration. These two areas lie within the PEIR Assessment Boundary. These search areas are known as:

- Bolney Road/Kent Street; and
- Wineham Lane North

The purpose of the new substation is to increase the cable route voltage from 275kV to the 400kV required to connect to the existing National Grid Bolney substation. The onshore substation will comprise electrical components and equipment necessary to connect the electricity generated by Rampion 2 to the existing network, including, for example: transformers, switch room, control building and welfare facilities. Some equipment will be placed outdoors and other equipment will be housed in buildings or enclosures. The overall built site footprint for the proposed onshore substation is anticipated to be up to 5.9 ha.

Figure 3–1 illustrates the locations of the two substation search areas and their corresponding cable corridor options.

Figure 3–1 Substation search area locations



3.4 What is the timeline for construction and operation of Rampion 2?

An indicative construction programme for Rampion 2 is presented in **Graphic 3–2** illustrating the anticipated duration of the major construction / installation elements. In total construction is expected to take approximately four years.

Once construction is complete and the wind farm is fully commissioned Rampion 2 will enter its operation and maintenance phase. Upkeep of the infrastructure at sea may include regular inspections, routine servicing, component replacements, repairs, remedial works, and painting and cleaning.

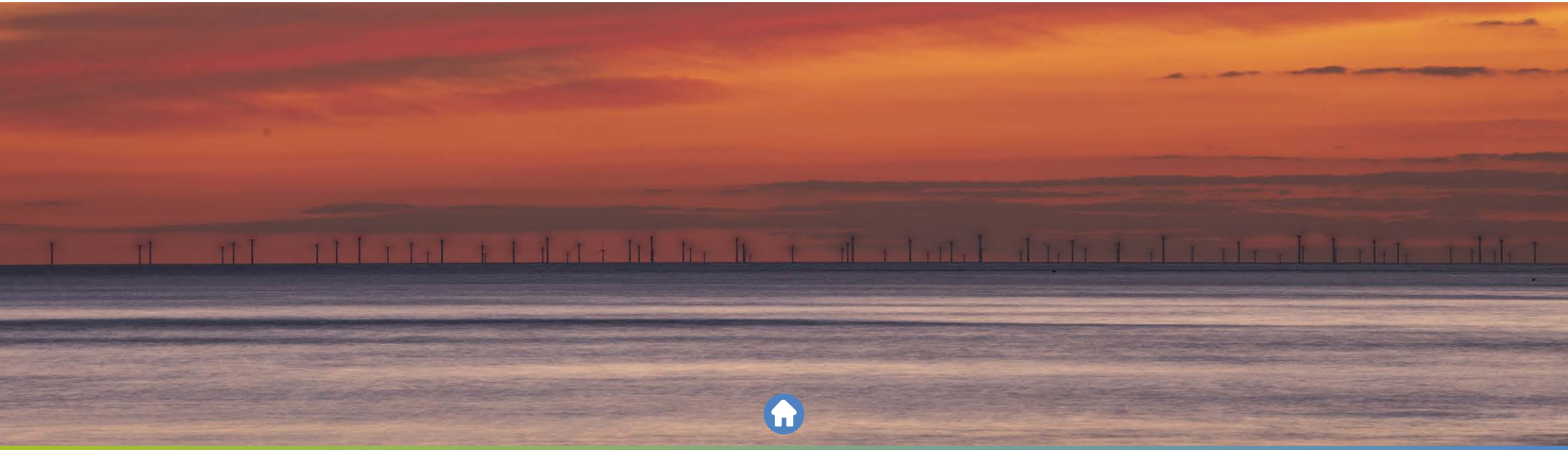
The operational lifetime of Rampion 2 is expected to be around 30 years. After commissioning, operation and maintenance activities can be divided into three main categories:

- scheduled maintenance;
- unscheduled maintenance; and
- special maintenance in the event of major equipment breakdown and repairs.

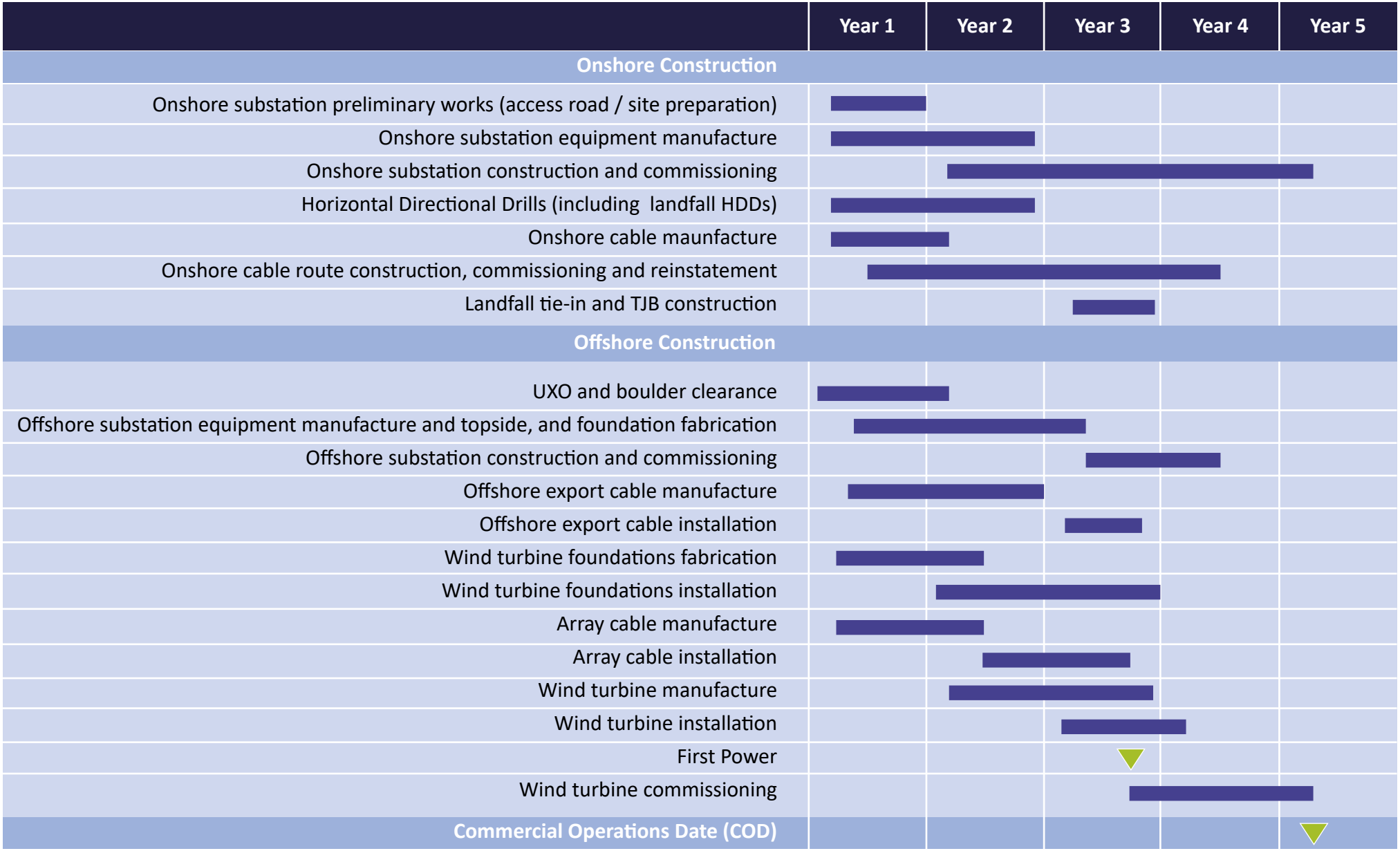
At the end of the operational life of Rampion 2, it is anticipated that all offshore structures above the seabed will be completely removed. The decommissioning sequence will generally be the reverse of the construction sequence and involve similar types and numbers of vessels and equipment.

It is anticipated that onshore electrical cables will be left in-situ. The onshore substation may be used as a substation site after decommissioning of the Proposed Development or it may be upgraded for use by another project. This would be subject to a separate planning application. If the onshore substation is decommissioned fully, the decommissioning works are likely to be undertaken in reverse to the sequence of construction works and involve similar levels of equipment.

The decommissioning duration of the offshore and onshore infrastructure may take the same amount of time as construction of Rampion 2, up to four years, although this indicative timing may reduce.



Graphic 3–2 Indicative construction programme



4. Preliminary environmental impact assessment

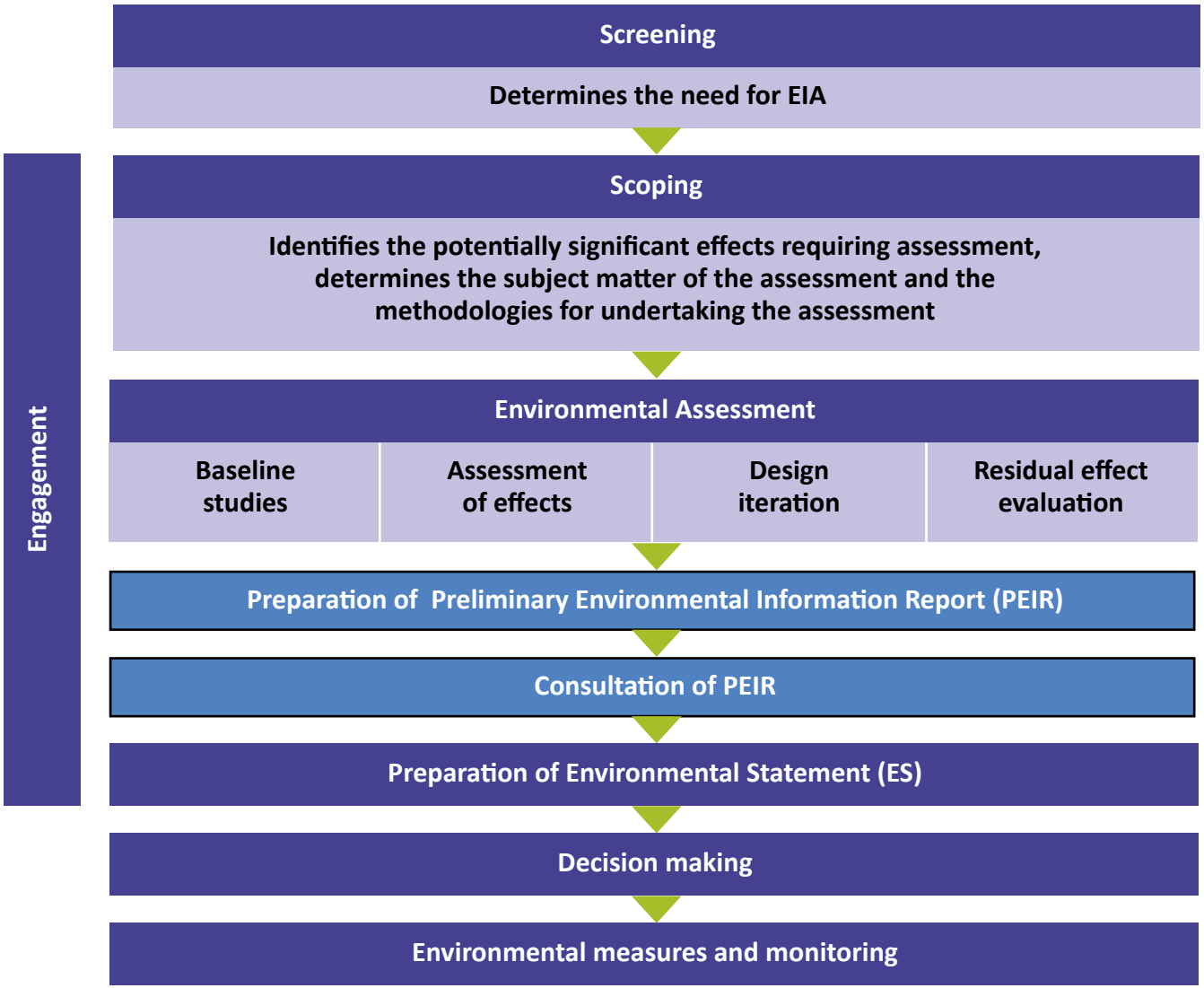
The PEIR presents a preliminary assessment of the likely significant environmental effects of Rampion 2 and forms part of the consultation exercise.

4.1 What is the Preliminary Environmental Information Report?

The PEIR has been prepared at a point in time during the EIA process when the design of Rampion 2 is still being refined, the likely significant environmental effects are still being assessed and the potential for environmental measures is being fed back into the design.

The purpose of the preliminary assessment presented in the PEIR is to enable members of the public, consultation bodies, and other stakeholders, to develop an informed view of the likely significant effects of Rampion 2, and comment on aspects of interest. RED is working with stakeholders to develop additional ways in which the negative effects of Rampion 2, identified by this assessment, can be avoided or reduced. Feedback received through the consultation process, will be used by RED to inform the ongoing development of Rampion 2 design, and additional measures to address any identified significant environmental effects.

Graphic 4–1 The EIA process



The full findings of the EIA process will be presented in an ES that will be submitted as part of the application for development consent. The ES provides the public and relevant organisations (such as the Environment Agency, Natural England and Marine Management Organisation) with the environmental information needed to understand and comment on a development, and provides decision-makers with the environmental information to allow a decision to be made whether to grant consent for the development.

The EIA process and the position of the PEIR within this is summarised in **Graphic 4–1**. Further details about the EIA process are described in Chapter 5: Approach to the EIA, Volume 2.

4.2 Scoping and engagement

Engagement has been undertaken with consultees, stakeholders and other interested organisations.

Early engagement

Central to the delivery of the EIA has been and will continue to be the focus on engagement with consultation bodies, community stakeholders, and other interested organisations and individuals.

A Scoping Report was submitted to the Planning Inspectorate in July 2020. The Scoping Report identifies the potentially significant effects requiring assessment, determines the subject matter of the assessment and the methodologies for undertaking the assessment. The Planning Inspectorate subsequently provided a Scoping Opinion, which included comments from a range of stakeholders, on behalf of the Secretary of State (SoS), in August 2020. The Scoping Opinion and the statutory consultee responses have subsequently informed the assessment work and further design evolution undertaken to date.

Informal consultation and engagement

A programme of ongoing informal consultation and engagement is also underway with key stakeholders including, but not limited to, the Environment Agency, Natural England, Historic England, Highways England, CEFAS, Marine Management Organisation, and local authorities to inform Rampion 2 design at an early stage.

This PEIR has also been informed by an informal consultation run by RED between 14 January 2021 and 11 February 2021. An accompanying virtual exhibition introduced Rampion 2, the development process, and shared information on the emerging design process inviting feedback from stakeholders. All feedback is detailed within the **Interim Consultation Analysis** which is provided alongside the PEIR.

RED has set up a series of Project Liaison Groups (PLGs) which bring together various local interest groups to allow for the sharing of information, discussion and feedback with the Rampion 2 project team as proposals for an extension of the wind farm are scoped and developed. There are six PLGs in total covering Business & Tourism, Environment, Sea Users, Onshore Community, Coastal Community and Public Rights of Way.

In addition, RED has met with the Planning Inspectorate to provide updates on scoping, the design evolution activities and the approach to the EIA.

Statement of Community Consultation

In accordance with the Planning Act 2008, a Statement of Community Consultation (SoCC) has been prepared. The SoCC sets out how RED will consult with the local community with respect to Rampion 2, the consultation methods to be used, the scope of the consultation and the consultation period.

The Evidence Plan Process (EPP)

An Evidence Plan Process (EPP has been initiated and commenced in September 2020 to seek agreement on the evidence required to be submitted to the Planning Inspectorate (PINS as part of the DCO Application. The EPP aims to provide a forum for discussion and a framework for recording areas of agreement / disagreement between RED and the relevant statutory authorities, advisers, and other relevant stakeholders with regard to those matters to be addressed by the EIA and Habitats Regulations Assessment (HRA process. The HRA process is undertaken by the competent authority to determine the potential for impacts from a project to European sites. In order to carry out the HRA, the competent authority requires a report to be submitted alongside the Environmental Statement (ES. Information collated to date which will inform the HRA is presented in the PEIR in **Chapter 14: Nature conservation, Volume 2** and **Chapter 23: Terrestrial ecology and nature conservation, Volume 2** and a preliminary draft of the HRA screening report is provided in **Appendix 23.2: HRA Screening Report, Volume 4.**

4.3 Assessment methodology

Environmental Impact Assessment (EIA is a process for identifying the likely significant environmental effects (positive and negative of a proposed development to inform the decision-making process for development consent to be granted. A full description is provided in Chapter 5: Approach to the EIA, Volume 2.

The EIA considers all relevant **'aspects'** that may be impacted both onshore and offshore, such as landscape, marine mammals, commercial fisheries and historic environment etc. The aspects to be included in the EIA were agreed with the Planning Inspectorate and other stakeholders through the Scoping process, with the Planning Inspectorate providing a Scoping Opinion.

The PEIR presents the preliminary EIA findings. A separate PEIR Chapter presents the detailed findings for each aspect that has been assessed (Chapter 6 to Chapter 28, Volume 2).

A detailed description of the existing **'baseline environment'** has been produced for the offshore and onshore development areas, through a combination of desk-based studies, consultation and site specific surveys.

All **'potential effects'** arising from the construction, operation and decommissioning Rampion 2 are identified as part of the EIA methodology, for example loss of habitat or change in noise levels. The assessment considers the level of significance of each effect on each **'receptor'** (the receiving environment such as water, air, land, and specific species). The assessment is undertaken by EIA specialists such as ecologists and marine scientists. The general approach to determining **'significance'** of an effect is to consider the sensitivity of a receptor alongside the nature and severity of the change. A detailed explanation of how different effects are deemed significant for each aspect is provided in each Chapter of the PEIR.

All potential effects are considered as part of the EIA process. However, **'likely significant effects'** are the key issues that are identified when considering the level and type of effect and the sensitivity of the environmental receptor.

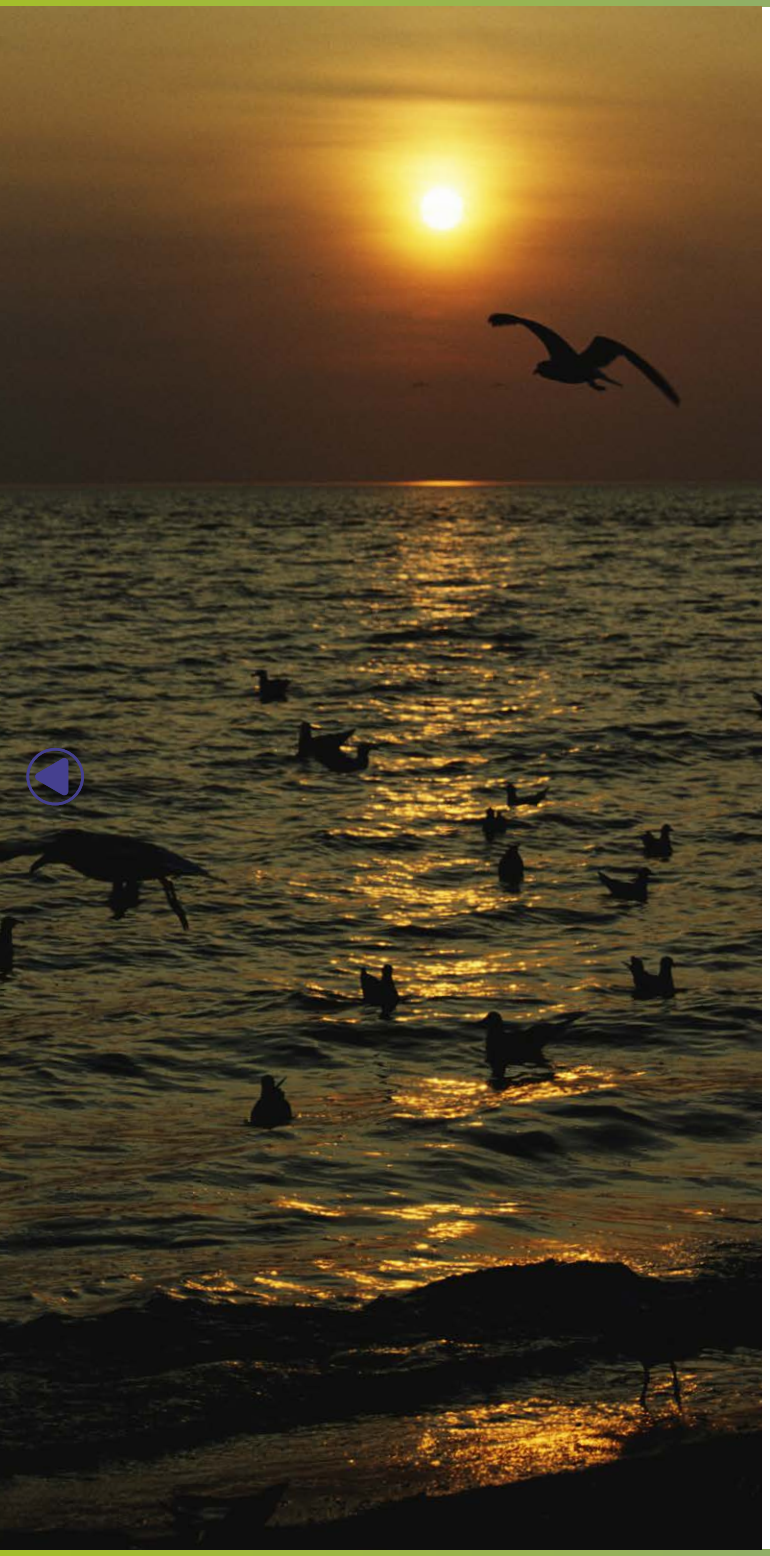
The PEIR also includes a consideration of potential cumulative, transboundary and inter-related effects:

- cumulative effects are the combined effect of Rampion 2 in combination with the effects from a number of different projects, on the same single environmental receptor/resource are considered;
- transboundary effects are where there is the potential for Rampion 2 to affect the environment of another EEA state; and
- inter-related effects are those that arise from multiple impacts and activities from the construction, operation and decommissioning of Rampion 2 on the same receptor, or group of receptors.

4.4 Maximum design scenario

In order to establish the scope of environmental assessment, the PEIR assessed Rampion 2 based on what is termed a 'Rochdale Envelope' or parameter-based design envelope approach. Assessing the environmental effects of Rampion 2 using a parameter-based design envelope approach is well-established for large scale infrastructure projects and means that the assessment will consider a maximum design scenario whilst allowing the flexibility to make improvements in the future in ways that cannot be predicted at the time of submission of the DCO Application. Such design decisions may include the precise model and dimensions of WTG model which will be available at the time of placing orders for the project, or the final optimised layout taking into account detailed engineering factors and wind energy optimisation. Development permitted by the DCO will not extend beyond the clearly defined parameters assessed in the ES.

The findings presented in the PEIR are based on a preliminary assessment and reflect the current stage in the design process and understanding of baseline conditions, allowing for conclusions as to the likely significant environmental effects to be drawn. Where the design is still evolving or further information on baseline conditions is still to be obtained, a precautionary approach is applied to ensure a reasonable worst-case or maximum design scenario is assessed in the PEIR. In using this precautionary approach to the assessment, the level of effect may be overstated and subsequently reduced at the time of Application.



4.5 Embedded environmental measures

EIA is an iterative process and opportunities for environmental mitigation, referred to as '**embedded environmental measures**' have been considered throughout the design development of Rampion 2 and in the assessment undertaken for the PEIR where likely significant effects have been identified. Where possible, these measures have been developed with input from key stakeholders together with appropriate technical standards, policies and guidance. These embedded environmental measures include both avoidance, best practice and design commitments.

4.6 Reporting EIA assessment results

The Rampion 2 EIA process will culminate in the production of an ES written in accordance with the EIA Regulations 2017 which will help inform the determination of the application for a Development Consent Order (DCO). The ES will provide an assessment of the likely significant effects associated with the construction, operation and maintenance, and decommissioning phases of Rampion 2 which will help to inform decision-making. The EIA for a DCO is reported in two stages:

- the PEIR, prepared in order to inform the consultation with the public and other stakeholders about Rampion 2 and its likely significant environmental effects; and
- the ES, prepared to accompany the DCO Application.

The PEIR is comprised of:

- Volume 1: PEIR Chapters with all the full details of methodology and assessments;
- Volume 2: Figures to accompany each Chapter;
- Volume 3: Appendices where further information is presented in relation to the Chapters; and
- Non-Technical Summary (this document).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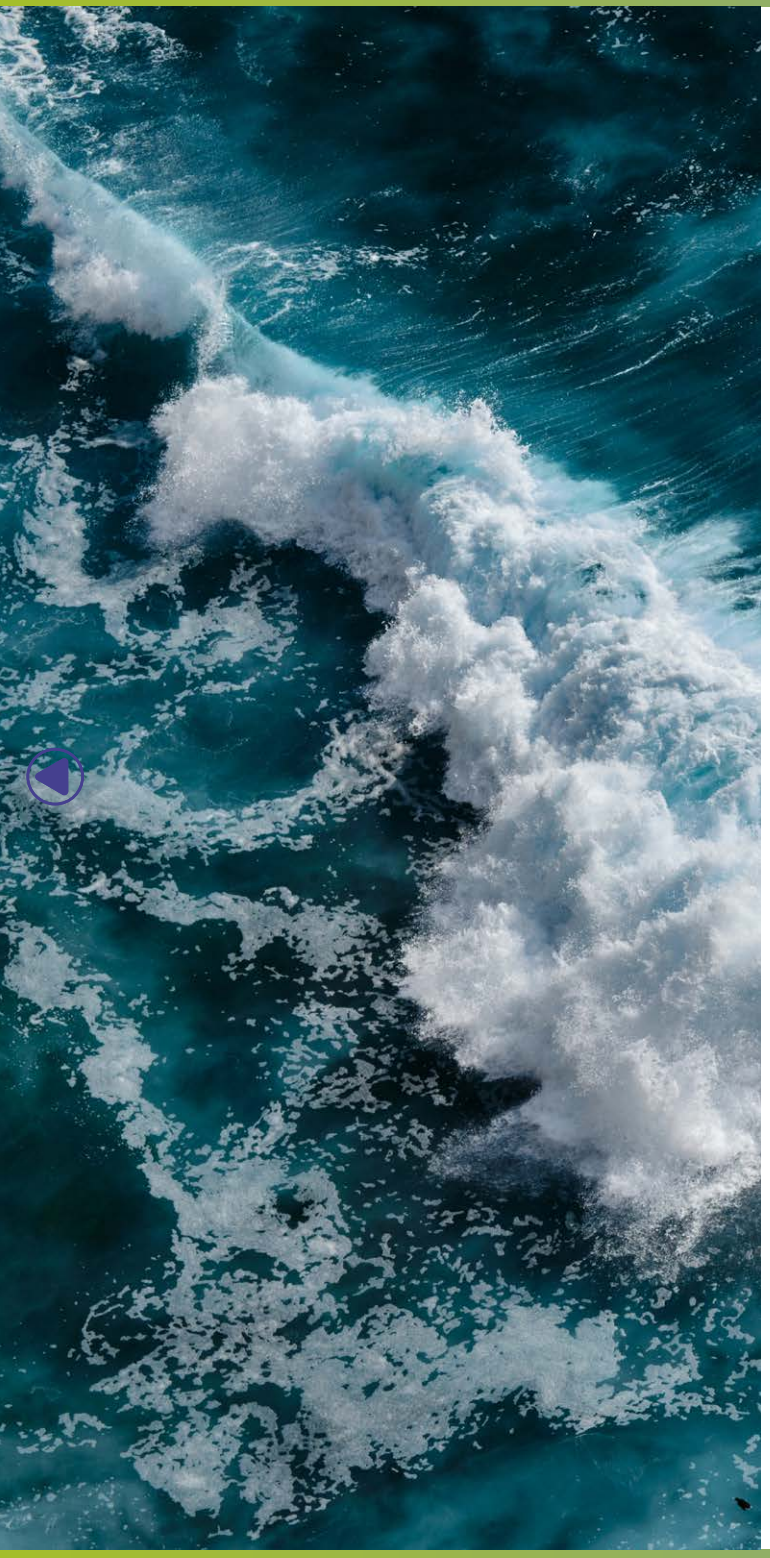
5. Preliminary environmental assessment offshore

5.1 Introduction

This section provides a summary of the preliminary assessment of likely significant effects to offshore resources and receptors including:

- coastal processes;
- other marine users;
- fish and shellfish ecology;
- benthic, subtidal and intertidal ecology;
- commercial fisheries;
- marine mammals;
- offshore ornithology;
- shipping and navigation;
- nature conservation;
- civil and military aviation;
- seascape, landscape and visual; and
- marine archaeology.

The offshore part of the PEIR Assessment Boundary is shown in Figure 1–1..



5.2 Coastal processes

This section summarises the assessment findings at this point in the EIA process for coastal processes, based on **Chapter 6: Coastal processes, Volume 2.**

How effects on coastal processes have been assessed

The preliminary assessment identifies likely significant effects on coastal processes receptors resulting from the proposed construction, operation and decommissioning of the offshore infrastructure. For the most part coastal processes are not in themselves receptors but are instead 'pathways'. However, changes to coastal processes have the potential to indirectly impact other environmental receptors. The assessment has considered impacts from:

- changes in suspended sediment concentrations (SSC) and deposition of disturbed sediments to the seabed;
- changes to the tidal, wave, sediment transport regimes and seabed scour;
- changes to landfall morphology due to installation of export cable; and
- changes to the tidal regime due to presence of windfarm infrastructure.

The spatial scope of the coastal processes assessment includes the PEIR Assessment Boundary together with the Zone of Influence (ZOI). The coastal processes ZOI combines the area where there is a potential impact on waves at adjacent coastlines between Beachy Head and Selsey Bill; and the likely extent of potential sediment plume impacts.

The information used in the PEIR has come from a variety of sources including a review of appropriate literature, obtaining relevant historical geophysical, geotechnical and benthic survey records, site specific surveys for Rampion 2 and survey results for Rampion 1, and meetings with groups such as The Environment Agency (EA), Marine Management Organisation (MMO), Centre for Environment, Fisheries and Aquaculture Science (Cefas).

Baseline environment

The preliminary assessment for coastal processes has used a desk-based approach to data collection, and site survey data from the Rampion 2 PEIR Assessment Boundary collected in 2020. The data provides evidence that water depths across the wind farm array area vary from approximately 13m below the lowest astronomical tide (mLAT) (on a rocky outcrop in the northwest of the site) to 65mLAT (within a broad depression) in the southeast on the array. Sandwaves are prevalent over much of the central and eastern array area, trending northwest to southeast, with wave heights of up to 2m relative to the surrounding seabed.

The Rampion 2 landfall is located at Climping. The beach here consists of mixed sand and shingle sediment with a 1:7.5 slope to the sand foreshore, with sediment transport in an easterly direction. There is also a failed seawall and groynes.

The seabed across the array and export cable corridor is dominated by the presence of coarse-grained sediments (sands and gravels) with outcropping bedrock in places.

Embedded environmental measures

A range of environmental measures which relate to coastal processes are embedded as part of the Rampion 2 design in order to remove or minimise significant environmental effects as far as reasonably possible. Examples of these measures include the following:

- **The selection of the foundation type will primarily be based upon the site conditions combined with the wind turbine generator that is selected.**
- **Scour protection (typically consisting of rock aggregate or stone/ concrete mattresses) may need to be installed and a Scour Protection Management Plan will be developed.**
- **The inter-array cables will typically be buried below the seabed surface.**
- **The subsea export cable ducts will be drilled underneath the beach using horizontal direction drilling (HDD) techniques.**

Likely significant effects

Overview

The preliminary assessment is based on the proposed location of the offshore infrastructure and the subsequent operation, plus the incorporation of appropriate embedded environmental measures. This identifies potential pathways which could lead to indirect impacts on other environmental receptors, during construction, operation and maintenance, and decommissioning. These impacts are considered and reported in the relevant Chapter of the PEIR, for example **Chapter 8: Fish and Shellfish Ecology, Volume 2.**

No Significant Effects have been identified at this stage to coastal processes receptors from construction, operation and maintenance and decommissioning activities.

Cumulative effects

The following have the potential to result in cumulative effects on coastal processes:

- The interaction between sediment plumes generated by Rampion 2 cable or foundation installation activities and dredge disposal operations associated with the Aquind cable. However, the preliminary assessment has identified that the potential for these plumes to interact is very low due to the distance between the activities.
- Active aggregate dredging licence areas (Inner Owers, Inner Owers North and Inner Owers Extension) are sufficiently close (within one tidal excursion distance) that an overlapping plume effect could occur. However, any cumulative changes in seabed level (different to that already assessed for Rampion 2 alone) are likely to be too small to be measurable in practice.

Having considered these potential effects, **No Significant Cumulative Effects** are anticipated at this stage from construction, operation and maintenance and decommissioning activities.

Inter-related effects

No Significant Inter-related Effects of greater significance compared to the impacts considered alone were identified at this stage for coastal processes from the construction, operation and maintenance and decommissioning of Rampion 2.

Transboundary effects

No Significant Transboundary Effects have been identified. This is because the predicted changes to the key coastal process pathways (i.e. tides, waves, and sediment transport) are not anticipated to be sufficient to influence identified receptors at this distance from Rampion 2.

Next steps

Further work that will be undertaken to support the coastal processes assessment and presented within the ES. No further baseline information is required but the data collected will continue to be reviewed through to the final ES.

Additional assessments will be undertaken to estimate the rate and direction of sediment transport at more locations within the PEIR Assessment Boundary and the wider study area. External comments received on the PEIR assessments will be addressed in the preparation of the ES.

5.3 Other marine users

This section summarises the assessment findings at this point in the EIA process for other marine users, based on **Chapter 7: Other marine users, Volume 2.**

How effects on other marine users have been assessed

The preliminary assessment identifies any likely significant effects on other marine users resulting from the proposed construction, operation and decommissioning of the offshore infrastructure.

The assessment has considered impacts from increased vessel traffic, activity or access displacement, temporary increases in suspended sediment and subsequent deposition, temporary increases in subsea noise throughout the construction and decommissioning phase. During the operational phase impacts that have been assessed include increased vessel traffic, the physical presence of infrastructure and alterations in wave energy direction and period.

The study area for the other marine users assessment includes the area over which suspended sediments may travel following disturbance as a result of Rampion 2 activities, extending 15km around the array component of the PEIR Assessment Boundary, and a distance of 10km surrounding the offshore export cable corridor.

The information used in the PEIR has come from a desk study of a variety of sources including information from The Crown Estate on offshore wind leasing sites, oil and gas, aggregates licence areas and other offshore renewable energy, Centre for Environment, Fisheries & Aquaculture Science (Cefas) data on disposal sites, offshore cable, interconnector and pipelines from the Kingfisher Information Service, MoD practice areas, recreational diving records from SeaSearch and RYA data from the boating atlas.

Baseline environment

Other marine user receptors that have been considered within this assessment include marine aggregates, disposal sites, oil and gas, offshore wind, other offshore energy, military activities and munitions, subsea cables and pipelines, recreational boating and sailing, diving and water sports (including surfing) recreational fishing and aquaculture.

Embedded environmental measures

A range of environmental measures which relate to other marine users are embedded as part of the Rampion 2 design in order to remove or minimise significant environmental effects as far as reasonably possible. Examples of these measures include the following.

- **An advisory exclusion zone around all piling operations, within which no-one (including construction personnel) is recommended to enter the water.**
- **A Diver Communication Plan will be developed in agreement with regulatory authorities to notify the diving and spearfishing community of the timing and duration of the proposed works.**
- **Scour protection (typically consisting of rock aggregate or stone/ concrete mattresses) may need to be installed and a Scour Protection Management Plan will be developed.**
- **The inter-array cables will typically be buried below the seabed surface.**
- **The subsea export cable ducts will be drilled underneath the beach using horizontal direction drilling (HDD) techniques.**

Likely significant effects

Overview

Based on the proposed location of the offshore infrastructure and the subsequent operation, plus the incorporation of appropriate embedded environmental measures, **No Significant Effects** have been identified at this stage in relation to potential impacts of Rampion 2 on other marine users from construction, operation and maintenance and decommissioning activities.

Cumulative effects

No Significant Cumulative Effects have been identified at this stage in relation to Rampion 2 on other marine users from construction, operation and maintenance and decommissioning activities. Further work is to be undertaken and an updated cumulative effects assessment will be reported in the ES.

Inter-related effects

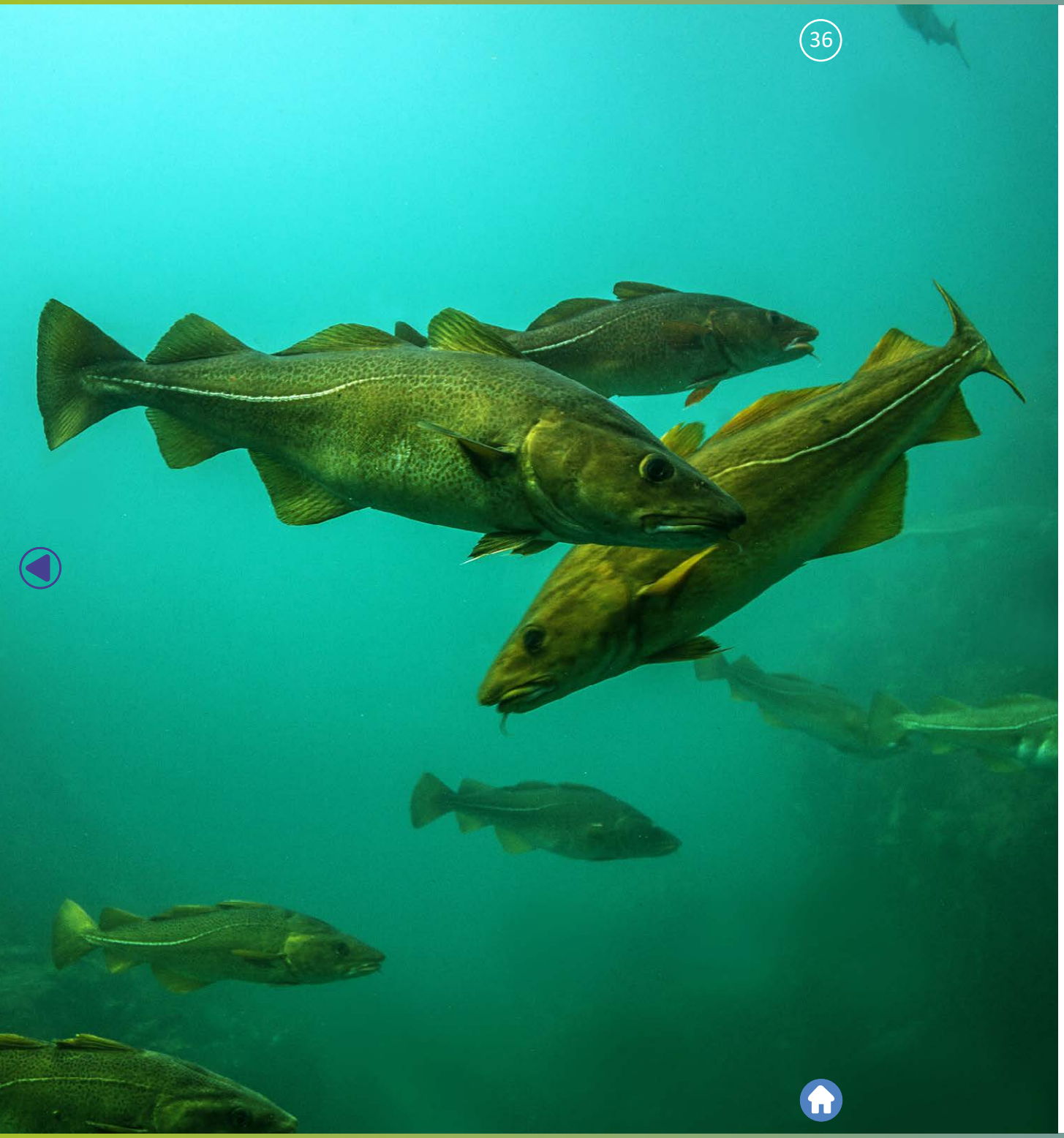
No Significant Inter-related Effects of greater significance compared to the impacts considered alone were identified at this stage for other marine users receptors from the construction, operation and maintenance and decommissioning of Rampion 2.

Transboundary effects

No Significant Transboundary Effects have been identified at this stage in relation to Rampion 2 on other marine users from construction, operation and maintenance and decommissioning activities.

Next steps

The preliminary assessment will be refined and where appropriate, updated to reflect the final Rampion 2 design which will be taken forward and presented in the ES. Further consultation and engagement will be ongoing with the relevant aggregate companies, cable operators and the MoD.



5.4 Fish and shellfish ecology

This section summarises the assessment findings at this point in the EIA process for fish and shellfish ecology, based on **Chapter 8: Fish and shellfish ecology, Volume 2.**

How effects on fish and shellfish ecology have been assessed

The preliminary assessment for fish and shellfish ecology has considered impacts from construction and decommissioning phase activities including: mortality, injury, behavioural changes and auditory masking arising from noise and vibration, direct disturbance resulting from the installation / removal of the export cable and from construction / decommissioning within the array, temporary localised increases in suspended sediment concentration (SSC) and smothering, direct and indirect seabed disturbances leading to the release of sediment contaminants. During the operational phase, impacts that have been assessed include long-term loss of habitat and increased hard substrate and structural complexity due to the presence of turbine foundations, scour protection and cable protection; electromagnetic field (EMF) impacts arising from cables; and direct disturbance resulting from maintenance within the array area and export cable.

The study area for the fish and shellfish ecology assessment includes the area over which suspended sediments may travel following disturbance as a result of Rampion 2 activities, extending 15km around the array part of the PEIR Assessment Boundary, and a distance of 10km surrounding the offshore export cable corridor. This area has been extended where relevant based on information on the potential for noise generated during the construction of Rampion 2 to affect sensitive fish and shellfish receptors.

The information used in the PEIR has come from a variety of sources including a review of appropriate literature, obtaining relevant historical geophysical, geotechnical and fish and shellfish survey records, including survey results for Rampion 1, and meetings with groups such as Natural England, MMO, Cefas, EA, The Wildlife Trust (TWT), Sussex Wildlife Trust (SWT) and Sussex Inshore Fisheries and Conservation Authorities (IFCA).

Baseline environment

It was agreed with stakeholders through the EIA EPP that further fish and shellfish surveys are not required, as sufficient information exists to enable a robust characterisation of the receiving environment and identification of relevant valued ecological receptors for the purposes of assessment.

The preliminary assessment for fish and shellfish ecology has used a desk-based approach to data collection, and site-specific geophysical survey data from the Rampion 2 PEIR Assessment Boundary collected in 2020, have also been considered. The geophysical survey data has provided important additional ground discrimination information and have been used to supplement several existing regional datasets on likely black bream nesting locations in areas relevant to Rampion 2, the composite has been agreed as adequate for the purpose of characterising the receiving environment and informing the EIA as part of the EPP.

Many species of fish and shellfish are known to either spawn or have nursery areas in relatively close proximity to, or potentially overlapping with the PEIR Assessment Boundary. Various data sources and further details are provided in the main chapter of the PEIR.

Fish and shellfish ecology receptors that have been considered within the assessment include the following:

- mobile fish species;
- elasmobranch species;
- migratory species; and
- shellfish.

Embedded environmental measures

A range of environmental measures which relate to fish and shellfish ecology are embedded as part of the Rampion 2 design in order to remove or reduce significant environmental effects as far as reasonably possible. Examples of these measures include the following:

- **A Scour Protection Management Plan will be developed. It will include details of the need, type, quantity and installation methods for scour protection.**
- **A Marine Pollution Contingency Plan will be developed and will outline procedures to protect personnel working and to safeguard the marine environment.**
- **Mitigation and control of invasive species measures will be incorporated into a Project Environmental Monitoring Programme.**

Likely significant effects

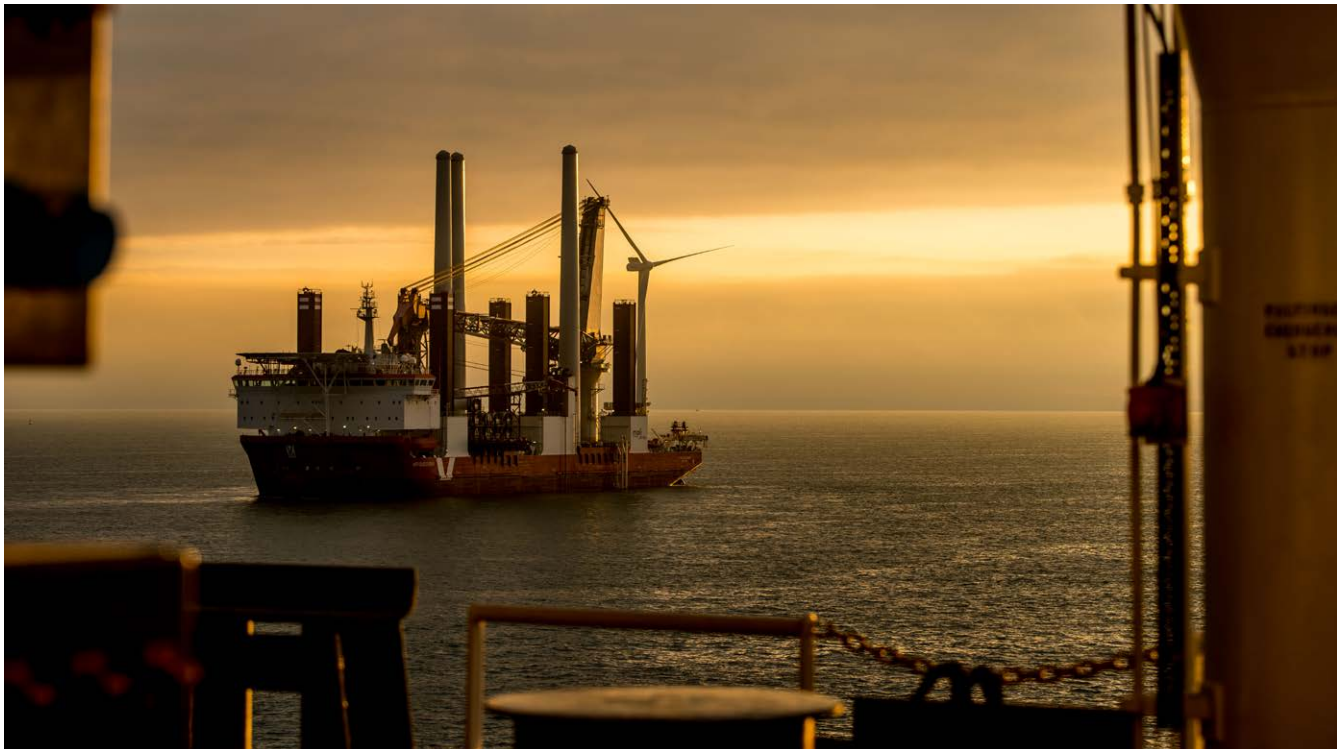
Overview

Based on the proposed location of the offshore infrastructure and the subsequent operation, plus the incorporation of appropriate embedded environmental measures, **No Significant Effects** have been identified at this stage in relation to potential impacts of Rampion 2 on the majority of fish and shellfish ecology receptors from construction, operation and maintenance and decommissioning activities.

However, in the absence of further mitigation, **Potential Significant Effects** have been identified in all project phases for black bream:

- mortality, injury, behavioural changes and auditory masking arising from noise and vibration (construction);
- direct disturbance resulting from the installation / removal of the export cable (construction and decommissioning);
- temporary localised increases in SSC and smothering (construction); and
- long-term loss of habitat due to the presence of turbine foundations, scour protection and cable protection (operation and maintenance).

Further mitigation options are being considered to make it possible to reduce the level of effect to a not significant level for the ES.



Cumulative effects

No Significant Cumulative Effects have been identified at this stage in relation to Rampion 2 on fish and shellfish ecology from construction, operation and maintenance, and decommissioning activities. Further work is to be undertaken and an updated cumulative effects assessment will be reported in the ES.

Inter-related effects

No Significant Inter-related Effects of greater significance compared to the impacts considered alone were identified at this stage for fish and shellfish receptors from the construction, operation and maintenance, and decommissioning of Rampion 2.

Transboundary effects

No Significant Transboundary Effects have been identified at this stage in relation to Rampion 2 on fish and shellfish ecology from construction, operation and maintenance, and decommissioning activities.

Next steps

The preliminary assessment will be refined and where appropriate, updated to reflect the final Rampion 2 design which will be taken forward and presented in the ES. Further consultation and engagement will be ongoing with the relevant stakeholders, including the MMO, Cefas, Natural England, EA, TWT, SWT and Sussex IFCA. External comments received on the PEIR assessments will be addressed in the preparation of the ES.

5.5 Benthic, subtidal and intertidal ecology

This section summarises the assessment findings at this point in the EIA process for benthic, subtidal and intertidal ecology, based on **Chapter 9: Benthic, subtidal and intertidal ecology, Volume 2.**

How effects on benthic, subtidal and intertidal ecology have been assessed

The preliminary assessment identifies likely significant effects on benthic, subtidal and intertidal ecology receptors resulting from the proposed construction, operation and decommissioning of the offshore infrastructure.

The assessment has considered impacts from construction and decommissioning phase activities including: temporary habitat disturbance in the PEIR Assessment Boundary array area and offshore export cable corridor from construction / decommissioning activities; temporary increase in suspended sediment and sediment deposition in the PEIR Assessment Boundary array area and offshore export cable corridor; temporary increase in SSCs and sediment deposition in the intertidal area; direct and indirect seabed disturbances leading to the release of sediment contaminants; increased risk of introduction or spread of Marine Invasive Non-Native Species (INNS); indirect disturbance arising from the accidental release of pollutants; and indirect disturbance from increased noise and vibration from construction activities.

During the operational phase, impacts that have been assessed include; long-term habitat loss/ alteration from the presence of foundations, scour protection and cable protection; temporary habitat disturbance from jack-up vessels and cable maintenance activities; changes to seabed habitats arising from effects on physical processes, including scour effects and changes in the sediment transport and wave regimes; colonisation of the WTG and scour/ cable protection; increased risk of introduction or spread of Marine INNS due to presence of infrastructure and vessel movements (for example the discharge of ballast water); indirect disturbance arising from the accidental release of pollutants; and indirect disturbance arising from EMF generated by the current flowing through the cables buried to <1.5m below the surface.

The study area for the benthic, subtidal and intertidal ecology assessment includes the area over which suspended sediments may travel following disturbance as a result of Rampion 2 activities, extending 15km around the array component of the PEIR Assessment Boundary, and a distance of 10km surrounding the offshore export cable corridor.

The information used in the PEIR has come from a variety of sources including a review of appropriate literature, obtaining relevant historical geophysical, geotechnical, including survey results for Rampion 1, site-specific Rampion 2 geophysical, intertidal and subtidal

surveys, and meetings with groups such as Natural England, MMO, Cefas, EA, TWT, SWT and East Sussex County Council (ESCC).

Baseline environment

The preliminary assessment for benthic, subtidal and intertidal ecology has used a desk-based approach to data collection including existing data, such as the Rampion 1 offshore wind farm, Regional Seabed Monitoring Plan baseline datasets and European Nature Information System habitat classifications, and the newly acquired site-specific geophysical datasets that form the base data for the predictive habitat mapping to present detailed information on the distribution of sediments, biological zones and biotopes across the PEIR Assessment Boundary. Benthic subtidal ecology site specific surveys and associated reporting will be available for inclusion into the ES.

Existing data shows that the sediments within the western section of the PEIR Assessment Boundary and offshore export cable corridor are predominantly characterised by coarse and mixed sediments, with the eastern area identified as having a greater proportion of sand and muddy sand sediments.

The predictive habitat modelling revealed that seven biotopes were identified as occurring throughout the PEIR Assessment Boundary from a total of seven broadscale habitats. Habitat and biotope mapping of the intertidal area across the intertidal ecology study area revealed that there was a total of nine unique biotopes (EUNIS level 5 or above) from a total of four broadscale habitats.

Site-specific sediment contaminant data from across the PEIR Assessment Boundary will be presented within the final ES.

Benthic, subtidal and intertidal ecology receptors that have been considered within the assessment include broadscale habitat features, features of Marine Conservation Zones (MCZs) and broadscale features of MCZ. The list of receptors will be kept under review during the EIA as more detailed information is obtained from the site-specific surveys undertaken as well as any relevant data available from other aspects (technical topics), which will be reflected in the final ES.

Embedded environmental measures

A range of environmental measures which relate to benthic, subtidal and intertidal ecology are embedded as part of the Rampion 2 design in order to remove or reduce significant environmental effects as far as reasonably possible. Examples of these measures include the following:

- **A Scour Protection Management Plan will be developed. It will include details of the need, type, quantity, and installation methods for scour protection.**
- **The inter-array cables will typically be buried below the seabed surface.**
- **The subsea export cable ducts will be drilled underneath the beach using horizontal directional drilling (HDD) techniques.**
- **The proposed offshore export cable corridor and cable landfall (below mean high water springs [MHWS]) will avoid all statutory marine designated areas.**
- **An Outline Marine Pollution Contingency Plan (MPCP) will be developed. This MPCP will outline procedures to protect personnel working and to safeguard the marine environment.**
- **Mitigation and control of invasive species measures will be incorporated into a Project Environmental Monitoring Programme.**

Likely significant effects

Overview

Based on the proposed location of the offshore infrastructure and its subsequent operation, plus the incorporation of appropriate environmental measures, **No Significant Effects** have been identified at this stage in relation to potential impact of Rampion 2 on benthic, subtidal and intertidal ecology from the construction, operation and maintenance, and decommissioning of Rampion 2.

Cumulative effects

No Significant Cumulative Effects have been identified at this stage in relation to Rampion 2 on benthic, subtidal and intertidal ecology from construction, operation and maintenance, and decommissioning activities. Further work is to be undertaken and an updated cumulative effects assessment will be reported in the ES.

Inter-related effects

No Significant Inter-related Effects of greater significance compared to the impacts considered alone were identified at this stage for benthic, subtidal and intertidal ecology receptors from the construction, operation and maintenance, and decommissioning of Rampion 2.

Transboundary effects

No Significant Transboundary Effects have been identified at this stage in relation to Rampion 2 on benthic, subtidal and intertidal ecology from construction, operation and maintenance, and decommissioning activities.

Next steps

The preliminary assessment will be refined and where appropriate, updated to reflect the final Rampion 2 design which will be taken forward and presented in the ES. Further work will be undertaken to support the benthic, subtidal and intertidal ecology assessment. This will include analysis of the results of the site-specific subtidal data that has been collected across the PEIR Assessment Boundary and updating the predictive habitat model to include the site-specific ground-truthing results, which will be available for inclusion into the ES. Further consultation and engagement will be ongoing with the relevant stakeholders, including the MMO, Cefas, Natural England, EA, TWT, SWT and ESCC. External comments received on the PEIR assessments will be addressed in the preparation of the ES.

5.6 Commercial fisheries

This section summarises the assessment findings at this point in the EIA process for commercial fisheries, based on **Chapter 10: Commercial fisheries, Volume 2.**

How effects on commercial fisheries have been assessed

The preliminary assessment of commercial fisheries has considered impacts from construction and decommissioning phase activities including; reduction in access to, or exclusion from established fishing grounds; displacement leading to gear conflict and increased fishing pressure on adjacent grounds; disturbance of commercially important fish and shellfish resources leading to displacement or disruption of fishing activity; increased vessel traffic associated with Rampion 2 within fishing grounds leading to interference with fishing activity; and additional steaming to alternative fishing grounds for vessels that would otherwise fish within the Rampion 2 area.

During the operational phase, impacts that have been assessed include; reduction in access to, or exclusion from established fishing grounds; displacement leading to gear conflict and increased fishing pressure on adjacent grounds; disturbance of commercially important fish and shellfish resources leading to displacement or disruption of fishing activity; increased vessel traffic associated with Rampion 2 within fishing grounds leading to interference with fishing activity; additional steaming to alternative fishing grounds for vessels that would otherwise fish within the Rampion 2 area; and physical presence of infrastructure leading to gear snagging.

The study area for the commercial fisheries assessment is located within the northern portion of the International Council for the Exploration of the Sea (ICES) Division 7d (eastern English Channel) statistical area, defined as ICES rectangle 30E9. The PEIR Assessment Boundary occupies only a portion of this ICES rectangle, equating to 14% of the surface area.

The information used in the PEIR has come from a variety of sources including a review of appropriate literature, obtaining UK and European data sources, such as Government agencies, research bodies and directly from the fishing industry and its representative organisations and informal engagement with groups such as the National Federation of Fishermen's Organisations (NFFO), Sussex IFCA, Brighton and Newhaven Fish Sales & Leach Fishing, and FROM Nord (French Producer Organisation).

Baseline environment

The preliminary assessment for commercial fisheries has used a desk-based approach to data collection, using the most recent datasets available at the time of writing (2012-2016 for EU Data Collection Framework (DCF) data; 2015-2019 for MMO data; 2017 for ICES Vessel Monitoring System (VMS) data and 2017 for MMO VMS data). This includes landings from the Rampion 2 commercial fisheries study area (i.e., ICES rectangles 30E9),

analysis on a fishery-by-fishery basis, where details on the nationality of vessels, species caught, and location of fishing activity is provided.

Commercial fisheries receptors that have been considered within the assessment include the following:

- potting fleet (i.e. vessels fishing with pots and traps);
- dredging fleet (i.e. vessels fishing with dredges);
- netting fleet (i.e. vessels fishing with nets);
- beam trawl fleet (i.e. vessels fishing with beam trawls);
- demersal otter trawl fleet (i.e. vessels fishing with demersal trawls); and
- pelagic trawl fleet (i.e. vessels fishing with pelagic trawls).

Embedded environmental measures

A range of environmental measures which relate to commercial fisheries are embedded as part of the Rampion 2 design in order to remove or reduce significant environmental effects as far as reasonably possible. Examples of these measures include the following:

- **Where possible, cable burial will be the preferred option for cable protection.**
- **RED will comply with legal requirements with regards to shipping, navigation and aviation marking and lighting.**
- **Advance warning and accurate location details of construction, maintenance and decommissioning operations, associated Safety Zones and advisory passing distances will be given via Notices to Mariners (NtM) and Kingfisher Bulletins.**
- **Ongoing liaison with fishing fleets will be maintained during all stages of the Proposed Development.**
- **RED will develop an Outline Fisheries Liaison and Coexistence Plan which will facilitate the relationship between the local fishing fleets and the Proposed Development.**

Likely significant effects

Overview

Based on the proposed location of the offshore infrastructure and its subsequent operation, plus the incorporation of appropriate environmental measures, **No Significant Effects** have been identified at this stage in relation to potential impact of Rampion 2 on commercial fisheries from the construction, operation and maintenance, and decommissioning of Rampion 2.

Cumulative effects

No Significant Cumulative Effects have been identified at this stage in relation to Rampion 2 on commercial fisheries from construction, operation and maintenance, and decommissioning activities. Further work is to be undertaken and an updated cumulative effects assessment will be reported in the ES.

Inter-related effects

No Significant Inter-related Effects of greater significance compared to the impacts considered alone were identified at this stage for commercial fisheries receptors from the construction, operation and maintenance, and decommissioning of Rampion 2.

Transboundary effects

No Significant Transboundary Effects have been identified at this stage in relation to Rampion 2 on commercial fisheries from construction, operation and maintenance, and decommissioning activities.

Next steps

The preliminary assessment will be refined and where appropriate, updated to reflect the final Rampion 2 design which will be taken forward and presented in the ES. Further engagement will be ongoing with the relevant stakeholders, including the NFFO, Sussex IFCA, Brighton and Newhaven Fish Sales & Leach Fishing and FROM Nord. External comments received on the PEIR assessments will be addressed in the preparation of the ES.

5.7 Marine mammals

This section summarises the assessment findings at this point in the EIA process for marine mammals, based on **Chapter 11: Marine mammals, Volume 2**.

How effects on marine mammals has been assessed

The preliminary assessment marine mammals has considered impacts from construction and decommissioning phase activities including, construction / decommissioning noise impacts (including Permanent Threshold Shift (PTS) and disturbance); vessel collision risk; vessel disturbance; changes in prey availability; and disturbance to seal haul out sites at landfall. During the operational phase, impacts that have been assessed include, operational noise impacts; vessel collision risk; and vessel disturbance.

The study area for the marine mammal assessment has been characterised by the PEIR Assessment Boundary together with the ZOI, which has been defined by the potential for a significant effect to occur from underwater noise, but also by wider Management Unit (MU) extents. This includes the proposed development marine mammal survey area, which extended across the majority of the offshore PEIR Assessment Boundary plus a 4km buffer.

The information used in the PEIR has come from a variety of sources including a review of appropriate literature, obtaining relevant historical data records, including survey results for Rampion 1 and site-specific Rampion 2 surveys conducted from April 2019 to March 2021, and meetings with groups such as Natural England, MMO, Cefas, TWT and Whale and Dolphin Conservation (WDC).

Baseline environment

The preliminary assessment for marine mammal species present was informed through a combination of literature reviews and data obtained from site-specific surveys to determine marine mammal density estimates and to obtain reference population information. The main species present during the site-specific surveys was the harbour porpoise with some sightings of common dolphins, seal species and unidentified small cetacean.

Marine mammal receptors that have been considered within the assessment include any marine mammals present within the study area - harbour porpoise, common dolphin, bottlenose dolphin, minke whale, harbour seal and grey seal.

Embedded environmental measures

A range of environmental measures which relate to marine mammals are embedded as part of the Rampion 2 design in order to remove or reduce significant environmental effects as far as reasonably possible. Examples of these measures include the following.

- **A Vessel Management Plan will be developed pre-construction.**
- **A piling Marine Mammal Mitigation Protocol will be implemented during construction and will include details of soft starts to be used during piling operations.**
- **A Decommissioning Marine Mammal Mitigation Protocol will be implemented in line with the latest relevant available guidance.**
- **A Marine Pollution Contingency Plan will be developed and will outline procedures to protect personnel working and to safeguard the marine environment.**
- **Mitigation and control of invasive species measures will be incorporated into a Project Environmental Managmement Plan.**

Likely significant effects

Overview

Based on the proposed location of the offshore infrastructure and its subsequent operation, plus the incorporation of appropriate environmental measures, **No Significant Effects** have been identified at this stage in relation to potential impact of Rampion 2 on marine mammals from the construction, operation and maintenance, and decommissioning of Rampion 2.

Cumulative effects

No Significant Cumulative Effects have been identified at this stage in relation to Rampion 2 on marine mammals from construction, operation and maintenance, and decommissioning activities. Further work is to be undertaken and an updated cumulative effects assessment will be reported in the ES.

Inter-related effects

No Significant Inter-related Effects of greater significance compared to the impacts considered alone were identified at this stage for marine mammal receptors from the construction, operation and maintenance, and decommissioning of Rampion 2.

Transboundary effects

No Significant Transboundary Effects have been identified at this stage in relation to Rampion 2 on marine mammals from construction, operation and maintenance, and decommissioning activities.

Next steps

The preliminary assessment will be refined and where appropriate, updated to reflect the final Rampion 2 design which will be taken forward and presented in the ES. Further work will be undertaken to support the marine mammal assessment. This will include analysis of the results of the additional nine months of data which was unavailable for PEIR and if required an update to the cetacean MU following the release of the Inter-Agency Marine Mammal Working Group (IAMMWG) 2021 report. Further consultation and engagement will be ongoing with the relevant stakeholders, including the MMO, Cefas, Natural England, TWT and WDC. External comments received on the PEIR assessments will be addressed in the preparation of the ES.

5.8 Offshore and intertidal ornithology

This section summarises the assessment findings at this point in the EIA process for offshore and intertidal ornithology, based on **Chapter 12: Offshore and intertidal ornithology, Volume 2.**

How effects on offshore and intertidal ornithology have been assessed

The preliminary assessment identifies likely significant effects on bird species resulting from the proposed construction, operation and decommissioning of the offshore infrastructure. The assessment has considered impacts from disturbance and displacement of birds, and indirect impacts on bird species due to impacts on prey species habitat loss. During the operational phase impacts that have been assessed include collision risk with rotating WTG blades and barrier effects (i.e. blocking of flight paths from the wind. The study area for the offshore and intertidal ornithology assessment includes the area in which the WTGs will be located with a 4km buffer, the export cable corridor and the cable landfall area.

The information used in the PEIR has come from a variety of sources including a review of appropriate literature, obtaining relevant historical bird survey records, including bird survey results for Rampion 1, descriptions of wildlife sites gained through desk study, intertidal and offshore bird surveys, and meetings with groups such as Natural England (the government's advisory body on the natural environment) and other organisations which are interested in ornithology including the Marine Management Organisation (MMO), Centre for Environment, Fisheries and Aquaculture Science (Cefas), Sussex Ornithology Society, The Wildlife Trusts, Adur and Worthing District Councils, Natural England, and The Royal Society for the Protection of Birds (RSPB).

Baseline environment

The preliminary assessment for the intertidal environment has used a desk-based approach to data collection, and survey data from the first 12 surveys undertaken have also been considered. The data provides evidence that waterbird occurrence is generally very low on a regional and national scale within the intertidal environment at the proposed landfall area, with only sanderling and Mediterranean gull being found in sufficient numbers to warrant further consideration.

For the offshore environment, a programme of 24 months of aerial digital surveys has been completed in order to determine the type and numbers of birds present in and around the wind farm. Data from the first 15 months of surveys has identified a total of 21 different bird species.

Key species recorded in the greatest numbers being fulmar, gannet, kittiwake, little gull, common gull, herring gull, great black-backed gull, lesser black-backed gull guillemot, sandwich tern, 'commic' tern, guillemot and razorbill. Although not observed within the study area in the aerial digital surveys, based on other data sources considered (particularly the Rampion 1 ES), great skua has also been considered in the preliminary assessment.

Embedded environmental measures

A range of environmental measures which relate to offshore and intertidal ornithology are embedded as part of the Rampion 2 design to remove or reduce significant environmental effects as far as possible. Examples of these measures include the following:

- **The proposed offshore cable corridor and cable landfall (below mean high water springs [MHWS]) will avoid all statutory marine designated areas.**
- **Horizontal Directional Drill (HDD) technique will be used at the landfall location.**
- **Development of, and adherence to, a Code of Construction Practice to reduce direct and indirect disturbance and displacement effects to ornithological features.**

Likely significant effects

Overview

Based on the proposed location of the offshore infrastructure and its subsequent operation, plus the incorporation of appropriate environmental measures, **No Significant Effects** have been identified at this stage in relation to potential impact of Rampion 2 on offshore and intertidal ornithology from the construction, operation and maintenance, and decommissioning of Rampion 2.

Cumulative effects

There is potential for cumulative collision risk to birds as a result of operational activities associated with Rampion 2 and other developments. The risk to birds is through potential collision with WTGs and other associated offshore wind farm infrastructure, resulting in injury or fatality. The preliminary assessment has identified that there is a **Potentially Significant Effect** on great black-backed gull as a consequence of cumulative collision risk from Rampion 2 and other UK offshore wind farms in the UK south-west and the English Channel. However, the contribution from Rampion 2 is considered to be minimal. No other significant cumulative effects to any other bird species have been identified. Further work is to be undertaken and an updated cumulative effects assessment will be reported in the ES.

Inter-related effects

No Significant Inter-related Effects of greater significance compared to the impacts considered alone were identified at this stage for offshore and intertidal ornithology from the construction, operation and maintenance, and decommissioning of Rampion 2.

Transboundary effects

Transboundary effects arise when impacts from a development within one state affects the environment of another state(s). Transboundary effects on ornithological receptors (seaward of the MHWS) are possible due to the wide foraging and migratory ranges of typical bird species in the English Channel. There is **Some Limited Potential** for collisions and displacement at offshore wind farms outside UK territorial waters.

Next steps

The preliminary assessment will be refined and where appropriate updated to reflect the Rampion 2 design to be taken forward, and reported in the ES. Further work will be undertaken to support the offshore and intertidal ornithology assessment. This will include analysis of the results of surveys of the intertidal and near-shore environment and of aerial digital survey data of the offshore area to further characterise the baseline. In addition, an assessment of the potential collision risk to migratory seabirds and non-seabirds will be carried out as will a population viability analysis to inform the cumulative effects assessment for gannet. Further consultation and engagement will also be undertaken to inform the offshore and intertidal ornithology assessment.

5.9 Shipping and navigation

This section summarises the assessment findings at this point in the EIA process for shipping and navigation, based on **Chapter 13: Shipping and navigation, Volume 2.**

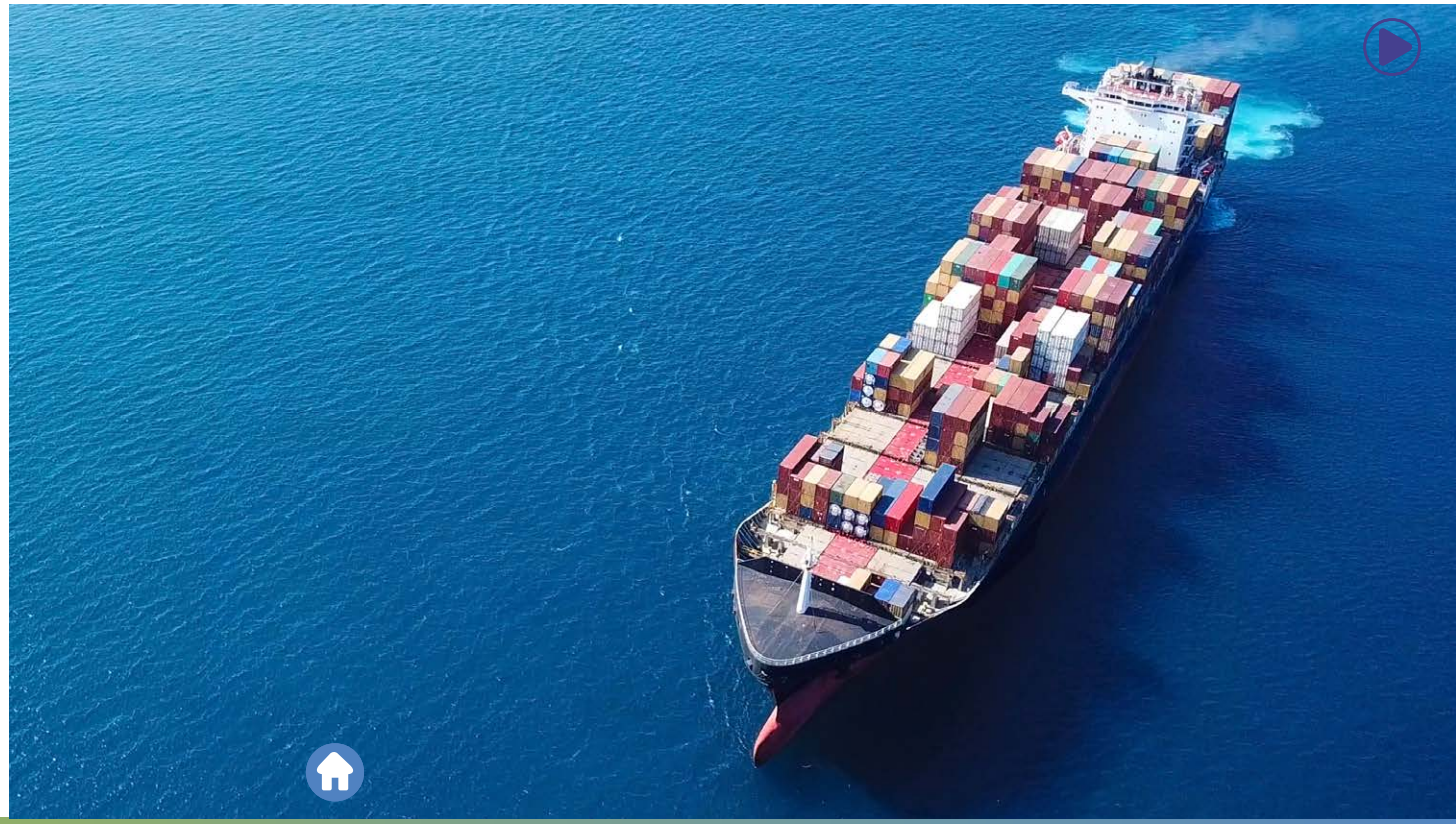
How effects on shipping and navigation has been assessed

The preliminary assessment has considered impacts from construction and decommissioning phase activities on shipping and navigation including, construction / decommissioning activities associated with the installation / removal of structures and cables may displace existing routes/activity, increase grounding risk, increase encounters and collision risk with other third-party vessels; vessels associated with construction/ decommissioning activities may increase encounters and collision risk for other vessels already operating in the area; and construction / decommissioning activities associated with the installation of structures and cables may displace existing routes/activity restricting access to ports.

During the operational phase, impacts that have been assessed include, presence of structures may displace existing routes/activity, increase grounding risk, increase encounters and collision risk with other third-party vessels; vessels associated with operation and maintenance activities may increase encounters and collision risk for other vessels already operating in the area; presence of structures in the offshore environment may increase allision risk for vessels (both powered and drifting); presence of structures in the offshore environment may displace existing routes/activity restricting access to ports and prevent use of existing Aids to Navigation; presence of export and inter array cable protection in the offshore environment may reduce charted water depths creating underwater allision risk; presence of export and inter array cables in the offshore environment may increase the potential for interaction with subsea cables; and presence of structures in the offshore environment including increased vessel activity and personnel numbers may reduce emergency response capability by increasing the number of incidents, increase consequences or reducing access for the responders.

The study area for the shipping and navigation assessment defined as a minimum 10nm buffer of the PEIR Assessment Boundary, which is considered standard and has been used within the majority of shipping and navigation assessments for UK offshore wind farms.

The information used in the PEIR has come from a variety of sources including vessel traffic movements and historical incidents within and in proximity to the PEIR Assessment Boundary and site-specific vessel traffic surveys. Other data used to inform the baseline (including the navigational features in the region) have not been restricted to the study area.



Baseline environment

The preliminary assessment for shipping and navigation was informed through a combination of reviewing data records and data obtained from site-specific surveys to determine main navigational features, vessel traffic, main commercial routes and maritime incidents within the PEIR Assessment Boundary.

Shipping and navigation receptors that have been considered within the assessment include the following:

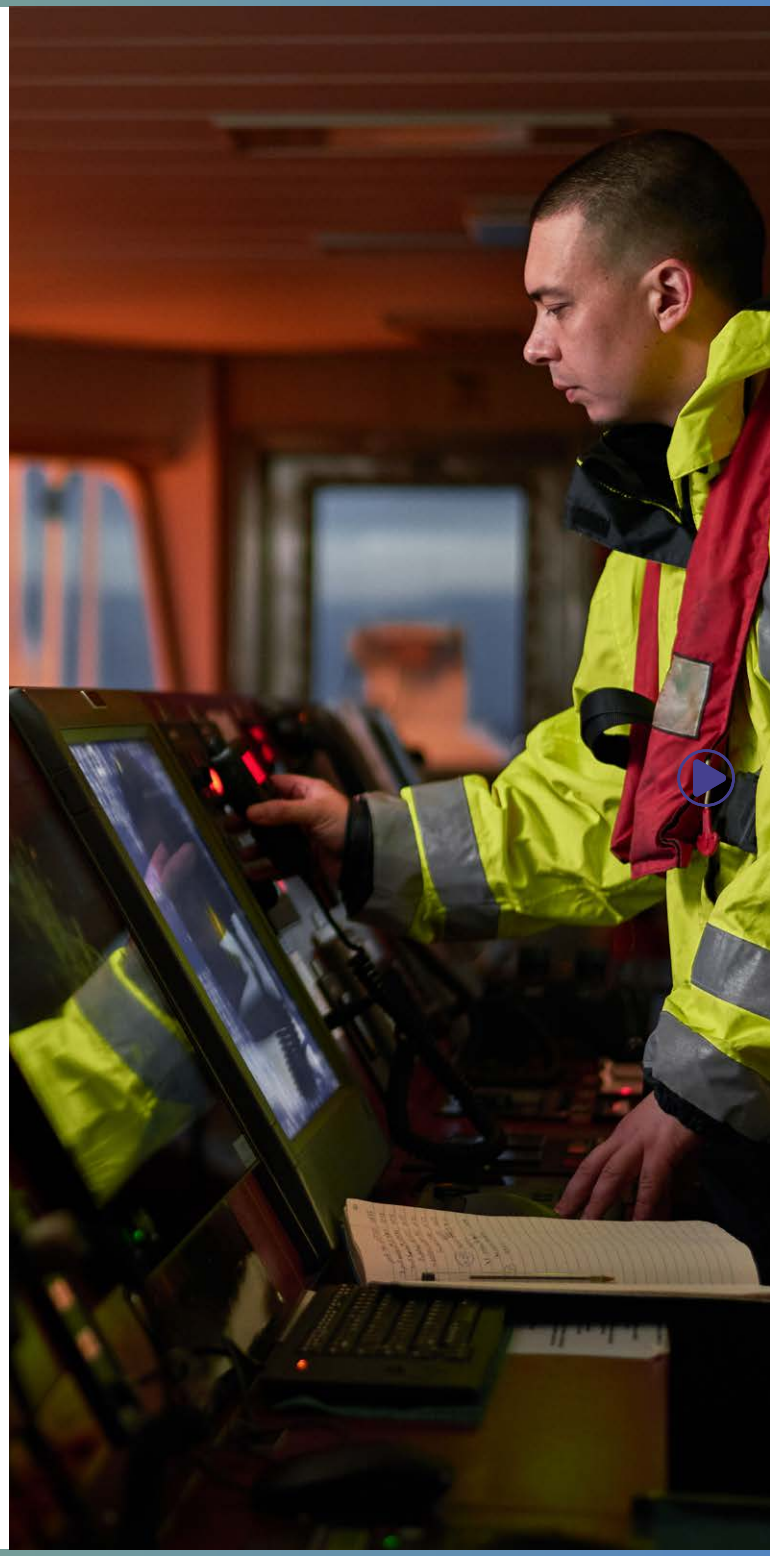
- commercial vessels;
- recreational vessels (2.4 to 24m length);
- commercial fishing vessels;
- military vessels; and
- UK emergency responders.

The list of receptors will be kept under review during the EIA as more detailed information is obtained during baseline surveys and other forms of data collection by other aspects and will be reflected in the final ES.

Embedded environmental measures

A range of environmental measures which relate to shipping and navigation are embedded as part of the Rampion 2 design to remove or reduce significant environmental effects as far as possible. Examples of these measures include the following:

- **The array cables will typically be buried below the seabed surface.**
- **Advance warning and accurate location details of construction, maintenance and decommissioning operations, associated Safety Zones and advisory passing distances will be given via Notice to Mariners and Kingfisher Bulletins.**
- **Monitoring of vessel traffic will be undertaken for the duration of the construction and maintenance periods.**
- **Ongoing liaison with fishing fleets will be maintained during all stages of the Proposed Development via an appointed Fisheries Liaison Officer and Fishing Industry Representative.**
- **A Marine Pollution Contingency Plan will be developed and will outline procedures to protect personnel working and to safeguard the marine environment.**
- **RED will exhibit lights, marks, sounds, signals and other aids to navigation as required by Trinity House, Maritime & Coastguard Agency (MCA) and Civil Aviation Authority (CAA).**
- **There will be a minimum blade tip clearance of at least 22m above Highest Astronomical Tide (HAT).**



Likely significant effects

Overview

Based on the proposed location of the offshore infrastructure and its subsequent operation, plus the incorporation of appropriate environmental measures, **No Significant Effects** have been identified at this stage in relation to potential impact of Rampion 2 on shipping and navigation from the construction, operation and maintenance, and decommissioning of Rampion 2.

Cumulative effects

For shipping and navigation, no definitive ZOI of the PEIR Assessment Boundary has been applied for the cumulative effects assessment to ensure direct and indirect cumulative effects can be appropriately identified and assessed. Instead, other developments up to 60nm from the PEIR Assessment Boundary are considered on a case-by-case basis. No developments have been scoped into the CEA. In the case of other planned offshore wind farms, and oil and gas infrastructure this is due to the distance from the PEIR Assessment Boundary. In the case of exploration areas for marine aggregate dredging this is either due to the distance from the PEIR Assessment Boundary or limited interaction with traffic that may be displaced by Rampion 2. Therefore, **No Significant Cumulative Effects** have been identified at this stage. This will be reviewed for the ES. Further work is to be undertaken and an updated cumulative effects assessment will be reported in the ES.

Inter-related effects

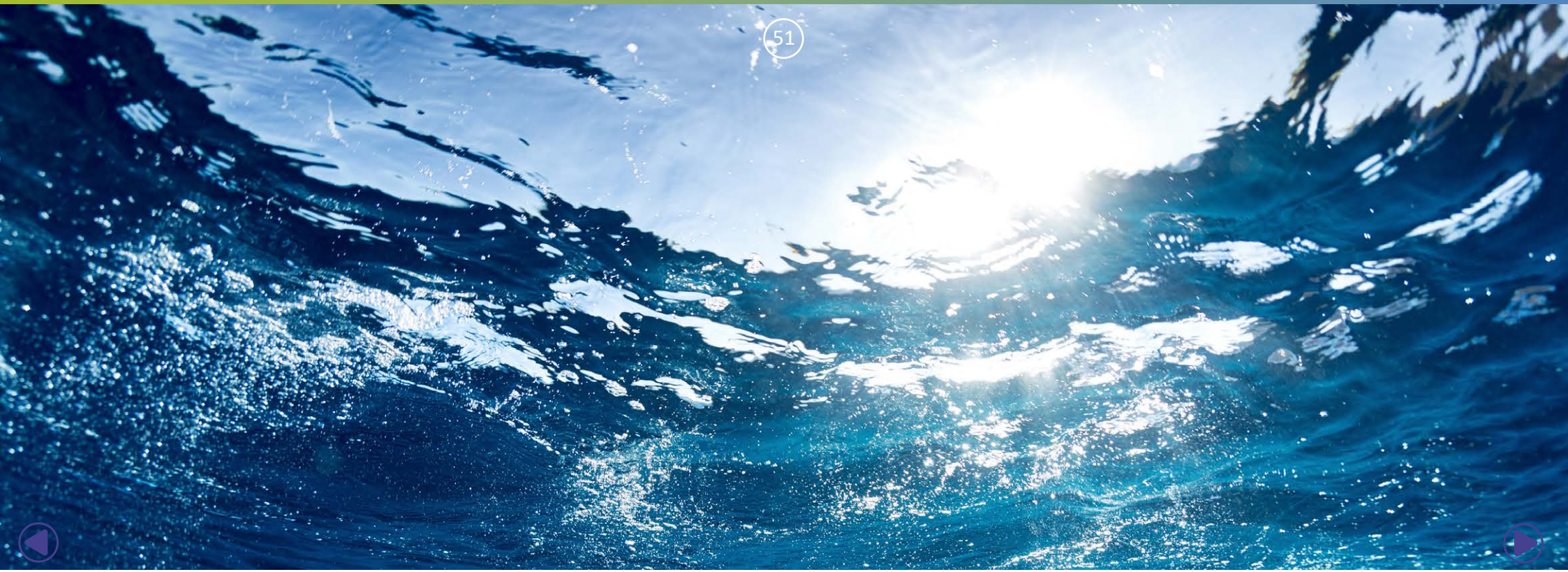
No Significant Inter-related Effects of greater significance compared to the impacts considered alone were identified at this stage for shipping and navigation receptors from the construction, operation and maintenance, and decommissioning of Rampion 2.

Transboundary effects

No Significant Transboundary Effects have been identified at this stage in relation to Rampion 2 on shipping and navigation from construction, operation and maintenance, and decommissioning activities.

Next steps

The preliminary assessment will be refined and where appropriate, updated to reflect the final Rampion 2 design which will be taken forward and presented in the ES. Further work will be undertaken to support the shipping and navigation assessment. This will include analysis of any new maritime incident data and incorporated into the ES. A consequences assessment will be undertaken and will be incorporated into the Navigational Risk Assessment (NRA). Further consultation and engagement will be ongoing with the relevant stakeholders, including the MCA, Trinity House, Royal Yachting Association (RYA) and the Dover Strait User Group. External comments received on the PEIR assessments will be addressed in the preparation of the ES.



5.10 Nature conservation

This section summarises the assessment findings at this point in the EIA process for nature conservation, based on **Chapter 14: Nature conservation, Volume 2.**

How effects on nature conservation has been assessed

The preliminary assessment identifies likely significant effects on nature conservation receptors resulting from the proposed construction, operation and decommissioning of the offshore infrastructure. These are described within the respective technical chapters that consider these potentially affected receptors, which are coastal processes, fish and shellfish ecology, benthic, subtidal and intertidal ecology, marine mammals and offshore ornithology.

The study area is defined by the individual technical disciplines:

- a 15km buffer around the PEIR Assessment Boundary and 10km surrounding the offshore cable corridor for the benthic/fish and shellfish ecology ZOI;
- a 4km buffer around the PEIR Assessment Boundary for the offshore ornithology based on an area which is considered to represent a realistic maximum spatial extent of potential impacts on ornithological receptors to take account of birds at risk of disturbance, displacement or collision; and
- the marine mammal nature conservations study area has been defined as the marine mammal management unit areas.

The information used in the PEIR has come from a variety of sources including a review of appropriate literature, factsheets, data records, and meetings with groups such as Natural England, MMO and Cefas.

Baseline environment

The preliminary assessment for nature conservation has used a desk-based approach to data collection. There are several international, national and local designations (statutory and non-statutory) of relevance to Rampion 2 offshore, along the coastline and onshore. The Nature conservation receptors that have been considered within the assessment include the following:

- Special Areas of Conservation (SAC): Southern North Sea SAC;
- Special Protection Areas (SPA): Solent and Dorset Coast SPA, Pagham Harbour SPA and Dungeness, Romney Marsh and Rye Bay potential SPA;
- Ramsar sites: Pagham Valley Ramsar;
- Marine Conservation Zone (MCZ): Kingmere MCZ, Offshore Overfalls MCZ, Utopia MCZ, Pagham Harbour MCZ, Beachy Head West MCZ, Beachy Head East MCZ, Bembridge MCZ and Selsey Bill and the Hounds MCZ;
- Site of Special Scientific Interest (SSSI): Brighton to Newhaven Cliffs SSSI, Bognor Reef SSSI, Pagham Harbour SSSI an Adur Estuary SSSI;
- Local Wildlife Site (LWS) / Marine Sites of Nature Conservation Importance (SNCI): Shelley Rocks LWS, Waldrons Marine LWS, Worthing Lumps LWS and Kingmere Rocks LWS.

The list of receptors will be kept under review during the EIA as more detailed information is obtained during baseline surveys and other forms of data collection by other aspects and will be reflected in the final ES.

Embedded environmental measures

A range of environmental measures which relate to nature conservation are embedded as part of the Rampion 2 design in order to remove or reduce significant environmental effects as far as reasonably possible. Examples of these measures include the following:

- **A Scour Protection Management Plan will be developed. It will include details of the need, type, quantity, and installation methods for scour protection.**
- **The inter-array and export cables will typically be buried below the seabed surface. The subsea export cable ducts will be drilled underneath the beach using horizontal directional drilling. The offshore export cable corridor and cable landfall will avoid all statutory marine designated areas.**
- **A Marine Vessel Management Plan (VMP) will be developed pre-construction.**
- **A piling Marine Mammals Mitigation Protocol will be implemented during construction and will include details of soft starts to be used during piling operations.**
- **Mitigation and control of invasive species measures will be incorporated into a Project Environmental Management Plan.**
- **A Marine Pollution Contingency Plan will be developed and will outline procedures to protect personnel working and to safeguard the marine environment.**
- **A Decommissioning Marine Mammal Mitigation Protocol will be implemented during decommissioning in line with the latest relevant available guidance.**

Likely significant effects

Overview

Based on the proposed location of the offshore infrastructure and the subsequent operation, plus the incorporation of appropriate embedded environmental measures, **No Significant Effects** have been identified at this stage in relation to potential impacts on Rampion 2 on the majority of nature conservation receptors from construction, operation and maintenance and decommissioning activities.

However, in the absence of further mitigation **Potential Significant Effects** have been identified in all project phases for black bream in relation to impacts to mobile features of designated sites, specifically Kingmere MCZ. Further mitigation options are being considered to make it possible to reduce the level of effect to a not significant level for the ES.

Cumulative effects

No Significant Cumulative Effects have been identified at this stage in relation to Rampion 2 on nature conservation from construction, operation and maintenance, and decommissioning activities. Further work is to be undertaken for some of the technical chapters and an updated cumulative effects assessment will be reported in the ES.

Inter-related effects

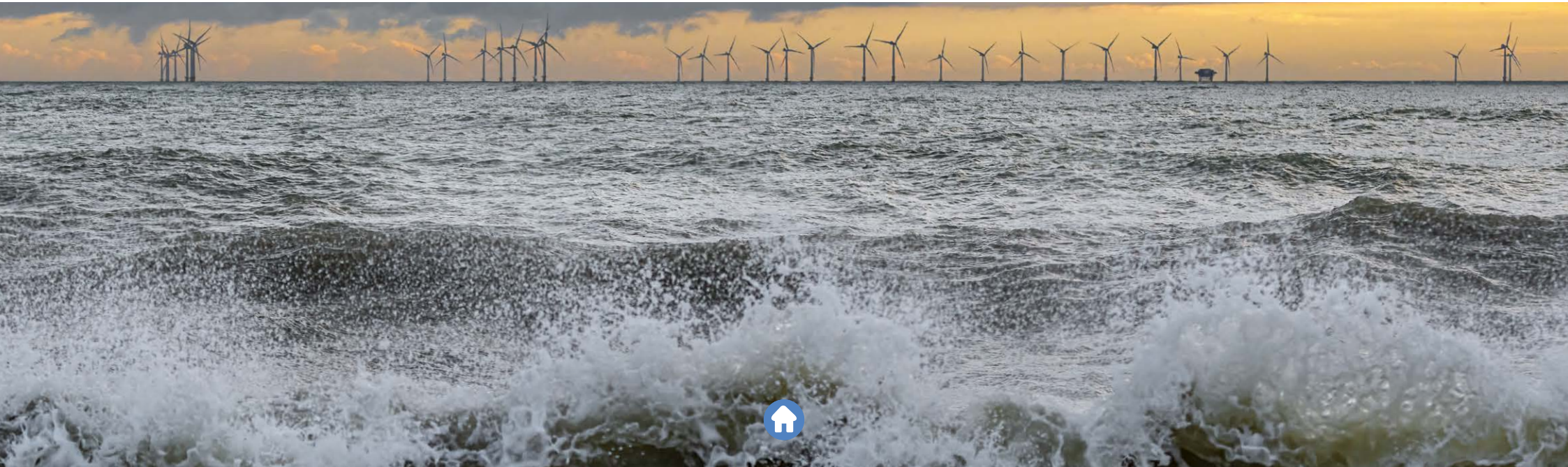
No Significant Inter-related Effects of greater significance compared to the impacts considered alone were identified at this stage for nature conservation from the construction, operation and maintenance, and decommissioning of Rampion 2.

Transboundary effects

No Significant Transboundary Effects have been identified as the nature conservation assessment only considers designated sites within the UK.

Next steps

Assessments within the various aspect chapters used to inform the preliminary assessment on nature conservation detail additional work that will be undertaken and incorporated into the final ES. Any updates to these assessments will be reviewed against the nature conservation preliminary assessment and incorporated, as necessary.



5.11 Civil and military aviation

This section summarises the assessment findings at this point in the EIA process for civil and military aviation, based on **Chapter 15: Civil and military aviation, Volume 2.**

How effects on civil and military aviation have been assessed

The preliminary assessment has considered the likely significant effects on aviation activities with respect to impacts on radar and UK airspace predicted due to the physical presence of the offshore windfarm during the construction, operation and maintenance, and decommissioning phases with respect to civil and military aviation. The assessment also takes into consideration the CAA, Ministry of Defence (MoD), regional airports, local aerodromes, National Air Traffic Services (NATS), and other UK aviation stakeholders. Potential impacts include: physical obstruction to aircraft, increased air traffic in the area related to wind farm activities, operation of aerodromes, interference to civilian and military radars the risk of a collision.

Information to inform the civil and military aviation preliminary assessment has come from a desk study, which determined those aviation bodies that were likely to be affected by Rampion 2, including all radar systems within operational range. Comments made by PINS, the MoD and NATS in response to the Scoping Report have also been considered.

Baseline environment

Military and aviation receptors that have been considered in the assessment include civil aerodromes (Farnborough Airport, Gatwick Airport, Shoreham Airport and Southampton Airport), MoD facilities, NATS facilities, and other aviation facilities such as offshore fixed-wing and helicopter operations, military low flying and search and rescue operations.

Embedded environmental measures

A range of environmental measures which relate to civil and military aviation are embedded as part of the Rampion 2 design to remove or reduce significant environmental effects as far as possible. Examples of these measures include the following.

- **An Emergency Response and Corporation Plan (ERCOP) will be developed.**
- **Aviation stakeholders will be notified of the location and height of all WTG, offshore substations and associated construction activities (all structures over 150ft).**
- **The Proposed Development will comply with legal requirements with regards to shipping, navigation and aviation marking and lighting.**

Likely significant effects

Overview

Based on the proposed location of the offshore infrastructure and its subsequent operation, plus the incorporation of appropriate embedded environmental measures, **No Significant Effects** have been identified at this stage in relation to potential impact of Rampion 2 on civil and military aviation from construction, operation and maintenance, and decommissioning.

Cumulative effects

No Significant Cumulative Effects have been identified at this stage in relation to Rampion 2 on civil and military aviation from construction, operation and maintenance, and decommissioning activities. Further work is to be undertaken and an updated cumulative effects assessment will be reported in the ES.

Inter-related effects

No Significant Inter-related Effects of greater significance compared to the impacts considered alone were identified at this stage for civil and military aviation receptors from the construction, operation and maintenance and decommissioning of Rampion 2.

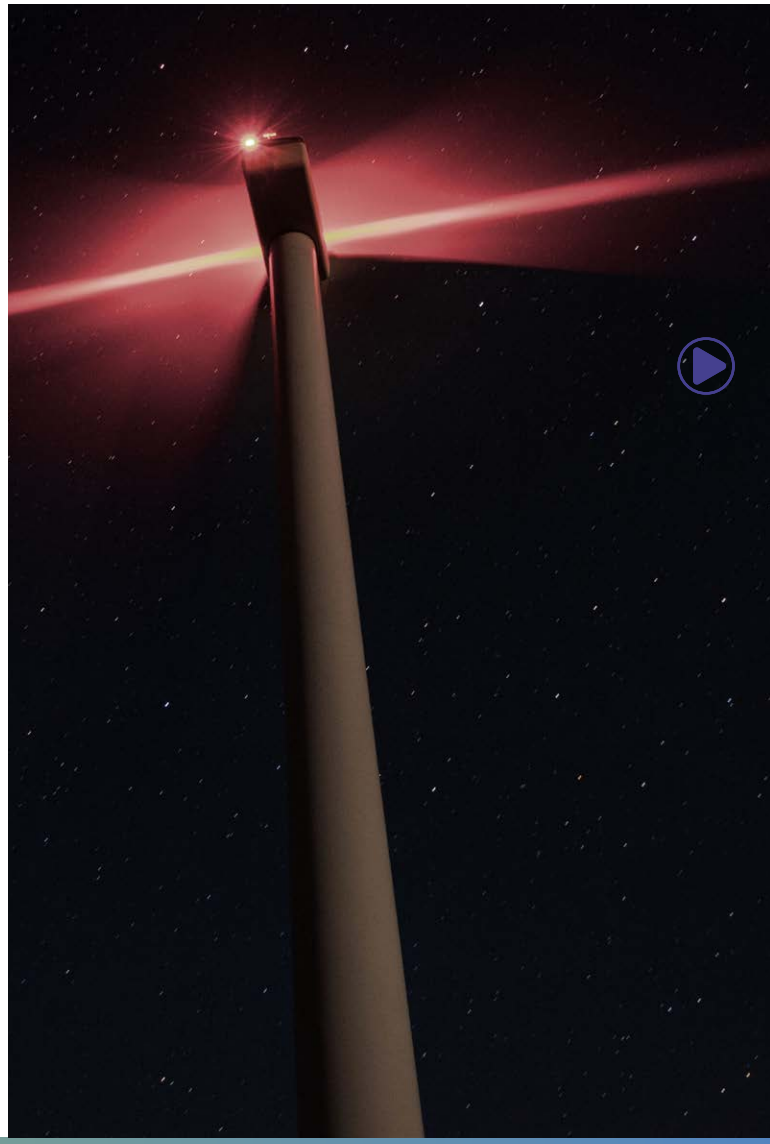
However, aviation lighting fitted to offshore WTGs could cause confusion to the maritime community due to conflicting warning lighting representing a collision risk to maritime surface vessels. Work has been undertaken to develop an aviation warning lighting standard where it will be apparent to mariners that the aviation lighting is clearly distinguishable from maritime lighting.

Transboundary effects

No Significant Transboundary Effects have been identified at this stage in relation to Rampion 2 on civil and military aviation from construction, operation and maintenance, and decommissioning activities.

Next steps

The preliminary assessment will be refined and where appropriate updated to reflect the final Rampion 2 design to be taken forward and presented in the ES; along with further consultation and engagement be undertaken with the NATS, the MoD and Shoreham Airport.



5.12 Seascape, landscape and visual

This section summarises the assessment findings at this point in the EIA process for seascape, landscape and visual, based on **Chapter 16: Seascape, landscape and visual, Volume 2.**

How effects on seascape, landscape and visual has been assessed

The preliminary assessment for seascape, landscape and visual has considered impacts from construction and decommissioning phase activities. During the operation and maintenance phase, daytime impacts have been assessed on seascape, landscape and visual receptors. Night-time effects of the operation and maintenance of Rampion 2 lighting have been assessed on visual receptors and the dark night skies quality of the South Downs National Park (SDNP).

The study area for the seascape, landscape and visual assessment is defined as 50km from Rampion 2 PEIR Assessment Boundary (for the purposes of the SLVIA assessment, this comprising the maximum extent of the proposed array area within which the WTGs will be installed). It is broadly defined by a northern terrestrial area, including the counties of East Sussex, West Sussex, Isle of Wight, Hampshire, Surrey and Kent; as well as the City of Brighton and Hove; and a southern offshore area defined by waters of the English Channel.

The information used in the PEIR has come from a variety of sources including a review of appropriate literature, obtaining relevant data records from councils, statutory bodies, records from Rampion 1, site-specific field-survey work and meetings with groups including Historic England, National Trust, Natural England, East Sussex County Council, West Sussex County Council, Adur and Worthing District Councils, Arun District Council, Brighton and Hove City Council, Horsham District Council, Mid-Sussex District Council, Chichester Harbour AONB, High Weald AONB Partnership, Isle of Wight AONB Partnership and the SDNPA.

Baseline environment

The preliminary assessment for seascape, landscape and visual has been informed by desk-based studies and field survey work undertaken within the study area. The landscape, seascape and visual baseline has been informed by a desk-based review of landscape and seascape character assessments, and the Zone of Theoretical Visibility (ZTV). This has been used to identify receptors that may be affected by the

offshore elements of Rampion 2 and produce written descriptions of their key characteristics and value.

Field-survey work for viewpoint photography, visual assessment and landscape assessment surveys were undertaken during August, September and November 2020.

Seascape, landscape and visual receptors that have been considered within the assessment include the following:

- seascape character;
- landscape character and designations/ defined areas;
- South Downs National Park Special Qualities;
- visual receptors which includes settlements, key visitor locations and destinations, transport and recreational routes and viewpoints.

Views to the sea and the offshore elements of Rampion 2 from the West Sussex coastal plain (the area of West Sussex between the urban coastline and boundary of the South Downs National Park) are limited by existing vegetation, woodland and buildings within urban areas. This coastal plain is separated from the sea by large urban areas. The main areas where Rampion 2 may be theoretically visible are coastal areas between Selsey Bill and Beachy Head. The higher ground of the South Downs largely screens the area to the north from the sea.

The list of receptors will be kept under review during the EIA as more detailed information is obtained during baseline surveys and other forms of data collection by other aspects and will be reflected in the final ES.

Embedded environmental measures

A range of environmental measures which relate to benthic, subtidal and intertidal ecology are embedded as part of the Rampion 2 design in order to remove or reduce significant environmental effects as far as reasonably possible. Examples of these measures include the following:

- **Maximum blade tip height is 325m from LAT and maximum rotor diameter is 295m.**
- **Due regard will be given to design principles held in Rampion 1 Design Plan and design principles to be developed for Rampion 2, with consideration of the seascape, landscape and visual impacts on the South Downs National Park and Sussex Heritage Coast.**
- **Marking and lighting the Proposed Development offshore will be undertaken in accordance with relevant industry guidance and as advised by relevant stakeholders.**

Likely significant effects

Overview

Based on the proposed location of the offshore infrastructure and its subsequent operation, plus the incorporation of appropriate embedded environmental measures, **No Significant Effects** have been identified at this stage in relation to potential impact of Rampion 2 on seascape landscape and visual receptors from construction, operation and decommissioning activities within the geographic areas of Hampshire and the Solent, and the Isle of Wight. **No Significant Effects** on the landscape character or views from the High Weald and Low Weald have been identified.

Significant seascape, landscape and visual effects of the offshore elements of Rampion 2 are contained within the areas of the SDNP, Sussex Heritage Coast, West Sussex, East Sussex and the City of Brighton.

Cumulative effects

No Significant Cumulative Effects have been identified at this stage in relation to Rampion 2 on seascape, landscape and visual from construction, operation and maintenance, and decommissioning activities. Further work is to be undertaken and an updated cumulative effects assessment will be reported in the ES.

Inter-related effects

No Significant Inter-related Seascape, Landscape or Visual Effects of greater significance compared to the impacts considered alone were identified at this stage for seascape, landscape and visual receptors from the construction, operation and maintenance, and decommissioning of Rampion 2.

Transboundary effects

No Significant Transboundary Effects have been identified at this stage in relation to Rampion 2 on seascape, landscape and visual from construction, operation and maintenance, and decommissioning activities.

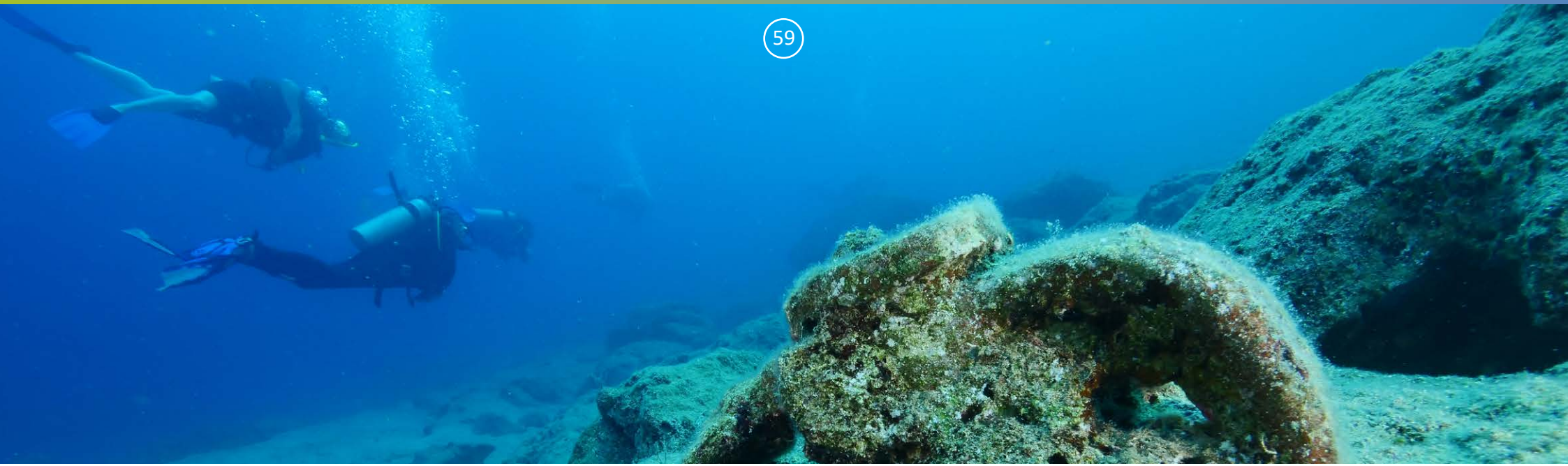
Next steps

The preliminary assessment will be refined and where appropriate, updated to reflect the final Rampion 2 design which will be taken forward and presented in the ES. Further field survey verification of impact assessments will be undertaken for the ES from a number of key viewpoints at the threshold of significance using photomontages produced for the PEIR. Similarly, further field survey verification of impact assessments will be undertaken for the ES for certain key sections of the South Downs Way using the PEIR photomontages.

Additional visual impact assessments will be undertaken from a number of further viewpoints that are not assessed in this PEIR, as agreed with the ETG for inclusion in the ES.

Further consultation and engagement will be ongoing with the relevant stakeholders, including the SDNPA. External comments received on the PEIR assessments will be addressed in the preparation of the ES.

Example photomontage of what Rampion 2 could look like from Beachy Head. See main PEIR document for the full set of assessed viewpoints and interpretation (Figures 16.26 to 16.65, Volume 3)



5.13 Marine archaeology

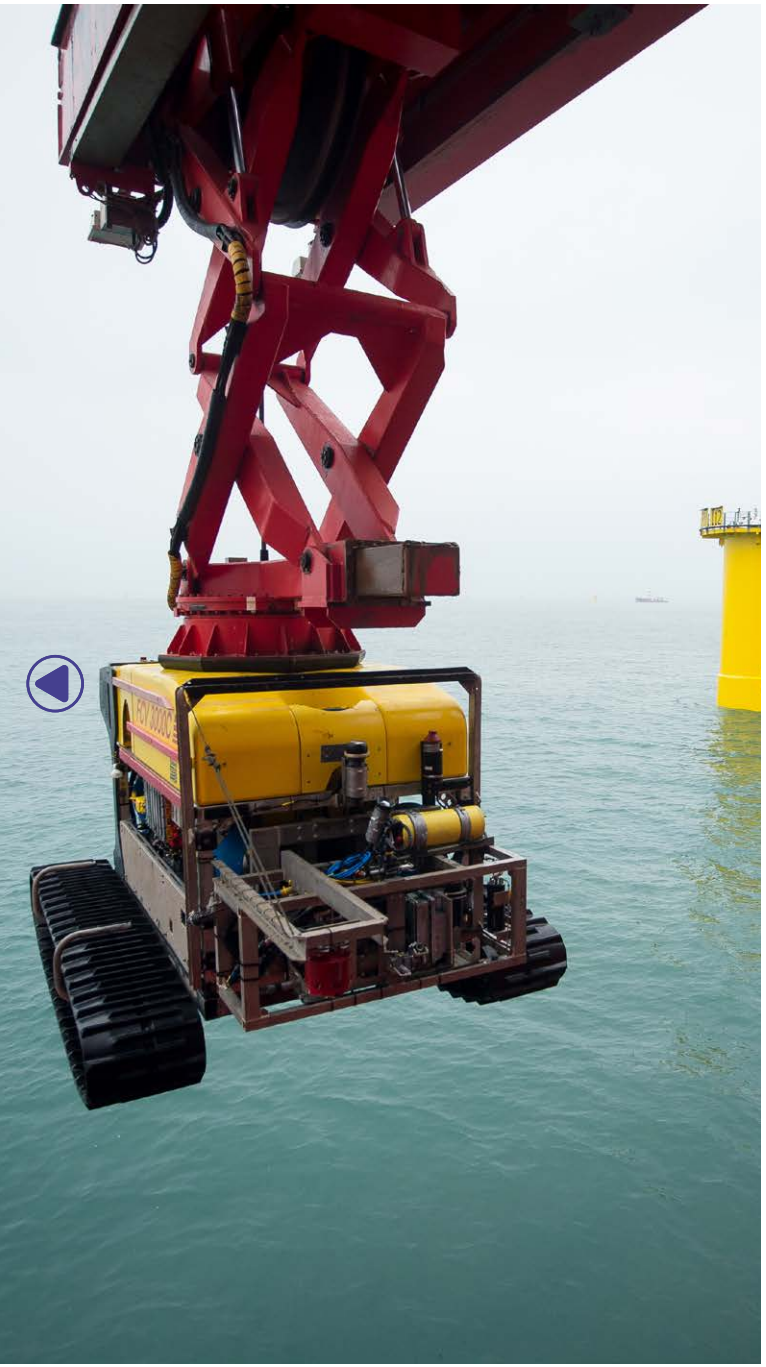
This section summarises the assessment findings at this point in the EIA process for marine archaeology, based on **Chapter 17: Marine archaeology, Volume 2**.

How effects on marine archaeology have been assessed

The preliminary assessment has considered the likely significant effects on marine heritage from the construction, operation and decommissioning of Rampion 2. This includes physical resources such as shipwrecks, aviation remains, archaeological sites, archaeological finds and material including pre-historic deposits as well as archival documents and oral accounts recognised as of historical/archaeological or cultural significance. Potential direct effects on marine heritage include those such as the loss or disturbance of marine archaeology and indirect effects include those such as changes to the character of the sea surface and the perception of the historic seascape.

Information on the existing marine heritage has been gathered primarily from geophysical surveys which detect any natural or manmade submerged structure on the seabed and therefore assist in characterising the marine archaeology present. A desk study was also undertaken, which involved a literature review and the collation of data from a range of sources including: Historic England's National Record of the Historic Environment (NRHE), West Sussex and East Sussex's Historic Environment Records (HER), UK Hydrographic Office (UKHO), and a number of Antiquities and archaeological discoveries' databases.

In addition, in order to understand the existing marine heritage environment and associated potential issues, engagement has taken place with the Historic England, East Sussex County Council, West Sussex County Council, South Downs National Park Authority and the Marine Management Organisation.



Baseline environment

The marine archaeological resource can be characterised within the following four main categories of sites and features.

- Landscape: submerged prehistoric landscapes related to fluctuations in past sea-level. Such landscapes may contain significant evidence of prehistoric human occupation and/or environmental change.
- Vessel: Archaeological remains of vessels deposited after a wrecking event at sea or abandoned in an intertidal context.
- Aircraft: Remains of aircraft crash sites, typically the result of Second World War military conflict, but also numerous passenger casualties. This category includes aircraft and airships dating to the First World War.
- Structures: Structural remains including defensive structures, lighthouses, jetties, harbours, fish traps or sites lost to the sea as a result of coastal erosion may be found within the intertidal zone (between Mean Low Water Springs (MLWS) and Mean High Water Springs (MHWS).

Within the marine archaeology study area there are a total of 49 known wrecks and 21 reported losses of aircraft, all but one, which is unidentified, date to the Second World War, as well as a number of targets identified during seabed surveys which may have further archaeological interest.

Embedded environmental measures

A range of environmental measures which relate to marine archaeology are embedded as part of the Rampion 2 design to remove or reduce significant environmental effects as far as possible. Examples of these measures include the following:

- **A Marine Written Scheme of Archaeological Investigation (WSI) will outline the Archaeological Exclusion Zones (AEZ), the implementation of a Protocol for Archaeological Discoveries in accordance with 'Protocol for Archaeological Discoveries: Offshore Renewables Projects' and future monitoring and assessment requirements.**
- **Offshore geophysical surveys (including UXO surveys) undertaken during the life of the project will be subject to full archaeological review where relevant in consultation with Historic England.**
- **Offshore geotechnical surveys prior to construction will be undertaken following early discussions with Historic England.**

Likely significant effects

Overview

The impacts of the Rampion 2 construction phase have been considered on marine heritage receptors and it has been agreed with stakeholders that, with the implementation of identified embedded environmental measures, all impacts from the construction phase can be scoped out from further assessments and **No Significant Effects** have been identified. In addition, based on the proposed location of the offshore infrastructure and its subsequent operation, plus the incorporation of appropriate embedded environmental measures, **No Significant Effects** have been identified at this stage in relation to potential impact of Rampion 2 on marine archaeology from operation and maintenance, and decommissioning activities.

Cumulative effects

No Significant Cumulative Effects have been identified at this stage in relation to Rampion 2 on marine archaeology from construction, operation and maintenance, and decommissioning activities. Further work is to be undertaken and an updated cumulative effects assessment will be reported in the ES.

Inter-related effects

No Significant Inter-related Effects of greater significance compared to the impacts considered alone were identified at this stage for marine archaeology receptors from the construction, operation and maintenance and decommissioning of Rampion 2.

Transboundary effects

No Significant Transboundary Effects have been identified at this stage in relation to Rampion 2 on marine archaeology from construction, operation and maintenance and decommissioning activities.

Next steps

The preliminary assessment will be refined and where appropriate updated to reflect the final Rampion 2 design to be taken forward and presented in the Environmental Statement. Any updates to the understanding of the marine archaeology baseline; along with further consultation and engagement with the Marine Management Organisation, Historic England, East Sussex County Council, West Sussex County Council and South Downs National Park Authority will be incorporated.

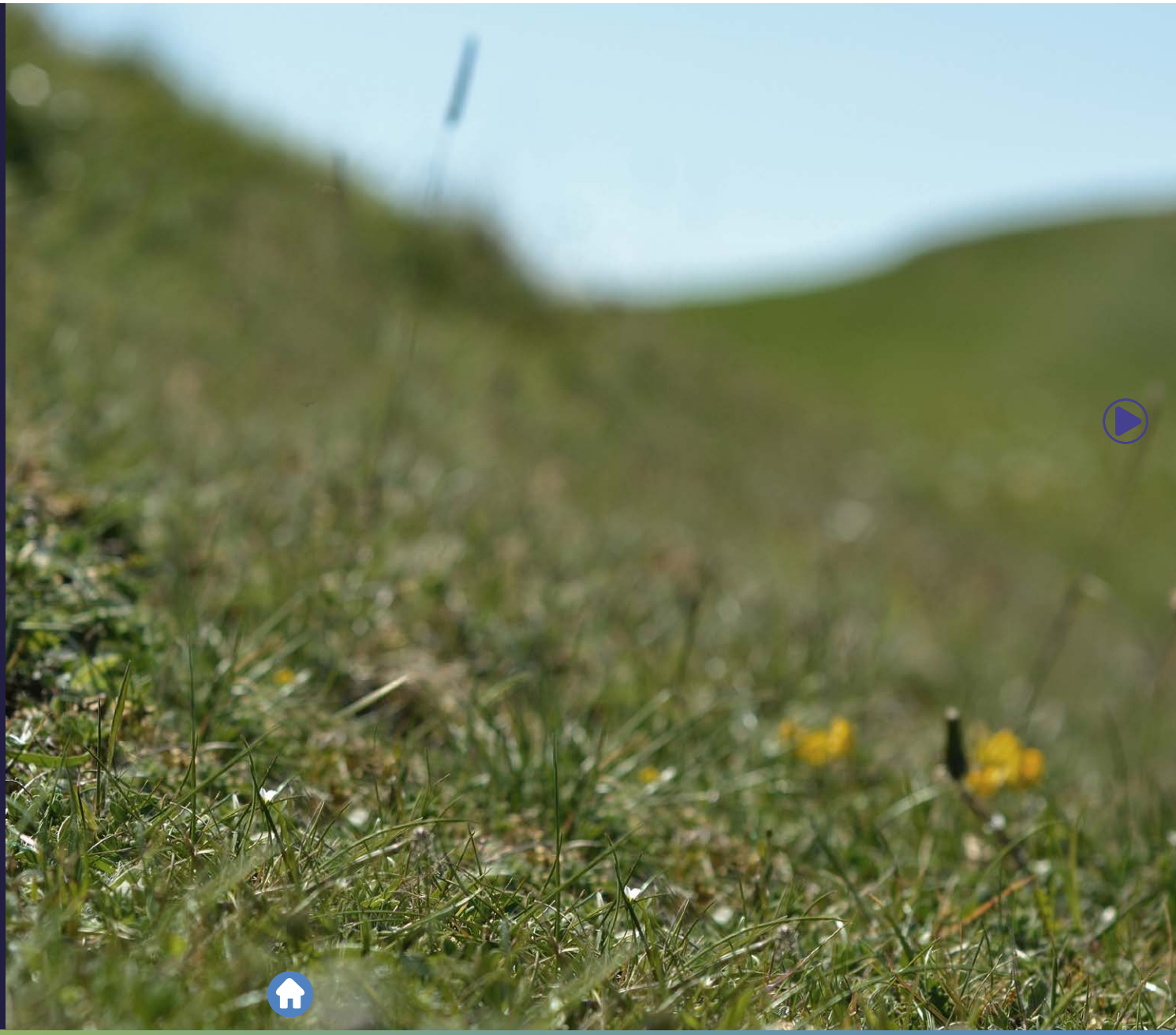
6. Preliminary environmental assessment onshore

6.1 Introduction

This section provides a summary of the preliminary assessment of likely significant effects to onshore resources and receptors including:

- Socio-economics;
- landscape and visual impact;
- air quality;
- soils and agriculture;
- noise and vibration (onshore);
- terrestrial ecology and nature conservation;
- transport;
- ground conditions;
- historic environment;
- water environment; and
- major accidents and disasters.

The onshore part of the PEIR Assessment Boundary is shown in Figure 1–2.



6.2 Socio-economics

This section summarises the assessment findings at this point in the EIA process for socio-economics, based on **Chapter 18: Socio-economics, Volume 2.**

How socio-economic effects have been assessed

The preliminary assessment considers the likely significant effects at a national, regional (Sussex and local level on jobs, economic output, the visitor economy, in addition to both onshore and offshore recreation during the construction, operation and decommissioning phases of Rampion 2.

Information on the existing socio-economic baseline situation has been gathered from a site walkover and from data requested from a number of sources. This has included government and local authority records such as the Office of National Statistics (ONS), and consultation with West Sussex County Council (WSCC, South Downs National Park Authority (SDNPA, National Trail Officer for the South Downs Way, Brighton and Hove City Council, Visit Brighton, Natural England, Sustrans, BEKS Kitesurfing School, Aspire River Arun Swim, West Sussex Local Access Forum and the South Downs Local Access Forum.

Baseline environment

Sussex has a total population of around 1.71 million people, of whom 1.03 million (or 60%) are of core working age (ie. aged 16-64). Data from the ONS indicates that Sussex contributed just over £40.1 billion gross value added (GVA) to the UK economy in 2018. Important sectors include wholesale & retail, health & social work, and education. In relation to GVA per head of population, data shows a significant gap between Sussex and the UK, with GVA per head in Sussex approximately £23,600 compared with £28,700 per head nationally. The employment rate in Sussex is approximately 79% when compared with the national average of 76%; while the average unemployment rate is 3.9% slightly higher than the average for the UK as a whole (3.7%).

Recreational activities and attractions in the area include bathing, scuba diving, recreational angling, sailing, canoeing and kayaking, wind surfing and kite surfing, Climping Beach, Rivers Arun and Adur, plus numerous cycle routes, public rights of way and promoted routes (England Coast Path, Monarch's Way, the Downs Link and the South Downs Way National Trail).

Sussex is also home to several attractions attracting over 100,000 visits per year, the most popular of these is Brighton Pier which consistently brings in between 4 and 5 million visitors per year.

Embedded environmental measures

A range of environmental measures which relate to socio-economic impacts are embedded as part of the Rampion 2 design to remove or reduce significant environmental effects as far as possible. Examples of these measures include the following:

- **RED will work with local partners and seek to maximise the ability of local people to access employment opportunities associated with the construction and operation of Rampion 2.**
- **An outline Code of Construction Practice (COCP) will be adopted to minimise temporary disturbance to residential properties, recreational users and existing land users. It will provide details of measures to protect environmental receptors.**
- **A comprehensive awareness and communications strategy, (a Diver Communication Plan) will be developed, in agreement with regulatory authorities, to notify the diving/ spearfishing community of the timing and duration of proposed works.**
- **Preparation and implementation of a Public Rights of Way Management Plan that includes measures to manage and mitigate effects on the Public Rights of Way network.**

Likely significant effects

Overview

Rampion 2 is predicted to have a number of likely **Significant Effects** on a number of onshore and offshore recreational activities (event attendees, users of some Public Rights of Way, wind/kite surfers, recreational angling and village green users) during the construction phase and on the users of two Public Rights of Way (Footpaths referenced 36Bo and 1T) and scuba diving activities during the operation and decommissioning phases. No direct **Significant Impacts** were identified at this stage for volume and value of the Sussex tourism economy.

Cumulative effects

There is the potential for **Significant Cumulative Effects** on the users of certain Public Rights of Way identified previously, during the construction, operation and maintenance, and decommissioning phases. These are preliminary conclusions at this stage, taking into account all proposed embedded environmental measures. Additional work will be undertaken, to further minimise effects wherever possible, as the Rampion 2 design and environmental assessment processes take place.

There is the potential for beneficial cumulative effects on employment, economic activity and the ability for local residents to access employment opportunities in both the construction and operation and maintenance phase.

Inter-related effects

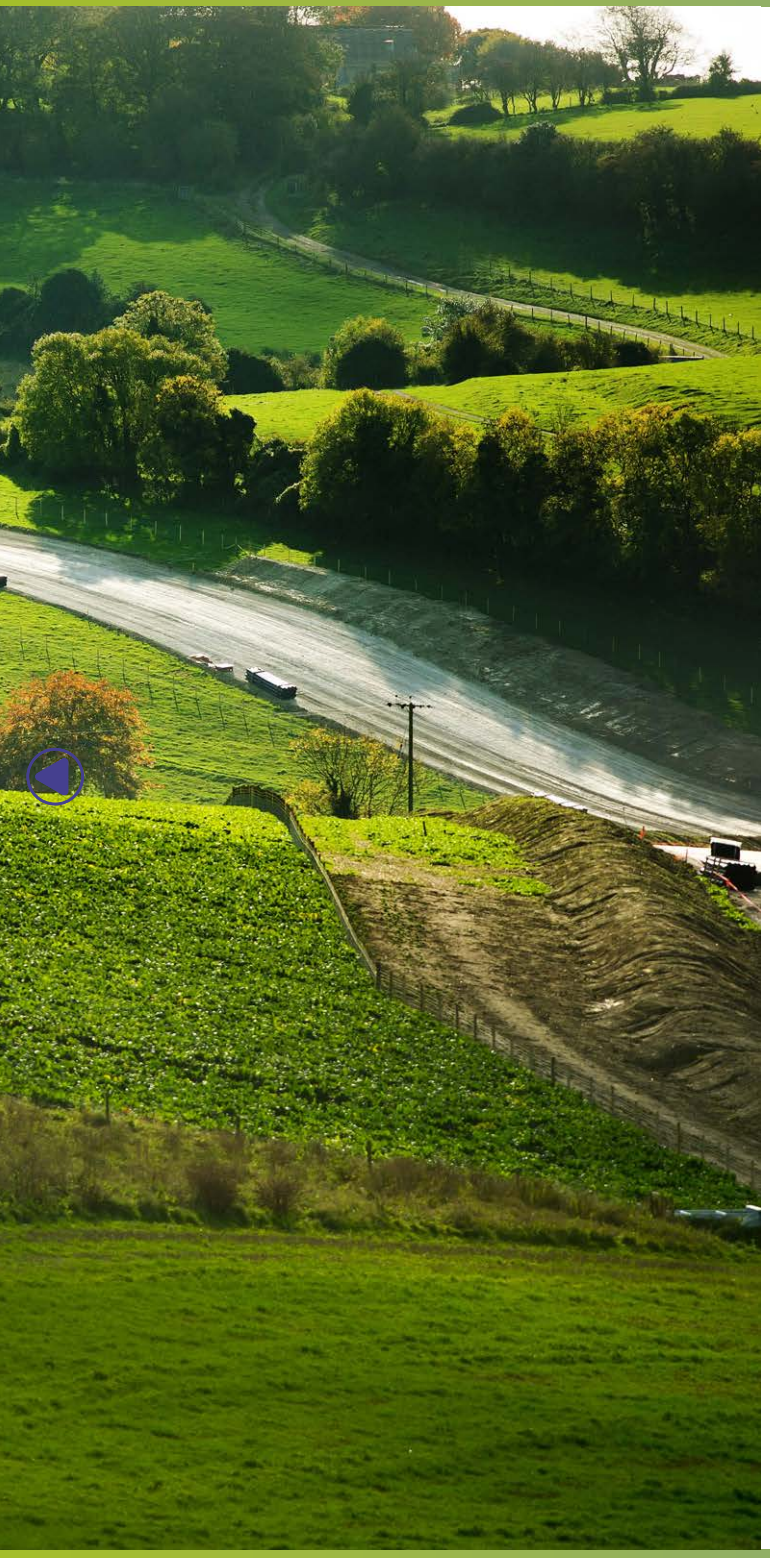
No Significant Inter-related Effects of greater significance compared to the impacts considered alone were identified at this stage for socio-economic receptors from the construction, operation and maintenance, and decommissioning of Rampion 2.

Transboundary effects

No Significant Transboundary Effects have been identified at this stage in relation to Rampion 2 on socio-economic receptors from construction, operation and maintenance, and decommissioning activities.

Next steps

The assessment of the socio-economic effects will continue to evolve as further information is available, any scheme refinements are taken into account, and in response to further engagement with consultees. Updates to the assessment will be incorporated in the ES.



6.3 Landscape and visual impact

This section summarises the assessment findings at this point in the EIA process for landscape and visual impact, based on **Chapter 19: Landscape and Visual Impact, Volume 2.**

How effects on landscape and visual receptors have been assessed

The preliminary assessment has considered the likely significant effects of Rampion 2 on landscape and visual receptors. The assessment methodology used is based on the current guidance produced by the Landscape Institute and the Institute of Environmental Management & Assessment (IEMA.

- Landscape effects deal with the effects of change and development on landscape as a resource. The concern here is with how the proposal will affect the elements that make up the landscape, the aesthetic and perceptual aspects of the landscape and its distinctive character.
- Visual effects deal with the effects on specific views and on the general visual amenity experienced by people. Visual amenity considers the overall views and surroundings, which provide a visual setting or backdrop to the activities of people living, working, recreating, visiting or travelling through an area.

Effects in relation to landscape have been considered through analysis of local landscape character areas/types. Visual effects have been considered through analysis of the Zone of Theoretical Visibility (ZTV) relating to Rampion 2. The ZTV is the theoretical area, based on computer modelling, in which part or all of Rampion 2 will be visible. Visual effects are also considered using viewpoints, which are specific locations which have been agreed with stakeholders.

The information used in the preliminary assessment has been gathered from a combination of desk-based study, including published landscape character assessments, and a field survey programme. The survey programme is currently ongoing and has so far gathered information regarding existing landscape character and views (aided by photography) within the study area. Consultation in relation to the study area and viewpoint selection has been undertaken with the South Downs National Park Authority (SDNPA), Natural England (NE), National Trust, West Sussex County Council (WSCC), Horsham District Council, Arun District Council, Mid-Sussex District Council and High Weald AONB Partnership.

Baseline environment

The landscape along the onshore cable corridor and the substation search areas can broadly be divided into three areas. Between the landfall and the edge of the SDNP is a coastal plain which rises gently towards the National Park. The relatively flat, lower coastal plain is heavily urbanised with regional road and rail corridors. In between development and transport links is a farmed landscape of large open fields with few trees and hedgerows. Further north towards the SDNP, the landscape is varied, incorporating open arable farmland, smaller settlements, and more wooded areas.

The onshore cable corridor crosses a part of the SDNP which has a broad elevated east–west ridge, and a series of hills east and west beyond the study area. The area to the east of the River Arun has an open, exposed 'South Downs' landscape, however, the area to the west of the River Arun features large woodlands. Roads and villages are mainly concentrated in the river valleys.

Public rights of way including the South Downs Way National Trail cross this landscape with some panoramic views across the downs and beyond.

Between the SDNP and the northeast of the study area, the landscape drops sharply into the broad, low-lying vales of the Low Weald, before rising again towards the High Weald AONB beyond. This landscape is predominantly agricultural and largely pastoral with either grassland or meadows. A number of smaller towns and villages are scattered among areas of woodland, while larger villages have grown around major transport routes. Numerous woodland blocks are scattered throughout this landscape along with many small rivers, streams and water features such as ponds and brooks.

Visual receptors are people who may have a view of Rampion 2, including residents and people using transport routes and Public Rights of Way. Existing views include those of the semi-rural and urban components of the landscape within the study area, summarised above.

Views tend to be open in the south of the study area, with panoramic views out to sea from areas of the coastal plain. Where vegetation does not restrict views, there are also longer distance views of the surrounding landscape from more elevated parts of the SDNP and High Weald AONB (which is beyond the study area). Moving further inland to the northeast of the study area, variations in topography and a greater concentration of woodlands and hedgerows mean that views tend to be less open.

Embedded environmental measures

A range of environmental measures which relate to landscape and visual impacts are embedded as part of the Rampion 2 design to remove or reduce significant environmental effects as far as possible. Further environmental measures will be incorporated into the final design, which may include screening or planting at specific locations. Examples of these measures include the following:

- **The entire onshore cable corridor will be completely buried underground for its entire length where practicable.**
- **Landscape elements such as trees, woodland and hedgerows that are removed during the construction process will be reinstated as far as possible.**
- **The onshore cable route will avoid the brows of hills as far as is reasonably practical and is likely to follow the established pattern of the landscape.**
- **Minimising diversions and closures on public rights of way including the South Downs Way and Downs Link.**
- **Where construction lighting is required, this will be limited to directional task lighting to minimise impacts to residents and walkers within the South Downs National Park.**

Likely significant effects

Overview

The preliminary assessment concludes that **Significant Effects** are likely to occur to landscape and visual amenity receptors at some assessed locations as a result of construction, operation and maintenance, and / or decommissioning of Rampion 2. Construction and decommissioning effects will typically be short term and temporary. Further design refinements will aim to minimise significant effects across all phases through additional environmental measures such as screening and planting.

Cumulative effects

The preliminary cumulative effects assessment concludes that **Significant Effects** will occur to landscape and visual amenity receptors due to the combined impacts of Rampion 2 with other developments in the area.

Along with further design refinements, baseline data and further information on other developments will continue to be collected and an updated cumulative effects assessment will be reported in the ES.

Inter-related effects

No Significant Inter-related Effects of greater significance compared to the impacts considered alone were identified at this stage for landscape and visual receptors from the construction, operation and maintenance, and decommissioning of Rampion 2.

Transboundary effects

No Significant Transboundary Effects have been identified at this stage in relation to Rampion 2 on landscape and visual receptors from construction, operation and maintenance, and decommissioning activities.

Next steps

The preliminary assessment presented in this PEIR will be refined and where appropriate updated to reflect the final onshore substation location and onshore cable corridor to be taken forward and any updates to the desk study; along with the results of further consultation and engagement be with Natural England, local authorities and other interested parties. The updates will be incorporated into the ES.

Engagement with appropriate stakeholders will continue and will inform the baseline, further development of embedded environmental measures and assessment of effects, as appropriate. Visualisations of Rampion 2 will be prepared by the design team to inform the assessment. The design and assessment processes will continue to enable further development and assessment of Rampion 2 in respect of landscape and visual amenity, to minimise negative effects.

6.4 Air quality

This section summarises the assessment findings at this point in the EIA process for air quality effects, based on **Chapter 20: Air quality, Volume 2.**

How effects on air quality have been assessed

Likely significant effects on air quality may be caused due to emissions of dust and odour, and any significant increases of pollutants in the air.

The main pollutants of concern in the UK in relation to health effects are nitrogen dioxide (NO2) and particles (Particulate Matter - PM). The particles in the air which were considered in the assessment were PM10 (particulate matter up to 10 micrometres in diameter) and PM2.5 (particulate matter up to 2.5 micrometres in diameter). Nitrogen oxides (NOx) has also been considered in relation to ecological receptors.

Increased emissions that could arise because of changes in activity due to Rampion 2 have been assessed. These changes include activities that could generate dust and odour during construction, additional road vehicle movements during construction, and changes in road vehicle movements as Rampion 2 becomes operational.

The assessment has considered the potential effects of construction dust on people within 350m of work sites, and within 50m of the route(s) used by vehicles on the public highway, up to 500m from the temporary construction site. For sensitive ecological sites the distance considered is 200m of the boundary of the temporary construction site or of the route(s) used by construction vehicles on the public highway, up to 500m from the temporary construction site entrance.

For emissions of air pollutants from construction and operational traffic and construction equipment on site the assessment has considered ecological receptors, residential properties and other locations where people may be exposed within 200m of affected roads and temporary construction sites and especially in Air Quality Management Areas (AQMAs).

Information on existing air quality is based on data requests from a number of sources, including government and local authority records, and consultation with Natural England, Arun District Council (ADC), Horsham District Council (HDC) and Mid Sussex District Council (MSDC), as these are the local authorities with responsibility for onshore air quality.

Baseline environment

Local planning authorities are required to assess air quality within their administrative area. They are required to declare an Air Quality Management Area (AQMA) where pollution levels may exceed Air Quality Objectives (AQOs) established for the protection of health.

The onshore landfall, cable corridor and substation areas lie within the administrative areas of three District Councils: Arun, Horsham and Mid Sussex. Each district council produces an Annual Status Report which describes air quality in its administrative area.

Two AQMAs have been declared within 5km of Rampion 2, both for NO2: Storrington AQMA and, Cowfold AQMA. In addition, road traffic will pass through the administrative areas of other local authorities. In particular, traffic during the construction phase will pass through Worthing Borough Council AQMA No. 2. In each AQMA there are currently localised exceedances of the AQO, however where this occurs it is generally close to busy roads and not everywhere in each AQMA.

Air quality is generally expected to improve with time, and pollutant concentrations are predicted to be lower in future than at present. This is because of factors such as newer road vehicles meeting tighter emission standards and an increase in electric vehicles on the road.

Embedded environmental measures

range of environmental measures which relate to air quality are embedded as part of the Rampion 2 design to remove or reduce significant environmental effects as far as possible. Examples of these measures include the following:

- **Avoiding sensitive sites by the project footprint where practical.**
- **Implementation of best practice air quality management measures which will be included within the Code of Construction Practice (COCP) and will be requirements of the DCO.**

Likely significant effects

Overview

Based on the proposed location of the onshore substation and routing of the onshore temporary cable corridor, plus the incorporation of appropriate embedded environmental measures such as the COCP, **No Significant Effects** have been identified at this stage in relation to potential impact of Rampion 2 on air quality from construction, operation and maintenance, and decommissioning.

Cumulative effects

No Significant Cumulative Effects have been identified at this stage in relation to Rampion 2 on air quality from construction, operation and maintenance, and decommissioning activities.

Inter-related effects

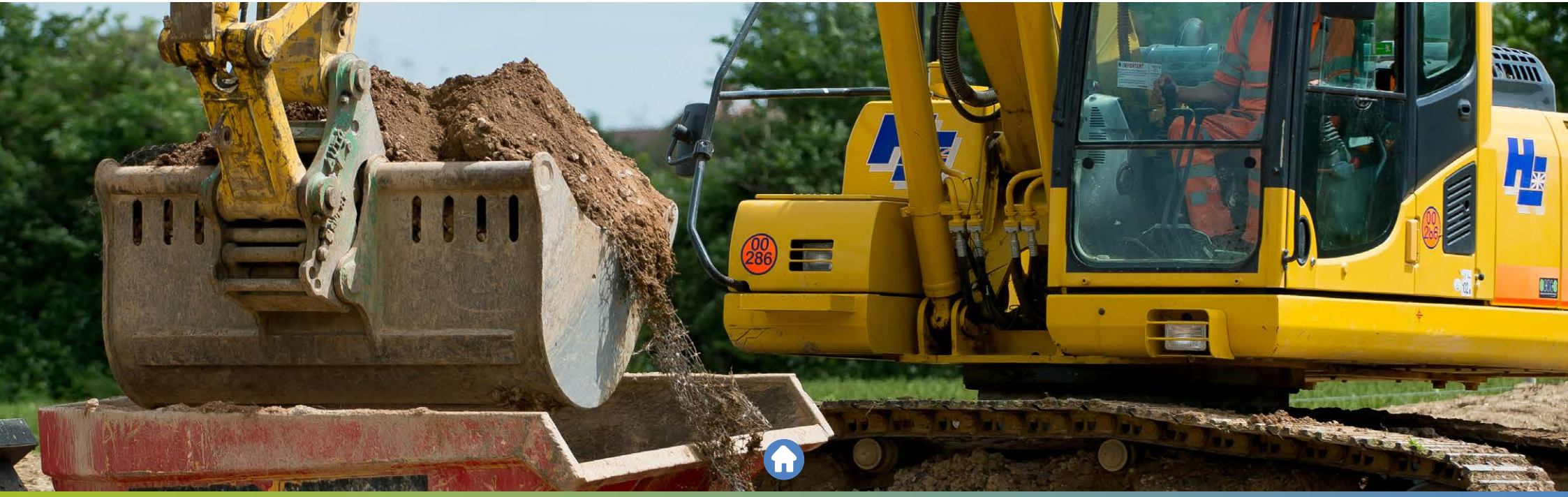
No Significant Inter-related Effects of greater significance compared to the impacts considered alone were identified at this stage for air quality receptors from the construction, operation and maintenance, and decommissioning of Rampion 2.

Transboundary effects

No Significant Transboundary Effects have been identified at this stage in relation to Rampion 2 on air quality receptors from construction, operation and maintenance, and decommissioning activities.

Next steps

The preliminary assessment will be refined and where appropriate updated to reflect the final onshore substation location and temporary onshore cable corridor to be taken forward and any updates to the desk study; along with further consultation and engagement be undertaken with relevant local authorities. Updates will be incorporated into the ES.



6.5 Soils and agriculture

This section summarises the assessment findings at this point in the EIA process for soils and agriculture, based on **Chapter 21: Soils and agriculture, Volume 2.**

How effects on soils and agriculture effects have been assessed

The preliminary assessment on soils and agriculture examines the likely significant effects that maybe experienced as a result of Rampion 2 on soil resources and agricultural land resources.

Soil is a finite resource that provides important ecosystem services, including a growing medium for food, timber and other crops; a store for carbon and water; and as a reservoir of biodiversity; and as a buffer against pollution. Agricultural land is graded in England and Wales (from 1 to 5) in order that its quality can be assessed and compared. A combination of climate, topography and soil characteristics and their unique interaction determines the limitation and grade of the land. Best and Most Versatile (BMV) agricultural land is graded 1 to 3a (MAFF, 1988) and this is the land which is most flexible, productive and efficient in response to changes.

The assessment focuses on the construction phase of Rampion 2, as at the Scoping stage of the EIA it was agreed that there are unlikely to be any significant effects on soils and agriculture during the operational and decommissioning phases of Rampion 2. During the construction phase, temporary construction areas will be required for the landfall, cable corridor, and onshore substation. Some agricultural land will therefore be taken out of active management for these periods. Permanent loss of any agricultural land will be restricted to the onshore substation site (5.9ha).

A desk-based review of literature and existing datasets has been undertaken to gather data and information on soil resources and agricultural land within the study area. Data was collated from a number of sources, including the National Soils Research Institute data, Ordnance Survey, British Geological Society (BGS), Gov.uk open data/Multi-Agency Geographic Information for the Countryside (MAGIC) website and Open-access Google Earth aerial imagery.

Baseline environment

The land near the coast is a mixture of silty soils and fine loamy soils over gravel. These soils give mainly high-quality agricultural land dominated by arable farming. On the South Downs, the soils are mainly shallow over chalk, with deeper soils in dry valleys. The South Downs has a mixture of arable and livestock farms with woodland plantation. On the Weald, heavier soils over clays are recorded which are typically wet and of moderate agricultural quality. The Weald is under grassland with variable proportions of cereal rotation.

Embedded environmental measures

A range of environmental measures which relate to soils and agriculture are embedded as part of the Rampion 2 design to remove or reduce significant environmental effects as far as possible. Examples of these measures include the following:

- **Burying the onshore cable underground for its entire length where practicable.**
- **Avoiding sensitive sites by the project footprint where practical**
- **Reinstating land to pre-existing condition as far as reasonably practical in line with Defra 2009 guidelines.**
- **Storing soil in line with Defra 2009 guidelines; and using appropriate machinery with low ground pressure to minimise soil compaction.**
- **Soil management measures will be included in a Soil Management Plan which will form part of the COCP and will be implemented during the construction phase.**

Likely significant effects

Overview

The preliminary assessment indicates that there is the potential for **Significant Effects** associated with the loss of topsoil and the temporary loss or damage to agricultural land during the construction phase. These effects will be managed and minimised as far as possible through the Soil Management Plan. Potential effects due to operation, maintenance and decommissioning have been scoped out of the assessment and **No Significant Effects** are anticipated.

Cumulative effects

No Significant Cumulative Effects have been identified at this stage in relation to Rampion 2 on soils and agriculture from construction, operation and maintenance and decommissioning activities.

Inter-related effects

No Significant Inter-related Effects of greater significance compared to the impacts considered alone were identified at this stage for soils and agriculture receptors from the construction, operation and maintenance and decommissioning of Rampion 2. However, the inter-relationship of environmental measures between soils and agriculture and other aspects will be given further consideration in the design and planning of construction works.

Transboundary effects

No Significant Transboundary Effects have been identified at this stage in relation to Rampion 2 on soils and agriculture receptors from construction, operation and maintenance, and decommissioning activities..

Next steps

Further work that will be undertaken to support the soils and agriculture assessment includes a soils survey involving observations of soil and land characteristics. The preliminary assessment will be refined and where appropriate updated to reflect the results of the surveys and the final onshore substation location and onshore cable corridor to be taken forward, along with the results of further engagement with Natural England. Updates will be incorporated into the ES.

6.6 Noise and vibration (onshore)

This section summarises the assessment findings at this point in the EIA process for noise and vibration effects, based on **Chapter 22: Noise and Vibration, Volume 2.**

How noise and vibration effects have been assessed

The preliminary assessment considers likely significant noise and vibration effects during construction and decommissioning of Rampion 2 from the following sources: construction of the onshore infrastructure (landfall, cable corridor and substation) and associated construction traffic, and during the decommissioning phase the removal of equipment and reinstating sites, including associated traffic. The preliminary assessment considers:

- residential receptors (people in their homes including their gardens and shared community open spaces such as parks); and
- non-residential receptors (including schools, hospitals, places of worship, commercial buildings, and leisure areas).

Once further design details are available, an assessment will be made of construction of offshore wind turbines (WTGs) and offshore substations, and operation and maintenance of the onshore substation and WTGs. This will consider both residential and non-residential receptors and will be reported at the ES stage.

To-date, no site surveys have been undertaken due to COVID-19 pandemic restrictions, but they are anticipated to be undertaken to inform the ES. In lieu of a baseline survey, for the preliminary assessment predicted noise and vibration have been assessed against criteria from industry standards and guidance. In addition, existing data from the assessment of the existing Rampion 1 project has been used to provide context for the assessment where practical. The following organisations have also been consulted: West Sussex Country Council (WSCC), South Downs National Park Authority (SDNPA), Highways England (HE), Arun District Council (ADC), East Sussex County Council (ESCC) and Mid Sussex District Council (MSDC).

Baseline environment

The coastline is interspersed with villages largely backed by agricultural land with the A259 running east / west. Sound levels in the area are likely to be influenced by road and rail traffic and additional sources such as gardening activities, conversation, and music closer to areas of habitation, as well as the sea on approaching the coast.

The largest settlement in the study area is Littlehampton. Sound levels here are principally likely to be influenced by local road traffic and rail traffic, as well as other sources of human activity.

Inland from the coast, the study area is predominantly rural, comprising a mosaic of arable and livestock farming land with blocks of commercial forestry. There are various isolated dwellings and some small villages throughout. Baseline sound levels are generally expected to be low and typical of a rural environment, being influenced by road traffic with additional sources of noise from human activity closer to areas of habitation.

Baseline vibration levels are likely to vary widely with localised temporary events, such as construction works. Levels of elevated vibration might be measurable adjacent to railways or poorly maintained roads. Otherwise, vibration levels are likely to be negligible for most of the study area.

Embedded environmental measures

A range of environmental measures which relate to noise and vibration are embedded as part of the Rampion 2 design to remove or reduce significant environmental effects as far as possible. Examples of these measures include the following:

- **Avoiding sensitive sites by the project footprint where practical.**
- **Implementation of measures to minimise disturbance as part of a Code of Construction Practice.**
- **Road conditions surveys before, during and after the construction phase.**

Likely significant effects

Overview

No Significant Effects have been identified at this stage in relation to potential impacts of Rampion 2 on noise and vibration from onshore construction, and decommissioning.

The operation and maintenance of the onshore substation and wind farm, and construction of offshore infrastructure will be assessed at the ES stage once further design details are available.

Cumulative effects

Cumulative effects will be assessed at the ES stage once further design details are available.

Inter-related effects

No Significant Inter-related Effects of greater significance compared to the impacts considered alone were identified at this stage for noise and vibration receptors from the construction, operation and maintenance and decommissioning of Rampion 2.

Transboundary effects

No Significant Transboundary Effects have been identified at this stage in relation to Rampion 2 on noise and vibration receptors from construction, operation and maintenance, and decommissioning activities.

Next steps

Further information on the current noise environment and conditions will be obtained from a series of noise surveys to be undertaken at locations to be agreed with relevant local authorities.

The preliminary assessment will be expanded and refined to reflect the final offshore design, onshore substation location and layout, and onshore cable corridor. It will also consider any updates to the desk study, results of noise surveys; along with further consultation and engagement be with the relevant local authorities. Updates will be incorporated into the ES.

6.7 Terrestrial ecology and nature conservation

This section summarises the assessment findings at this point in the EIA process for terrestrial ecology and nature conservation, based on **Chapter 23: Terrestrial ecology and nature conservation, Volume 2.**

How effects on terrestrial ecology and nature conservation have been assessed

The preliminary assessment has considered all ecological features (protected wildlife sites, referred to as designated sites, habitats and species) within the area that Rampion 2 could affect above mean high water springs (MHWS). This area, known as the Zone of Influence (ZOI), differs depending on the type of ecological feature considered and the nature of the potential environmental change that may arise from Rampion 2.

The assessment methodology used for biodiversity has been aligned with the standard industry guidance provided by the Chartered Institute of Ecology and Environmental Management.

The information used in the PEIR has come from a variety of sources. These include historical records of flora and fauna and descriptions of wildlife sites gained through desk study, remote sensing data collection exercise, ongoing field surveys, and meetings with groups such as Natural England (the government's advisory body on the natural environment) and other organisations which are interested in conserving wildlife including the Environment Agency, East Sussex County Council (ESCC), West Sussex County Council (WSCC), South Downs National Park Authority (SDNPA), Sussex Wildlife Trust (SWT), the Royal Society for the Protection of Birds (RSPB), Sussex Ornithological Society, Adur and Worthing District Councils, Ouse and Adur Rivers Trust, Sussex Local Nature Partnership (SLNP) and the Wildlife Trust.

Baseline environment

Surveys to establish habitat type and potential importance for nature conservation, known as 'Phase 1 habitat surveys', have been undertaken. Habitats identified within the study area include farmland, semi-natural habitats (woodland, semi-improved grassland, scrub, hedgerows and trees), ponds, rivers (River Arun and River Adur), streams and ditches, quarries and built development (roads, residential and commercial premises).

One Ramsar sites, two Special Protection Areas (SPAs) and three Special Areas of Conservation (SACs) were identified through the desk study, none of which fall within the onshore part of the PEIR Assessment Boundary. In addition, a total of fourteen Sites of Special Scientific Interest (SSSIs) and one Local Nature Reserve (LNR) were identified within 5km of Rampion 2. Of the designated sites identified, Amberley Mount to Sullington Hill SSSI is located partially within the PEIR Assessment Boundary. There are also a number of sites of importance in a county/ borough context, four are located fully or partially within the PEIR Assessment Boundary.

A number of surveys have been undertaken so far and are continuing to take place to inform the biodiversity assessment. These include surveys for habitats, bats, badgers, birds and many other species.

Embedded environmental measures

A range of environmental measures which relate to terrestrial ecology and nature conservation are embedded as part of the Rampion 2 design to remove or reduce significant environmental effects as far as possible. Examples of these measures include the following:

- **Where practical, sensitive sites will be avoided by the temporary and permanent onshore project footprint including SSSIs, Local Nature Reserves, Local Wildlife Sites, ancient woodland amongst others.**
- **Areas of temporary habitat loss will be reinstated, wherever practicable, following the completion of construction in each area.**
- **Enhancements to terrestrial ecology will be achieved through the delivery of new or improved habitats or measures to boost populations of certain species.**
- **Timing the removal of vegetation to avoid the bird breeding season.**
- **The adoption of pollution prevention and dust control techniques.**
- **Measures to avoid the spread of invasive species such as Japanese knotweed.**

Likely significant effects

Overview

Rampion 2 is predicted to have a number of likely significant effects on designated sites, habitats and species, as detailed below. These are preliminary conclusions at this stage, taking into account all embedded environmental measures. Additional work will be undertaken, to further minimise effects wherever possible, as Rampion 2 design and environmental assessment processes continue.

Designated sites

A Significant Effect is predicted on Warningcamp to New Down Local Wildlife Site due to temporary loss of calcareous semi-improved grassland, which will largely be associated with the construction phase of Rampion 2. No other significant effects to designated sites are anticipated at this stage during construction, operation and maintenance, or decommissioning.

Habitats

Significant Effects are predicted on the following habitats: semi-natural woodland, calcareous semi-improved grassland, native hedgerows, and streams, ponds and permanently wet ditches. This is due to temporary or permanent land take or land cover change, and due to changes in hydrology. This loss will largely be associated with the construction phase of Rampion 2. No other significant effects to habitats are anticipated at this stage during construction, operation and maintenance, or decommissioning.

Species

There is potential for **Significant Effects** on a number of species including bats, hazel dormouse, great crested newt and common toad. During the construction phase this is due to the temporary, and possibly permanent, loss and fragmentation of habitat, in addition to disturbance from noise, vibration and lighting. During the operation and maintenance there is potential for effects on bats close to the substation due to lighting. Within the ES, further survey information will be available on which to base a full assessment. No other significant effects to species are anticipated at this stage during construction, operation and maintenance, or decommissioning.

Cumulative effects

There is **Potential for Cumulative Effects** with the A27 Arundel Bypass and Rampion 2 across a relatively localised area where the two projects intersect. If the construction works take place at the same time there may be disruption to the use of habitats for foraging, commuting and sheltering by a number of species including bats, dormice and badgers.

Inter-related effects

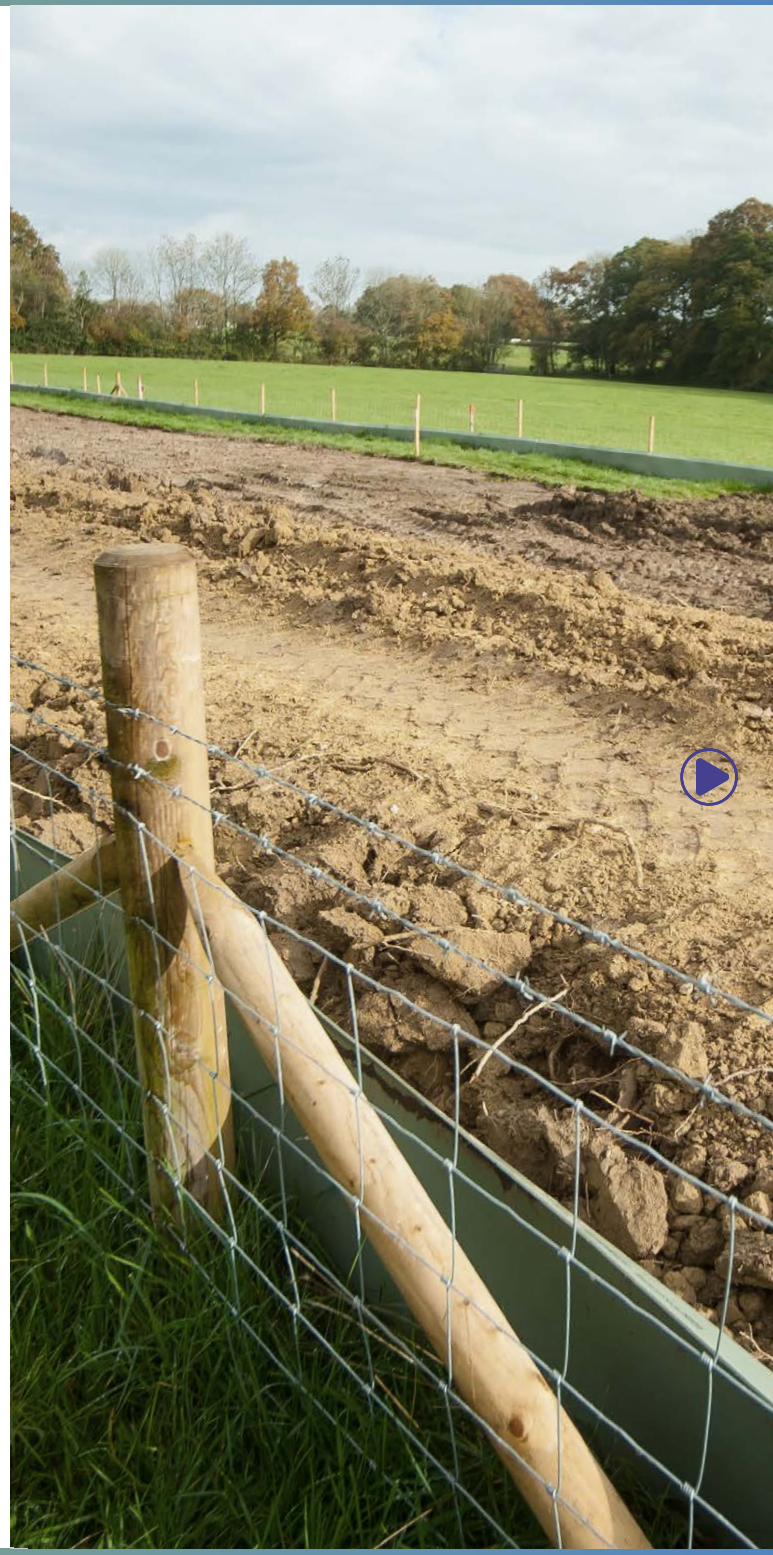
No Significant Inter-related Effects of greater significance compared to the impacts considered alone were identified at this stage for terrestrial ecology and nature conservation receptors from the construction, operation and maintenance, and decommissioning of Rampion 2.

Transboundary effects

No Significant Transboundary Effects have been identified at this stage in relation to Rampion 2 on terrestrial ecology and nature conservation receptors from construction, operation and maintenance, and decommissioning activities.

Next steps

The preliminary assessment will be refined and where appropriate updated to reflect the final onshore substation location and onshore temporary cable corridor to be taken forward and any updates to the desk study; results of an ongoing extensive programme of field survey is which will inform the assessment provided in the ES, along with the results of further consultation and engagement be with Natural England and other organisations which are interested in conserving wildlife.



6.8 Transport

This section summarises the assessment findings at this point in the EIA process for transport, based on **Chapter 24: Transport, Volume 2.**

How transport effects have been assessed

The preliminary assessment has considered the likely significant effects of Rampion 2 during construction, operation and decommissioning on transport network users such as pedestrians, cyclists, public transport users and vehicle drivers and passengers.

The information used in the PEIR is based on a desk study and site visit which included a review of the overall road network, public transport and accident data from national and local government sources.

Due to the COVID-19 pandemic restrictions it has not been possible to undertake traffic surveys that would be representative of baseline conditions, and so it has been agreed with West Sussex Country Council (WSCC) and Highways England (HE) to use historic traffic data. This approach has been applied to this preliminary assessment. It was also agreed that should COVID-19 pandemic restrictions be lifted later in 2021 then site specific traffic data can be surveyed to inform the ES which will accompany the DCO Application.

As part of the assessment transport modelling has been undertaken to understand the effects of traffic generated by Rampion 2 on the road network.

The following organisations have also been consulted: WSCC, South Downs National Park Authority (SDNPA), Highways England (HE), South Downs National Park Authority (SDNPA); Arun District Council (ADC), East Sussex County Council (ESCC) and Mid Sussex District Council (MSDC).

Baseline environment

The public highway network comprises the strategic road network, which is managed and maintained by Highways England and the local road network, which is managed and maintained by the relevant local authorities. Roads within the strategic road network that are proposed to be used for access include the A23 and A27. For the local road network this includes the A24, A26, A259, A272, A280, A281, A283, B2109, B2116, B2117 and B2118 and connecting roads. Information obtained from the Department for Transport has identified a number of accidents that have occurred on the highway network surrounding Rampion 2, however it is not considered there is a significant accident record on the local highways network.

Bus services are in operation between major settlements in the area, in addition there are two principal railway lines, one line running along the south coast between Brighton and Portsmouth and one line between Horsham and Portsmouth. The onshore temporary cable corridor, onshore substation and landfall, as well as temporary and permanent accesses potentially affect a number of Public Rights of Way (PRoWs), one of which is the South Downs Way, a National Trail.

The onshore temporary cable corridor will cross two parts of the Sustrans national cycle network (NCN): NCN 2 and 223. At Newhaven Port the nearest element of the NCN is NCN 2 which runs along the B2109 across the junction with Railway Road.

The onshore temporary cable corridor has numerous crossings of roads including the A289, A27, A24, A283, B2135, B2116 and A281. There is also one crossing of the River Arun and two crossings of the National Rail network west of Littlehampton and Wick.

Embedded environmental measures

A range of environmental measures relating to transport network users are embedded as part of Rampion 2. Examples of these measures include the following:

- **Routeing of heavy goods vehicles (HGV) during the construction period to avoid Air Quality Management Areas, the A24 through Findon and major settlements, such as Storrington, Cowfold, Steyning, Wineham, Henfield, Woodmancote and other smaller settlements, where possible.**
- **Main rivers, watercourses, railways and roads that form part of the Strategic Highways Network will be crossed by HDD or other trenchless technology where this represents the best environment solution and is financially and technically feasible.**
- **An Outline Construction Traffic Management Plan (CTMP) will be developed in consultation with West Sussex County Council which will set out the approach to managing and minimising the impact of the construction traffic on the transport network.**
- **An Outline Public Rights of Way Management Plan (PRoWMP) will be developed in consultation with West Sussex County Council which will set out the approach to managing the use of PRoWs during construction.**

Likely significant effects

Overview

Based on the proposed location of the onshore substation and routing of the onshore cable corridor, plus the incorporation of appropriate embedded environmental measures (such as the Outline CTMP and Outline PRoWMP), **No Significant Effects** have been identified at this stage in relation to transport receptors from Rampion 2 construction, operation and maintenance, and decommissioning.

Cumulative effects

No **Significant Cumulative Effects** are anticipated at this preliminary stage, however, the status of the A27 Arundel bypass will continue to be monitored and the assessment of any potential cumulative effects included in the ES, as necessary.

Inter-related effects

No Significant Inter-related Effects of greater significance compared to the impacts considered alone were identified at this stage for transport receptors from the construction, operation and maintenance, and decommissioning of Rampion 2.

Transboundary effects

No Significant Transboundary Effects have been identified at this stage in relation to Rampion 2 on transport receptors from construction, operation and maintenance, and decommissioning activities.

Next steps

Further work will be undertaken to support the transport assessment that will be presented within the ES. This will include further engagement with relevant stakeholders, and further baseline gathering, including traffic surveys which are to be undertaken following the lifting of UK COVID-19 pandemic restrictions. The results from these surveys will be used to update our understanding of current traffic movements.

6.9 Ground conditions

This section summarises the assessment findings at this point in the EIA process for ground conditions, based on **Chapter 25: Ground conditions, Volume 2.**

How effects on ground conditions have been assessed

The preliminary assessment has considered the likely significant effects of Rampion 2 on ground conditions, including land contamination, geohazards such as unstable ground conditions and settlement, and geodiversity, which includes, for example, Geological Sites of SSSI. Potential effects which have been assessed include the exposure of the workforce to health impacts, encountering contamination during intrusive works, physical intrusion into groundwater, and dewatering of trenches and excavations.

Information on existing ground conditions is based on data requests from a number of sources, including the Ordnance Survey, British Geological Society (BGS, government and local authority records, and through consultation with the Environment Agency, Natural England and relevant local authorities.

The assessment has considered the geographical area in which there could be impacts from Rampion 2 on ground conditions which could affect human health, the groundwater and surface water environment and geological sites (known as the Zone of Influence) during the construction, operation and decommissioning phases.

Baseline environment

At the landfall location and around Arundel the geology underlying Rampion 2 is made up of a range of near surface deposits including sand, gravel and clays with a predominantly Chalk bedrock. In relation to the onshore temporary cable corridor, much of the solid geology is Weald Clay and sandstone. Groundwater is likely to be present in chalk, sands, gravels and clays.

The main hydrogeological formation is Chalk, which the Environment Agency classifies as a Principal Aquifer. Environment Agency data also indicates that there are a number of existing groundwater abstractions and source protection zones (SPZs) to the northeast of Arundel. Numerous ponds and streams are also present within the study area, with the onshore temporary cable corridor crossing two rivers (the River Arun and the River Adur).

There is one geological SSSI present within 2km of the study area (Chantry Mill SSSI), alongside five Locally Important Geological Sites (LIGSs). There are also a number of potential sources of contamination in the area of Rampion 2: historical and authorised landfills, sewage treatment works, infilled ground, service stations and industrial operations.

Embedded environmental measures

A range of environmental measures which relate to ground conditions are embedded as part of the Rampion 2 design to remove or reduce significant environmental effects as far as possible. Examples of these measures include the following:

- **Avoiding sensitive sites by the project footprint where practical.**
- **Implementation of pollution prevention measures as part of a Code of Construction Practice (COCP).**
- **RED will ensure that the land used for the Proposed Development is suitable for the proposed use with respect to the potential for soil and groundwater contamination and, where necessary, undertake risk-based remediation.**

Likely significant effects

Overview

Based on the proposed location of the onshore substation and routing of the onshore temporary cable corridor, plus the incorporation of appropriate embedded environmental measures such as the COCP, **No Significant Effects** have been identified at this stage on ground conditions from construction, operation and maintenance, and decommissioning.

Cumulative effects

No Significant Cumulative Effects have been identified at this stage in relation to Rampion 2 on ground conditions from construction, operation and maintenance, and decommissioning activities.

Inter-related effects

No Significant Inter-related Effects of greater significance compared to the impacts considered alone were identified at this stage for ground conditions receptors from the construction, operation and maintenance, and decommissioning of Rampion 2.

Transboundary effects

No Significant Transboundary Effects have been identified at this stage in relation to Rampion 2 on ground conditions receptors from construction, operation and maintenance, and decommissioning activities

Next steps

The preliminary assessment will be refined and where appropriate updated to reflect the final onshore substation location and onshore temporary cable corridor to be taken forward and any updates to the desk study; along with the results of further consultation and engagement be with the Environment Agency and local authorities. Updates will be incorporated into the ES.

6.10 Historic environment (onshore)

This section summarises the assessment findings at this point in the EIA process for historic environment, based on **Chapter 26: Historic environment, Volume 2.**

How effects on the historic environment have been assessed

The preliminary assessment has considered the likely significant effects of Rampion 2 on the onshore historic environment above Mean High Water Springs (MHWS), including archaeology, historic buildings/structures, and historic landscapes. Potential effects which have been assessed include direct effects (for example, loss of archaeology) and indirect effects (for example, change in the setting of a heritage feature) on designated heritage assets (such as Scheduled Monuments, Listed Buildings, Registered Parks and Gardens and Conservation Areas) and non-designated heritage assets (such as features and deposits of archaeological interest) and the historic landscape character. The preliminary assessment has considered the geographical area in which there could be impacts from the onshore infrastructure (landfall, cable connection and substation) and also the offshore works on the settings of onshore heritage assets during the construction, operation and decommissioning phases.

Information on the existing historic environment is based on a site walkover and a desk study, which involved the collation of data from a range of sources including: Historic England's National Heritage List for England (NHLE), West Sussex Historic Environment Record (HER), UK Hydrographic Office (UKHO), Ordnance Survey (OS), government and local authority records, and consultation with the South Downs National Park, Natural England and relevant local authorities.

In addition, in order to understand the existing historic environment and associated potential issues, engagement has taken place with the Conservation Officer at Arun District Council (ADC), Chichester District Council (CDC) Archaeologist, the Conservation Officer at Horsham District Council (HDC), the National Trust, Historic England and West Sussex County Council (WSCC) Archaeologist.

Baseline environment

The southern part of the PEIR Assessment Boundary is coastal landscape and is characterised by agricultural improvement and urban expansion, punctuated with historic farmsteads and hamlets.

The South Downs landscape in the central part of the PEIR Assessment Boundary comprises a broad elevated east–west ridge with a predominantly steep, north facing scarp slope and a gentle southerly dip slope. The landscape is dominated by large open arable and grassland fields of the downlands. There are pockets of woodland and a historic settlement at Crossbush as well as scattered isolated 18th and 19th farmsteads.

In the northern part of the PEIR Assessment Boundary the landscape comprises the gently undulating low-lying vales of the Low Weald. The landscape here is dominated by fields developed through a mixture of clearing undertaken in the medieval era, medieval and post medieval piecemeal enclosure, and modern field amalgamation.

In relation to designated heritage assets, a single scheduled monument falls partly within the PEIR Assessment Boundary, which comprises a group of four bowl barrows at the Chantry Post. The PEIR Assessment Boundary also crosses three conservation areas, including Burpham and Wepham Conservation Area, Warningcamp Conservation Area, and Lyminster Conservation Area. There are no further designated heritage assets located within the PEIR Assessment Boundary.

Within the wider study area there are a further 19 scheduled monuments; 326 listed buildings; 6 conservation areas; and a Registered Park and Garden (grade II* listed Arundel Castle). There are no world heritage sites, registered battlefields, protected wreck sites or protected military sites within the study area. There are also a large number of non-designated heritage assets in the study area representing all periods from the Palaeolithic to modern and comprise a range of record types including small find locations, historic landscapes, farmsteads, extant monuments, earthworks, buildings, military structures, memorials, telephone boxes, and archaeological sites and deposits.

Embedded environmental measures

A range of environmental measures which relate to the historic environment are embedded as part of the Rampion 2 design to remove or reduce significant environmental effects as far as possible. Examples of these measures include the following:

- **Avoiding sensitive sites by the project footprint where practical including National Trust Land, Listed Buildings and Scheduled Monuments.**
- **Implementation of measures such as an agreed programme of archaeological recording and dissemination to mitigate any significant adverse effects during construction.**

Likely significant effects

Overview

There is the potential for a number of **Significant Effects** from Rampion 2 on the historic environment. During the construction phase these include the potential impact, in certain locations, on archaeological heritage assets, changes to the setting of heritage assets and change to historic landscape character. There is also the potential for **Significant Effects** from the onshore substation on the setting of heritage assets during the operational phase. Potential impacts during decommissioning of the onshore substation and offshore substation and WTGs will be expected to be the same as those effects identified for the construction phase. Removal of infrastructure will mitigate any visual and audible impacts arising during the operation and maintenance phase.

Cumulative effects

The cumulative effects of Rampion 2 with 'other developments' has also been considered and there exists the **Potential for Cumulative Effects** during the construction phase with the proposed A27 Arundel Bypass (Highways England) and the Mulgrave Properties development near the proposed landfall site. **No Other Significant Cumulative Effects** have been identified for the operation and maintenance, and decommissioning phases.

Inter-related effects

No Significant Inter-related Effects of greater significance compared to the impacts considered alone were identified at this stage for historic environment receptors from the construction, operation and maintenance, and decommissioning of Rampion 2.

Transboundary effects

No Significant Transboundary Effects have been identified at this stage in relation to Rampion 2 on historic environment receptors from construction, operation and maintenance, and decommissioning activities.

Next steps

The preliminary assessment will be refined and where appropriate updated to reflect the final Rampion 2 design to be taken forward. Any updates to the understanding of the historic environment baseline resulting from, for example, further desk study, targeted site walkovers and visits to heritage assets, geophysical surveys and where appropriate archaeological trial trenching; along with further consultation and engagement be with Historic England, relevant Conservation Officers and County Archaeologists will be incorporated into the ES.

6.11 Water environment

This section summarises the assessment findings at this point in the EIA process for water environment, based on **Chapter 27: Water environment, Volume 2.**

How effects on the water environment have been assessed

The preliminary assessment has considered likely significant effects of Rampion 2 on the water environment, which comprises the aquatic environment, water resources and flood risk receptors, during the construction, operation and decommissioning phases. This includes effects on water quality, river flows, groundwater levels, and physical changes to rivers, lakes and other water features, as well as effects on water supply. The assessment is accompanied by a Flood Risk Screening Report which will form the basis of a Flood Risk Assessment (FRA.

The information used in the PEIR has been gathered through a desk study reviewing available data and consultation with the Environment Agency, Natural England, West Sussex County Council and relevant local authorities.

Baseline environment

The onshore part of the PEIR Assessment Boundary extends approximately 36km from the landfall at Climping in the River Arun catchment to the potential onshore substation search areas in the proximity of Wineham and Bolney within the River Adur catchment, crossing a number of watercourses, including the River Arun and tributaries of both the River Arun and River Adur.

Beneath the surface, groundwater is likely to be present in chalk, sands, gravels and clays. The main hydrogeological formation is Chalk, which the Environment Agency classifies as a Principal Aquifer.

The South East River Basin Management Plan sets out the 'status' of rivers, lakes and groundwater bodies, according to the requirements of the Water Framework Directive (WFD). 'Status' is based on the quality of the water body, which includes physical, chemical and biological characteristics, and ranges from Bad to High. There are 23 WFD water bodies in the study area, of which 17 have a potential for a connection with Rampion 2.

There are eight water dependent conservation sites within the study area, of which Arundel Park SSSI and Arun Valley, Amberly Mount to Sullington Hill SSSI, Watersfield to Arundel Local Wildlife Site (LWS), Bines Green LWS and Rock Common Sand Quarry Local Geological Site (LGS) have been taken forward for assessment due to their location in proximity to Rampion 2.

Within the vicinity of Rampion 2 there are a variety of sources of flood risk, including from rivers (including the Rivers Arun and Adur and their tributaries), groundwater, surface water and artificial sources.

The study area intersects a number of source protection zones which are classified as Safeguard Zones and Drinking Water Protected Areas.

In addition, within the vicinity of Rampion 2 there are a number of licensed abstractions, the majority of which take water from groundwater, as well as smaller private water supplies that do not require a licence. There are also consented discharges to both groundwater and surface waters.

The baseline conditions may be influenced in the future by changes to the climate and land use, and by improvements to land and water quality as a result of legislation, policy and other drivers.

Embedded environmental measures

A range of environmental measures which relate to the water environment are embedded as part of the Rampion 2 design to remove or reduce significant environmental effects as far as possible. Examples of these measures include the following:

- **Avoiding sensitive sites by the project footprint where practical.**
- **Drainage design measures to manage, attenuate and, if necessary, treat surface water run-off will be included in all elements of temporary and permanent infrastructure in accordance with Sustainable Drainage principles.**
- **In line with good practice, Pollution Prevention Plans will be drawn up to detail how ground and surface waters will be protected during construction and operation.**

Likely significant effects

Overview

Based on the proposed location of the onshore substation and routing of the onshore cable corridor, plus the incorporation of appropriate embedded environmental measures, **No Significant Effects** have been identified at this stage on the water environment from construction, operation and maintenance, and decommissioning.

Cumulative effects

No Significant Cumulative Effects have been identified at this stage in relation to Rampion 2 on the water environment from construction, operation and maintenance, and decommissioning activities.

Inter-related effects

No Significant Inter-related Effects of greater significance compared to the impacts considered alone were identified at this stage for water environment receptors from the construction, operation and maintenance, and decommissioning of Rampion 2.

Transboundary effects

No Significant Transboundary Effects have been identified at this stage in relation to Rampion 2 on water environment receptors from construction, operation and maintenance, and decommissioning activities.

Next steps

The preliminary assessment will be refined and where appropriate updated to reflect the final onshore substation location and onshore temporary cable corridor to be taken forward and any updates to the desk study, along with the results of site walkover and further consultation and engagement with the Environment Agency, West Sussex County Council, local authorities and private water supply users. This will be presented in the ES.

In addition, a Flood Risk Assessment will build upon the findings of the initial screening assessment and will set out measures that may be necessary to address flood risk as a result of Rampion 2. A Water Framework Directive Assessment will also be undertaken to determine whether any potential effects will lead to a deterioration in the overall health of the water environment.

6.12 Major accidents and disasters

This section summarises the assessment findings at this point in the EIA process for major accidents and disasters, based on **Chapter 28: Major accidents and disasters, Volume 2.**

How major accident and disaster effects have been assessed

A 'major accident' has been defined as something that occurs as a result of an uncontrolled event caused by a man-made activity or asset that leads to immediate or delayed serious damage. The term 'disaster' describes a natural event that leads to serious damage, again either immediate or delayed. Major accidents or disasters can lead to the loss of life and injury in large numbers, and/or major and long-term damage to environmental or historic features of high importance.

The preliminary assessment has looked at all realistic 'worst case' hazards that may lead to a major accident or disaster. Hazards that could occur during either construction, operation or decommissioning of Rampion 2 are considered, so that all potential major accidents or disasters are captured and assessed. The approach is based on established approaches for assessing major accident and disaster risk assessment and associated tolerability. The preliminary assessment looks at potential major accidents or disasters that could occur, both as a result of Rampion 2, or that could occur externally but have knock-on effects to Rampion 2.

The assessment is risk-based as major accidents and disasters are infrequent events. Therefore, this assessment takes account of how likely the potential major accident or disaster is to occur, as well as the level of damage or casualty it can cause.

The assessment has identified potential major accident and disaster sources, the human and environmental receptors in vicinity of Rampion 2, and the route or 'pathways' by which a source may affect each of these receptors, to understand which major accidents or disasters hazards are feasible. An assessment has then been made of the likelihood of it occurring, and the damage or injury it could cause, to understand which potential major accidents and disasters are considered to be either 'significant' or 'not significant'.

Baseline environment

The baseline conditions relevant to the major accidents and disasters assessment have largely been informed by other environmental topics' baseline data. For example, information about the location and designations of ecological features is informed by the terrestrial ecology and nature conservation topic.

A desk study has been undertaken to identify potential major accident and disaster sources, this includes information from the Health and Safety Executive (HSE) and Companies House. Consultation has also been undertaken with West Sussex County Council (WSCC), Public Health England (PHE) and the HSE.

Embedded environmental measures

The Rampion 2 design includes a number of embedded environmental measures designed to avoid or minimise potential major accidents or disasters. Examples of these measures include the following:

- **Safety zones will be sought around offshore infrastructure during construction, maintenance and decommissioning phases.**
- **Developing Emergency Response Plans.**
- **Undertaking a risk assessment of the potential impacts of major accidents and disasters.**
- **Carrying out vehicle maintenance and refuelling of machinery within designated areas where spillages can be easily contained.**
- **Avoiding sensitive sites by the project footprint where practical.**

Likely significant effects

Overview

When the embedded environmental measures to prevent, control and limit the potential for major accidents and disasters during the lifetime of Rampion 2 are taken into account, the likelihood of a major accident and disaster occurring will be low enough that there are **No Significant Effects** arising from major accident and disasters during construction, operation and maintenance, and decommissioning.

Cumulative effects

No Significant Cumulative Effects have been identified at this stage in relation to Rampion 2 on major accidents and disasters from construction, operation and maintenance, and decommissioning activities.

Inter-related effects

No Significant Inter-related Effects of greater significance compared to the impacts considered alone were identified at this stage for major accidents and disasters receptors from the construction, operation and maintenance, and decommissioning of Rampion 2.

Transboundary effects

No Significant Transboundary Effects have been identified at this stage in relation to Rampion 2 on major accidents and disasters receptors from construction, operation and maintenance, and decommissioning activities.

Next steps

Embedded environmental measures will be further developed as the design of Rampion 2 progresses and reported in the ES. This will ensure that the risk of major accidents and disasters is appropriately managed. Further consultation will take place with West Sussex County Council, HSE, MCA and the EA.

7. Have your say

Following the end of the PEIR Consultation period (September 2021), RED will consider all comments that have been received in order to identify potential improvements for Rampion 2.

What happens next?

To capture participants' feedback, RED have provided a consultation questionnaire inviting comments. The questionnaire is available on the Rampion 2 website **www.Rampion2.com.** alongside the other consultation documents, but participants may also request fillable copies by email or a hard copy by mail.

Following the consultation, RED will consider all the views received and will continue to develop the Rampion 2 design ahead of submitting the DCO Application to the Secretary of State. The environmental assessments will be reviewed and updated for the final Environmental Statement, based on consultation responses, design refinements and additional information that becomes available from site visits and surveys. It is expected that the Environmental Statement to accompany the DCO Application will be submitted in early 2022. The DCO Application will include a Consultation Report setting out how all responses received have been considered.

Any comments received will be analysed and may be made available in due course to the Secretary of State, the Planning Inspectorate and other relevant statutory authorities so that feedback can be considered as part of the DCO process. RED will ensure that any personal details are not placed on public record, will be held securely by Rampion Extension Development Ltd and its agents in accordance with the data protection laws and will be used solely in connection with the consultation process and subsequent DCO application and, except as noted above, will not be passed to third parties.

What if I would like further information?

This document is a non-technical summary of the PEIR for the proposed Rampion 2 Offshore Wind Farm. The full PEIR, which provides more detailed information, is available to view on the following link: **www.Rampion2.com.**

8. How can I contact RED?

The RED team is on hand to help with queries and register your comments on the proposals for Rampion 2. You can get in touch in the following ways:

- **Email: rampion2@rwe.com**
- Call the freephone information line at: **0800 2800 886**
- Visit the Rampion 2 website at: www.Rampion2.com
- Follow on Instagram **@rampion2windfarm**

If you are a landowner, have an interest in any of the land which interacts with our proposals, or if you have any questions relating to land interests in the area, please contact RED's appointed land agents from Carter Jonas by:

- Calling: **0121 794 6250**
- Emailing: **rampion2@carterjonas.co.uk**

If you or someone you know requires this document in another language, large print, audio or braille formats, please contact RED using the details provided above.


Rampion 2
WIND FARM