



Volume 4, Chapter 5

Approach to the EIA Appendices





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Volume 4, Appendix 5.1 **Responses to the Scoping Opinion**



Table 1-1Responses to the Scoping Opinion

ID	PINS comments	Aspect	How this has been addressed in this PEIR
1	INTRODUCTION		
1.1	Background		
1.1.1	On 02 July 2020, the Planning Inspectorate (the Inspectorate) on behalf of the Secretary of State (SoS) received a scoping request from Rampion Extension Development Limited ('RED') (the Applicant) under Regulation 10 of the Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (the EIA Regulations) for the proposed Rampion 2 Offshore Wind Farm (the Proposed Development).	General	N/A (no response required)
1.1.2	In accordance with Regulation 10 of the EIA Regulations, an Applicant may ask the SoS to state in writing its opinion 'as to the scope, and level of detail, of the information to be provided in the environmental statement'.	General	N/A (no response required)
1.1.3	This document is the Scoping Opinion (the Opinion) provided by the Inspectorate on behalf of the SoS in respect of the Proposed Development. It is made on the basis of the information provided in the Applicant's report entitled 'Rampion 2 Offshore Wind Farm Environmental Impact Assessment Scoping Report' (the	General	N/A (no response required)

ID	PINS comments	Aspect	How this has been addressed in this PEIR
	Scoping Report). This Opinion can only reflect the proposals as currently described by the Applicant. The Scoping Opinion should be read in conjunction with the Applicant's Scoping Report.		
1.1.4	The Applicant has notified the SoS under Regulation 8(1)(b) of the EIA Regulations that they propose to provide an Environmental Statement (ES) in respect of the Proposed Development. Therefore, in accordance with Regulation 6(2)(a) of the EIA Regulations, the Proposed Development is EIA development.	General	N/A (no response required)
1.1.5	Regulation 10(9) of the EIA Regulations requires that before adopting a Scoping Opinion the Inspectorate must take into account: (a) any information provided about the proposed development;	General	N/A (no response required)
	(b) the specific characteristics of the development;		
	(c) the likely significant effects of the development on the environment; and		
	(d) in the case of a subsequent application, the environmental statement submitted with the original application."		

ID	PINS comments	Aspect	How this has been addressed in this PEIR
1.1.6	This Opinion has taken into account the requirements of the EIA Regulations as well as current best practice towards preparation of an ES.	General	N/A (no response required)
1.1.7	The Inspectorate has consulted on the Applicant's Scoping Report and the responses received from the consultation bodies have been taken into account in adopting this Opinion (see Appendix 2).	General	N/A (no response required)
1.1.8	The points addressed by the Applicant in the Scoping Report have been carefully considered and use has been made of professional judgement and experience in order to adopt this Opinion. It should be noted that when it comes to consider the ES, the Inspectorate will take account of relevant legislation and guidelines. The Inspectorate will not be precluded from requiring additional information if it is considered necessary in connection with the ES submitted with the application for a Development Consent Order (DCO).	General	N/A (no response required)
1.1.9	This Opinion should not be construed as implying that the Inspectorate agrees with the information or comments provided by the Applicant in their request for an opinion from the Inspectorate. In particular, comments from the Inspectorate in this Opinion are without prejudice to any later decisions taken (eg on submission of the application) that any development identified by the Applicant is necessarily to be treated as	General	N/A (no response required)

ID	PINS comments	Aspect	How this has been addressed in this PEIR
	part of a Nationally Significant Infrastructure Project (NSIP) or Associated Development or development that does not require development consent.		
1.1.10	 Regulation 10(3) of the EIA Regulations states that a request for a scoping opinion must include: (a) a plan sufficient to identify the land; (b) a description of the proposed development, including its location and technical capacity; 	General	N/A (no response required)
	 (c) an explanation of the likely significant effects of the development on the environment; and (d) such other information or representations as the person making the request may wish to provide or make. 		
1.1.11	The Inspectorate considers that this has been provided in the Applicant's Scoping Report. The Inspectorate is satisfied that the Scoping Report encompasses the relevant aspects identified in the EIA Regulations.	General	This comment is acknowledged.
1.1.12	In accordance with Regulation 14(3)(a), where a scoping opinion has been issued in accordance with Regulation 10 an ES accompanying an application for an order granting development consent should be based on 'the most recent scoping opinion adopted (so far as the proposed development remains materially the same as	General	This comment is acknowledged. The Environmental Statement (ES) accompanying the DCO Application will be based on the most recent Scoping Opinion adopted.



ID	PINS comments	Aspect	How this has been addressed in this PEIR
	the proposed development which was subject to that opinion)'.		
1.1.13	The Inspectorate notes the potential need to carry out an assessment under The Conservation of Habitats and Species Regulations 2017 and The Conservation of Offshore Marine Habitats and Species Regulations 2017 (the Habitats Regulations). This assessment must be co-ordinated with the EIA in accordance with Regulation 26 of the EIA Regulations. The Applicant's ES should therefore be co-ordinated with any assessment made under the Habitats Regulations.	General	This comment is acknowledged. The ES will be co-ordinated with any assessment under the Habitats Regulations.
1.2	The Planning Inspectorate's Consultation		
1.2.1	In accordance with Regulation 10(6) of the EIA Regulations the Inspectorate has consulted the consultation bodies before adopting this Scoping Opinion. A list of the consultation bodies formally consulted by the Inspectorate is provided at Appendix 1. The consultation bodies have been notified under Regulation 11(1)(a) of the duty imposed on them by Regulation 11(3) of the EIA Regulations to make information available to the Applicant relevant to the preparation of the ES. The Applicant should note that whilst the list can inform its consultation, it should not be relied upon for that purpose.	General	This comment is acknowledged.

ID	PINS comments	Aspect	How this has been addressed in this PEIR
1.2.2	The list of respondents who replied within the statutory timeframe and whose comments have been taken into account in the preparation of this Opinion is provided, along with copies of their comments, at Appendix 2, to which the Applicant should refer in preparing its ES.	General	N/A (no response required)
1.2.3	The ES submitted by the Applicant should demonstrate consideration of the points raised by the consultation bodies. It is recommended that a table is provided in the ES summarising the scoping responses from the consultation bodies and how they are, or are not, addressed in the ES.	General	This comment is acknowledged. The ES will set out how responses from consultation bodies have been addressed.
1.2.4	Any consultation responses received after the statutory deadline for receipt of comments will not be taken into account within this Opinion. Late responses will be forwarded to the Applicant and will be made available on the Inspectorate's website. The Applicant should also give due consideration to those comments in preparing its ES.	General	This comment is acknowledged.
1.3	The European Union (Withdrawal Agreement) Act 202	0	
1.3.1	The UK left the European Union as a member state on 31 January 2020. The European Union (Withdrawal Agreement) Act 2020 gives effect to transition arrangements that last until the 31 December 2020. This provides for EU law to be retained as UK law and also	General	N/A (no response required)



ID	PINS comments	Aspect	How this has been addressed in this PEIR
	brings into effect obligations which may come into force during the transition period.		
1.3.2	This Scoping Opinion has been prepared on the basis of retained law and references within it to European terms have also been retained for consistency with other relevant documents including relevant legislation, guidance and advice notes.	General	This comment is acknowledged.
2	THE PROPOSED DEVELOPMENT		
2.1	Introduction		
2.1.1	The following is a summary of the information on the Proposed Development and its site and surroundings prepared by the Applicant and included in their Scoping Report. The information has not been verified and it has been assumed that the information provided reflects the existing knowledge of the Proposed Development and the potential receptors/ resources.	General	N/A (no response required)
2.2	Description of the Proposed Development	General	N/A (no response required)
2.2.1	The Applicant's description of the Proposed Development, its location and technical capacity (where	General	N/A (no response required)



ID	PINS comments	Aspect	How this has been addressed in this PEIR
	relevant) is provided in sections 1.1 and 2.3 of the Scoping Report.		
2.2.2	The Proposed Development relates to a new offshore wind farm with and installed capacity of up to 1.2 gigawatts (GW). The Proposed Development is located adjacent to the existing Rampion Offshore Wind Farm ('Rampion 1') in the English Channel, 14km off the coast of Brighton & Hove and approximately 30km east of the Isle of Wight. A location plan is provided in Figure 1.1 of the Scoping Report.	General	N/A (no response required)
2.2.3	 The Proposed Development comprises both onshore and offshore infrastructure components as follows : Offshore wind turbine generators (WTGs) and associated foundations and inter-array cabling Up to three offshore substations; Up to four offshore export cables (within a defined cable corridor) A 'landfall' site using Horizontal Directional drilling (HDD) installation techniques to bring offshore cables onshore through up to four transition bays near Climping and Littlehampton; Onshore cabling in a single corridor approximately 36km in length; and 	General	N/A (no response required)

ID	PINS comments	Aspect	How this has been addressed in this PEIR
	 A new onshore substation that will connect to the existing substation at Bolney, Mid Sussex. 		
2.2.4	The Scoping Report explains that the number of WTGs to be installed for the Proposed Development would not exceed the number of WTGs installed for the Rampion 1 Offshore Wind Farm. Table 2.2 of the Scoping Report sets out that this will be up to 116 WTGs and also sets out other parameters of the offshore components (eg maximum height to blade tip, foundation types, export cable specifications etc, to the extent that they are known at this stage).	General	N/A (no response required)
2.2.5	The offshore elements of the Proposed Development are situated within an "Area of Search" adjacent to the south east and west of the existing Rampion 1 project. A small area to adjoin / 'bridge' the two areas to enable cabling requirements across the full offshore area of the Proposed Development. These areas are shown on Figure 2.8 of the Scoping Report.	General	N/A (no response required)
2.2.6	Table 2.3 sets out parameters for the onshore cabling components, for the connection to the National Grid transmission system. As well as the transmission cables, the Proposed Development requires the construction of a new substation and the Applicant is currently considering a number of candidate 'satellite' sites (within a radius of 5km of the existing Bolney	General	N/A (no response required)

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ID	PINS comments	Aspect	How this has been addressed in this PEIR
	substation). The anticipated area required for the substation is up to 4.5 hectares (ha). The connection to the existing Bolney substation would require underground cables and minor upgrades.		
2.2.7	The construction of the Proposed Development is anticipated to take up to five years, as set out in Figure 2.7 of the Scoping Report. During operation, some routine and corrective maintenance activities will be required as set out in paragraphs 2.3.50 – 2.3.56 of the Scoping Report. The operational lifetime of the Proposed Development is assumed to be a minimum of 30 years, followed by a period of decommissioning (likely to be undertaken broadly in reverse to the sequence of construction works and involving similar levels of equipment and activity).	General	N/A (no response required)
2.3	The Planning Inspectorate's Comments		
2.3.1	 Description of the Proposed Development The ES should include the following: A description of the Proposed Development comprising at least the information on the site, design size and other relevant features of the 	General	A clear explanation of the Proposed Development presented in the Preliminary Environmental Information Report (PEIR) is provided throughout Chapter 4: The Proposed Development. The PEIR is a stage in a process of opgoing refinements to the design, which will
	development; and		continue into the ES. Final land-use requirements

ID	PINS comments	Aspect	How this has been addressed in this PEIR
	• A description of the location of the development and description of the physical characteristics of the whole development, including any requisite demolition works and the land-use requirements during construction and operation phases.		and any requisite non-residential demolition works will be refined and presented in the ES.
2.3.2	Paragraphs 2.3.50 – 2.3.56 of the Scoping Report provides some detail on operation and maintenance activities. The ES should provide a full description of the nature and scope of these activities, including the types of activity, their frequency, and how works will be carried out for both the onshore and offshore elements of the Proposed Development. This should include consideration for the potential overlapping of activities with those required for the continuing operation of Rampion 1.	General	Chapter 4, Section 4.6 provides a description of the nature and scope of operation and maintenance activities, including the types of activity, their frequency, and how works will be carried out for both the onshore and offshore elements of the Proposed Development. Further details will be provided in the ES.
2.3.3	Paragraph 2.3.56 and subsequent aspect sections of the Scoping Report address decommissioning in respect of the Proposed Development. The ES should include the rationale in support of the assessment of potential significant effects during the decommissioning phase, including a description of anticipated decommissioning activities (eg where the magnitude of impact is similar to that during construction). Where there is uncertainty of impacts during decommissioning this should be clearly explained along with the implications for the assessment of significant effects (including assumptions and	General	Chapter 4 of this PEIR (Section 4.7) provides a description of anticipated decommissioning activities. The effects arising during the decommissioning phase are assessed in aspect Chapters 6 to 28.

ID	PINS comments	Aspect	How this has been addressed in this PEIR
	mitigation on which reliance is placed). For example, there is reference to a "decommissioning plan" but production of such a document does not appear in the Applicant's scoping commitments register (Scoping Report appendix 2).		
2.3.4	Offshore Inter-array cabling and offshore export cables are described as having a "Target depth" for burial of 1m (dependant on cable burial risk assessment). The cable burial risk assessment is recorded as commitment C-45 in appendix A of the Scoping Report, although it is not immediately clear whether this would take place prior to or post any DCO consent. The ES should be clear on the range of burial depths that have been considered as part of the assessment(s). Where reliance is placed on a subsequent risk assessment as mitigation, the ES should also explain the effectiveness and degree of confidence that can be placed on this measure.	General	Chapter 4 of this PEIR describes the target burial depth, which will be dependent on the cable burial assessment to be carried out when the cable route is finalised. This will be undertaken post-consent and will be secured through Deemed Marine Licence (DML) conditions.
2.3.5	The Scoping Report does not explain whether High Voltage Alternating Current (HVAC) or Direct Current (HVDC) technologies are proposed, and the ES should describe the technology proposed or options sought in this regard. The Scoping Report also explains that array cables will be 33kV or 66kV but not the circumstances in which either 33kV or 66kV options would be chosen, or whether it might be a combination of both. The ES	General	 Chapter 4 describes the technology proposed and states that the 33kV or 66kV option will be chosen based on the wind turbine generator (WTG) model selected. Chapter 3: Alternatives (Section 3.5) describes the selection process between HVAC and HVDC.

ID	PINS comments	Aspect	How this has been addressed in this PEIR
	should describe these options, any differences in the physical infrastructure requirements and provide an assessment of environmental effects that may result between one or the other (or combined) option		
2.3.6	The Inspectorate understands that preliminary engineering investigations indicate "several" design options for the wind turbine foundations could be considered including monopiles and jackets, and that "other solutions such as suction buckets may be used". The ES should include a full and detailed description of all the foundation options for which development consent is being sought, including maximum diameter of piles should they be used. The Inspectorate makes further comments on flexibility in design in the following paragraphs	General	Chapter 4 of this PEIR (Section 4.3) describes all options under consideration for the WTG foundations and their maximum assessment assumptions.
2.3.7	The Scoping Report identifies the potential need for seabed preparation for foundations and inter array cabling, which may include boulder and/or sandwave clearance. Any requisite seabed preparation for the export cable route should also be described and any resultant likely significant effects assessed within the ES. Should seabed preparation involve dredging, the ES should identify the quantities of dredged material and identify the likely location for disposal. The Applicant's attention is drawn to the scoping consultation response of the Marine Management Organisation (MMO) relating	General	Chapter 4 of this PEIR describes the seabed preparation activities for foundations and inter- array cabling. Site characterisation of new or existing disposal sites will undertaken in support of the DCO Application, and will identify any requirements for a disposal site, in line with the Marine Management Organisation (MMO) scoping consultation response.

ID	PINS comments	Aspect	How this has been addressed in this PEIR
	information required as part of the ES in supporting characterisation of new or existing disposal sites if they are to be included as part of the Proposed Development.		
2.3.8	The ES should identify the worst-case footprint of seabed disturbance that would arise from all offshore construction activities, for example seabed clearance/preparation, and vessel jack up and anchoring. The maximum footprints of all permanent components should also be identified.	General	Chapter 4 (Section 4.3) of this PEIR identifies the worst-case footprint of seabed disturbance that would arise from all offshore construction activities.
2.3.9	The Scoping Report states that the construction of the landfall is "anticipated" to be via a trenchless technique "such as" HDD. The Inspectorate notes that commitment C-4 of Scoping Report Appendix A states that a HDD technique "will" be used at the landfall location. No other trenchless or trenched techniques are presented. The ES should describe and assess the options considered in this regard and the assessment of alternatives should explain the reasons for the selected option(s).	General	 Chapter 3 of this PEIR provides a description and assessment of the techniques considered for landfall. The reasons for the selected landfall technique are provided in paragraphs 3.5.13 to 3.5.17. Chapter 4 of this PEIR describes the construction of the landfall and techniques to be adopted.
2.3.10	Onshore Paragraph 2.3.38 of the Scoping Report explains that, in addition to buried cabling, onshore cable installation methods such as HDD will be also be used as required to avoid or minimise potential effects where constraints are identified, including environmentally sensitive water	General	Appendix 4.2: Crossings schedule, Volume 4 identifies the locations and types of all such crossings, and is cross-referenced in the PEIR where appropriate. Chapter 4 of this PEIR identifies the locations and types of all trenchless crossings. Where reliance is placed in the PEIR on the use of a specific method as mitigation, the

ID	PINS comments	Aspect	How this has been addressed in this PEIR
	course crossings, major roadways and railways. The ES should identify the locations and type of all such crossings. Where reliance is placed in the ES on the use of a specific method as mitigation, the Applicant should ensure that such commitments are appropriately defined and secured. The Inspectorate notes that commitment C – 18 of the Scoping Report Appendix A refers to a "Crossing Schedule" being produced, and this should be cross-referenced throughout the aspect chapters where special crossing types are relevant.		PEIR and subsequently the ES will ensure that such commitments are appropriately defined and secured.
2.3.11	Paragraph 2.3.45 of the Scoping Report explains that onshore cable construction may be phased and there is a possibility that the installation of all onshore cables may not occur in a single operation. It is also explained that haul roads, and any construction compounds will be removed, and reinstatement will take place on completion of the installation. The construction programme should be defined in the ES on the basis of a worst case in respect of phasing periods. The ES should identify where new access routes, either temporary or permanent, are required to access the onshore cable corridor and compounds, as well as the duration for which they will be required in light of phasing (eg how long they will need to be retained for in light of cable installation in multiple operations).	General	The construction programme defined in Chapter 4 is based on a worst case in respect of phasing periods. Chapter 4 identifies where new access routes, either temporary or permanent, are required to access the onshore cable corridor and compounds, as well as the duration for which they will be required in light of phasing (e.g. how long they will need to be retained for in light of cable installation in multiple operations).

ID	PINS comments	Aspect	How this has been addressed in this PEIR
2.3.12	The Scoping Report identifies the need for joint bays and link boxes "at regular intervals along the route" to enable the cable installation and connection process. Regular intervals are defined as 600 – 1000m in C-19, Appendix A of the Scoping Report, although it does define whether their locations will be determined by the time the application is made. The Inspectorate anticipates this may not be the case. If uncertainty persists, the ES should identify a worst-case scenario for the number of jointing pits and link boxes that may be required, and their impact during both construction and operation. Where commitments are made at specific locations to mitigate any potential effects, these should be secured through the Code of Construction Practice (CoCP) (or equivalent) as referred to at paragraph 4.4.27 of the Scoping Report.	General	Joint bays and link boxes are required at regular intervals along the route; this is dependent on substation location, cable route and length, as described in Chapter 4 and will be finalised at the detailed design stage post-consent. Any impacts associated with joint bays and link boxes during construction and operation are identified and assessed in aspect Chapters 6 to 28 . Where commitments are made at specific locations these will be detailed through the Outline Code of Construction Practice (COCP).
2.3.13	For the avoidance of doubt, the Inspectorate understands that the connection of the new substation to the existing National Grid Bolney substation would be via underground cabling (as is implied but not expressly stated at paragraphs 2.3.34 - 2.3.48 of the Scoping Report). The Inspectorate expects the ES to provide greater clarity as to the necessary connection works between the new substation and the Bolney substation (up to 5km away). This is particularly important if / where construction and operation of the connection may be of a different form or type (eg overhead line) to the connection of the new substation to the landfall. In	General	 Chapter 4 outlines how the Proposed Development will connect into the existing National Grid Bolney substation. This will be via underground cabling. Chapter 4 provides greater clarity as to the necessary connection works between the new substation and the existing National Grid Bolney substation.

ID	PINS comments	Aspect	How this has been addressed in this PEIR
	addition, paragraph 2.3.35 states that the existing National Grid Bolney substation would require "underground cables and minor upgrades", and it is unclear whether these works would be part of the Proposed Development (as associated development) or subject to separate consent by National Grid or another party. These matters should be clearly set out in the ES and likely significant effects should be assessed.		
2.3.14	Alternatives The EIA Regulations require that the ES include 'A description of the reasonable alternatives (for example in terms of development design, technology, location, size and scale) studied by the developer, which are relevant to the proposed project and its specific characteristics, and an indication of the main reasons for selecting the chosen option, including a comparison of the environmental effects'.	General	Chapter 3 provides a description of the reasonable alternatives considered by RED.
2.3.15	The Inspectorate acknowledges section 2.4 of the Applicant's Scoping Report setting out the consideration of alternatives to date, and ongoing and future activities that are proposed in this regard to inform the ES.	General	This comment is acknowledged.
2.3.16	Paragraph 3.5.21 confirms that the consideration of alternatives will be presented in the ES in line with the requirements of the EIA Regulations 2017. The	General	Chapter 3 provides a description of the reasonable alternatives considered by RED.

ID	PINS comments	Aspect	How this has been addressed in this PEIR
	Inspectorate would expect this to comprise a discrete section in the ES that provides details of the reasonable alternatives studied across all aspects of the Proposed Development and the reasoning for the selection of the chosen option(s), including a comparison of the environmental effects.		
2.3.17	Flexibility	General	The Rochdale Envelope approach will be applied where appropriate. Where applied a maximum
	The Inspectorate notes the Applicant's desire to incorporate flexibility into their draft DCO (dDCO) and its intention to apply a 'Rochdale Envelope' approach for this purpose. Where the details of the Proposed Development cannot be defined precisely, the Applicant will apply a worst case scenario, as set out in section 2.2 of the Scoping Report. The Inspectorate welcomes the reference to Planning Inspectorate Advice Note nine 'Using the 'Rochdale Envelope' in this regard.		design scenario (MDS) will be adopted. The Planning Inspectorate Advice Note Nine 'Using the Rochdale Envelope' will be adhered to.
2.3.18	The Applicant should make every attempt to narrow the range of options and explain clearly in the ES which elements of the Proposed Development have yet to be finalised and provide the reasons. At the time of application, any Proposed Development parameters should not be so wide-ranging as to represent effectively different developments. The development parameters will need to be clearly defined in the DCO and in the accompanying ES. It is a matter for the Applicant, in preparing an ES, to consider whether it is possible to	General	Chapter 3 and Chapter 4 provide narrative on the narrowing of the range of options and provide clear explanation of the Proposed Development presented in the PEIR. The PEIR is a stage in a process of ongoing refinements to the design, which will continue into the ES.

ID	PINS comments	Aspect	How this has been addressed in this PEIR
	robustly assess a range of impacts resulting from a large number of undecided parameters. The description of the Proposed Development in the ES must not be so wide that it is insufficiently certain to comply with the requirements of Regulation 14 of the EIA Regulations. In this regard, the Inspectorate expects that the component parameters presented in tables 2.2 and 2.3 of the Scoping Report will be refined and further detailed as part of the ES.		
2.3.19	It should be noted that if the Proposed Development materially changes prior to submission of the DCO application, the Applicant may wish to consider requesting a new scoping opinion.	General	This comment is acknowledged.
3	ES APPROACH		
3.1	Introduction		
3.1.1	This section contains the Inspectorate's specific comments on the scope and level of detail of information to be provided in the Applicant's ES. General advice on the presentation of an ES is provided in the Inspectorate's Advice Note Seven 'Environmental Impact Assessment: Process, Preliminary Environmental Information and Environmental Statements'1 and associated appendices.	General	N/A (no response required)

ID	PINS comments	Aspect	How this has been addressed in this PEIR
3.1.2	Aspects/ matters (as defined in Advice Note Seven) are not scoped out unless specifically addressed and justified by the Applicant, and confirmed as being scoped out by the Inspectorate. The ES should be based on the Scoping Opinion in so far as the Proposed Development remains materially the same as the Proposed Development described in the Applicant's Scoping Report.	General	N/A (no response required)
3.1.3	The Inspectorate has set out in this Opinion where it has / has not agreed to scope out certain aspects / matters on the basis of the information available at this time. The Inspectorate is content that the receipt of a Scoping Opinion should not prevent the Applicant from subsequently agreeing with the relevant consultation bodies to scope such aspects / matters out of the ES, where further evidence has been provided to justify this approach. However, in order to demonstrate that the aspects / matters have been appropriately addressed, the ES should explain the reasoning for scoping them out and justify the approach taken.	General	Chapter 5: Approach to the EIA, Section 5.7 sets out the aspects/matters considered in this PEIR. Each aspect chapter (Chapters 6 to 28) sets out activities or impacts scoped out of assessment and the rationale to justify the approach.
3.1.4	The Inspectorate has made effort to ensure that this Scoping Opinion is informed through effective consultation with the relevant consultation bodies. Unfortunately, at this time the Inspectorate is unable to receive hard copy consultation responses, and this may affect a consultation body's ability to engage with the	General	Details of the consultation and engagement undertaken is set out in Chapter 1: Introduction . Chapters 6 to 28 also provide further detail on technical engagement.

ID	PINS comments	Aspect	How this has been addressed in this PEIR
	scoping process. The Inspectorate also appreciates that strict compliance with COVID-19 advice may affect a consultation body's ability to provide their consultation response. The Inspectorate considers that Applicants should make effort to ensure that they engage effectively with consultation bodies and where necessary further develop the scope of the ES to address their concerns and advice. The ES should include information to demonstrate how such further engagement has been undertaken and how it has influenced the scope of the assessments reported in the ES.		
3.1.5	Where relevant, the ES should provide reference to how the delivery of measures proposed to prevent / minimise adverse effects is secured through DCO requirements (or other suitably robust methods) and whether relevant consultation bodies agree on the adequacy of the measures proposed.	General	Chapter 5, Section 5.8 identifies the overarching approach to environmental measures and Appendix 4.1: Commitments register, Volume 4 sets out the commitments being made as part of the Rampion 2 design.
3.2	Relevant National Policy Statements (NPSs)		
3.2.1	Sector-specific NPSs are produced by the relevant Government Departments and set out national policy for NSIPs. They provide the framework within which the Examining Authority (ExA) will make their recommendation to the SoS and include the Government's objectives for the development of NSIPs.	General	The planning policy, legislation and guidance, including sector-specific National Policy Statements, and how they are considered in this PEIR are detailed in Chapter 2: Policy and legislative context .



ID	PINS comments	Aspect	How this has been addressed in this PEIR
	The NPSs may include environmental requirements for NSIPs, which Applicants should address within their ES.		
3.2.2	 The designated NPS(s)identified by the Applicant as being relevant to the Proposed Development in section 3.4 of the Scoping Report are as follows: Overarching NPS For Energy (NPS EN-1); NPS on Renewable Energy Infrastructure (NPS EN-3); NPS for Electricity Networks Infrastructure (NPS EN-5); and NPS for Ports. 	General	Each chapter of this PEIR where relevant includes a table which sets out the PINS Scoping Opinion comments relevant to that chapter and how they have been addressed in this PEIR. Each aspect chapter includes a summary of residual effects table which sets out effects following mitigation (which is all embedded into the Rampion 2 design). Each aspect chapter includes a table of all relevant environmental measures which are embedded into the design and how they will be secured.
3.3	Scope of Assessment		
3.3.1	The Applicant's overarching approach to the assessment is set out in detail in section 4.4 of the Scoping Report, and graphically summarised in Figure 4.1	General	N/A (no response required)
3.3.2	<i>General</i> The Inspectorate recommends that in order to assist the decision-making process, the Applicant uses tables:	General	A standard chapter structure, including tables, has been applied throughout this PEIR to ensure clarity.

ID	PINS comments	Aspect	How this has been addressed in this PEIR
	 to demonstrate how the assessment has taken account of this Opinion; to identify and collate the residual effects after mitigation for each of the aspect chapters, including the relevant interrelationships and cumulative effects; to set out the proposed mitigation and/ or monitoring measures including cross-reference to the means of securing such measures (eg a DCO requirement); to describe any remedial measures that are identified as being necessary following monitoring; and to identify where details are contained in the Habitats Regulations Assessment (HRA report) (where relevant), such as descriptions of European sites and their locations, together with any mitigation or compensation measures, are to be found in the ES. 		Each chapter of the PEIR where relevant includes a table which sets out the PINS Scoping Opinion comments relevant to that chapter and how they have been addressed in this PEIR. Each aspect chapter includes a summary of residual effects table which sets out effects following mitigation (which is all embedded into the Rampion 2 design). Each aspect chapter includes a table of all relevant embedded environmental measures which are embedded into the design and how they will be secured. The Draft Report to Inform Appropriate Assessment (Draft RIAA) is provided alongside the PEIR as a separate document.
3.3.3	Baseline Scenario The ES should include a description of the baseline scenario with and without implementation of the development as far as natural changes from the baseline scenario can be assessed with reasonable	General	The details of the baseline and future baseline scenarios for each aspect are set out in Chapters 6 to 28 .



ID	PINS comments	Aspect	How this has been addressed in this PEIR
	effort on the basis of the availability of environmental information and scientific knowledge.		
3.3.4	The concept of 'future baseline' conditions is introduced in the context of a number of aspect chapters (eg landscape, air quality and ecology). In light of the number of ongoing developments within the vicinity of the Proposed Development application site, and potential evolution of the onshore and offshore environments prior to construction and operation of the Proposed Development, the Applicant should clearly define their overarching approach to the prediction of future baseline conditions against the project programme.	General	The approach to future baseline is presented in Chapter 5, paragraph 5.7.2 and is considered as appropriate within relevant aspect chapters.
3.3.5	Some aspect chapters of the Scoping Report have identified specific receptors, whereas others identify broad categories of receptors only. Specific receptors should be clearly identified within the ES, alongside categorisation of their sensitivity and value. Section 4.4 of the Scoping Report explains the generic approach to defining receptor sensitivity in order to assess the potential impacts upon each receptor. The Inspectorate expects a transparent and reasoned approach to be applied to assigning receptor sensitivity to be defined and applied across the aspect chapters.	General	Specific receptors and aspect approaches to the identification of receptor sensitivity are identified in aspect Chapters 6 to 28 .

ID	PINS comments	Aspect	How this has been addressed in this PEIR
3.3.6	Forecasting Methods or Evidence The ES should contain the timescales upon which the surveys which underpin the technical assessments have been based. For clarity, this information should be provided either in the introductory chapters of the ES (with confirmation that these timescales apply to all chapters), or in each aspect chapter.	General	Timescales upon which the surveys which underpin the technical assessments have been based is provide in each of the aspect chapters (Chapters 6 to 28).
3.3.7	The Inspectorate expects the ES to include a chapter setting out the overarching methodology for the assessment, which clearly distinguishes effects that are 'significant' from 'non-significant' effects. Any departure from that methodology should be described in individual aspect assessment chapters.	General	Chapter 5 sets out the overarching methodology for the assessment, with any necessary variations set out in Chapters 6 to 28 .
3.3.8	The ES should include details of difficulties (for example technical deficiencies or lack of knowledge) encountered compiling the required information and the main uncertainties involved.	General	The details of any technical difficulties or limitations for each aspect are set out in Chapters 6 to 28 . Chapter 5 , Section 5.2 sets out some of the challenges and subsequent measures which have been taken to achieve as much as possible during the EIA programme to date whilst working fully within the restrictions of the pandemic.
3.3.9	The approach to assessing and interpreting significance levels should be consistent across aspect chapters where possible. Where matrices are used in combining	General	Chapter 5 sets out the overarching methodology for the assessment, with any necessary variations set out in Chapters 6 to 28 .

ID	PINS comments	Aspect	How this has been addressed in this PEIR
	magnitude of impact and sensitivity of receptor they too should be consistent in the determining overall significance. The ES should clearly explain where and how professional judgement has been applied in assessing the significance of effects.		
3.3.10	Paragraphs 4.4.10 – 4.4.11 set out that there is a considerable existing evidence base in the form of data from the previous assessment carried out for Rampion 1. This existing evidence base has and will continue to be used "to help inform the scope of the forthcoming environmental assessments and establish the robustness of survey data collected during the COVID-19 period". The Inspectorate generally welcomes the Applicant's intention that the evidence base will be regularly discussed with relevant stakeholders to ensure it remains appropriate. Particular consideration should be given to the methods and the spatial and temporal scope of previous surveys given the time that has elapsed since the Rampion 1 application, particularly in justifying the continued validity and relevance of information to the Proposed Development. The Inspectorate also notes the relative geographical separation between the onshore cable routes for Rampion 1 and the Proposed Development which may also affect the applicability.	General	Section 5.2 of Chapter 5 sets out some of the challenges and subsequent measures which have been taken to achieve as much as possible during the EIA programme to date whilst working fully within the restrictions of the pandemic. The existing evidence base and its application to Rampion 2 has been and will continue to be discussed with stakeholders as part of the Evidence Plan Process (EPP).

ID	PINS comments	Aspect	How this has been addressed in this PEIR
3.3.11	The Inspectorate understands that the maximum height to blade tip of the Proposed Development's WTGs is 325m, whereas those installed as part of Rampion 1 are 140m to blade tip. This is likely to be a key consideration across the aspect chapters of the ES (particularly landscape and visual, cultural heritage and socio- economics), and the ES should be clear as how the magnitudes of effects of the Proposed Development (within the design envelope) account for the relationship with the Rampion 1 project	General	Details of the maximum assessment assumptions are set out in Chapter 4 . The preliminary assessment of effects of the WTGs in relation to landscape and visual impact, cultural heritage and socio-economics are set out in Chapter 19 : Landscape and visual impact , Chapter 26 : Historic environment and Chapter 18 : Socio- economics .
3.3.12	Paragraphs 4.3.10 – 4.3.12 of the Scoping Report explains that an Evidence Plan Process with specialist stakeholders is being progressed in effort to agree the approach and information required to support the assessment of certain environmental aspects relating to HRA matters and "relevant components of the EIA process". This approach to agreeing the finer details of the assessment is welcomed. The Applicant should ensure that any agreements reached during this process are evidenced within the ES	General	Chapter 1 sets out the EPP for Rampion 2. Agreements achieved through the EPP to date is documented in the relevant aspect chapters (Chapters 6 to 28).
3.3.13	As set out in paragraph 2.3.11 of this Scoping Opinion, the ES should be clear as to the potential construction programme options where the installation of all onshore cables may not occur in a single operation. Paragraph 4.4.26 and Figure 2.7 of the Scoping Report states that the construction of the Proposed Development will have	General	An outline construction programme is presented and described in Chapter 4, Section 4.5 .

ID	PINS comments	Aspect	How this has been addressed in this PEIR
	a duration of approximately 5 years although it does not clearly state how this accounts for flexibility in the onshore construction programme and whether this accounts one or more cable installation operations.		
3.3.14	Residues and Emissions The EIA Regulations require an estimate, by type and quantity, of expected residues and emissions. Specific reference should be made to water, air, soil and subsoil pollution, noise, vibration, light, heat, radiation and quantities and types of waste produced during the construction and operation phases, where relevant. This information should be provided in a clear and consistent fashion and may be integrated into the relevant aspect assessments.	Multiple	Information on anticipated emissions from the Proposed Development is provided in Chapter 4 and relevant aspect chapters (Chapters 6 to 28). An Outline Site Waste Management Plan will be prepared and submitted as part of the DCO Application.
3.3.15	Mitigation and monitoring Any mitigation relied upon for the purposes of the assessment should be explained in detail within the ES. The likely efficacy of the mitigation proposed should be explained with reference to residual effects. The ES should also address how any mitigation proposed is secured, with reference to specific DCO requirements or other legally binding agreements.	General	The approach to environmental measures is set out in Chapter 5 , Section 5.8 . Each aspect chapter includes a table of all relevant environmental measures which are embedded into the design and how they will be secured, and reports any residual effects.



ID	PINS comments	Aspect	How this has been addressed in this PEIR
3.3.16	The ES should identify and describe any proposed monitoring of significant adverse effects and how the results of such monitoring would be utilised to inform any necessary remedial actions.	General	Monitoring required of significant adverse effects will be detailed in aspect chapters where relevant.
3.3.17	The ES should clearly demonstrate how the Applicant has had regard to the mitigation hierarchy, for example by giving consideration to the avoidance of key receptors. In this regard, Paragraphs 4.4.19 – 4.4.20 set out the Applicant's proposed approach to setting out avoidance, best practice and design commitments and classifying them against the IEMA 'Guide to Shaping Quality Development' (2015) definitions.	General	Chapter 5 sets out the overarching consideration of environmental measures and how they will be used for Rampion 2, with specific measures and requirements set out in Chapters 6 to 28.
3.3.18	The Inspectorate also notes that Appendix A of the Scoping Report provides a list of certain "commitments" that have already been identified by the project team for the purpose of mitigating potential effects of the Proposed Development. Many of those measures are in the form of management or mitigation plans or other documents. Whilst this approach is generally welcomed and the principles of how the measures listed would likely be beneficial in terms of environmental effects understood, limited detail is provided as to the content of the management and mitigation plans that are listed, and many of the matters included are suffixed by statements such as "where possible" or "as far as practicable". It is therefore difficult for the Inspectorate to	General	The Commitments Register has been updated since Scoping for the PEIR (Appendix 4.1, Volume 4). This register is being updated through the iterative design evolution process and is supported by additional information where appropriate.

ID	PINS comments	Aspect	How this has been addressed in this PEIR
	gain confidence as to the likely efficacy of such plans at this stage. The ES should therefore set out these plans (or the reliance placed on them) in sufficient detail so as to understand the significance of residual effects. This should also include identification of any monitoring and remedial actions (if relevant) in the event that predicted residual effects differ to actual monitored outcomes Further comments on these are made in sections 4 and 5 of this Scoping Opinion as appropriate.		
3.3.19	The ES should also identify and describe any proposed monitoring of significant adverse effects and how the results of such monitoring would be utilised to inform any necessary remedial actions within the framework of the commitments register and other mitigation measures.	General	Monitoring required of significant adverse effects will be detailed in aspect chapters where relevant.
3.3.20	Risks of Major Accidents and/or Disasters The ES should include a description and assessment (where relevant) of the likely significant effects resulting from accidents and disasters applicable to the Proposed Development. The Applicant should make use of appropriate guidance (e.g. that referenced in the Health and Safety Executives (HSE) Annex to Advice Note 11) to better understand the likelihood of an occurrence and the Proposed Development's susceptibility to potential major accidents and hazards. The description and assessment should consider the vulnerability of the	General	Risk of Major Accidents and/or Disasters has been included in this PEIR and is set out in Chapter 28: Major accidents and disasters. Chapter 28 provides a description of the potential major accidents and disasters in Section 28.9 to 28.11 . The approach proposed in Annex G of Advice Note 11 is followed in Section 28.7 .

ID	PINS comments	Aspect	How this has been addressed in this PEIR
	Proposed Development to a potential accident or disaster and also the Proposed Development's potential to cause an accident or disaster. The assessment should specifically assess significant effects resulting from the risks to human health, cultural heritage or the environment. Any measures that will be employed to prevent and control significant effects should be presented in the ES.		The vulnerability of the Proposed Development is described at a high level in Section 28.10 and Section 28.11. There are no significant effects considered likely to arise from major accidents and disasters on the basis of the embedded environmental measures. The description of these potential major accidents is included in Section 28.9 to 28.11. The measures employed to prevent any significant effects are described in Section 28.7.
3.3.21	Relevant information available and obtained through risk assessments pursuant to European Union legislation such as Directive 2012/18/EU of the European Parliament and of the Council or Council Directive 2009/71/Euratom or relevant assessments carried out pursuant to national legislation may be used for this purpose provided that the requirements of this Directive are met. Where appropriate, this description should include measures envisaged to prevent or mitigate the significant adverse effects of such events on the environment and details of the preparedness for and proposed response to such emergencies.	General	Risk of Major Accidents and/or Disasters has been included in this PEIR and is set out in Chapter 28.
3.3.22	Climate and Climate Change	General	Appendix 5.2: Greenhouse gases a preliminary

ID	PINS comments	Aspect	How this has been addressed in this PEIR
	The ES should include a description and assessment (where relevant) of the likely significant effects the Proposed Development has on climate (for example having regard to the nature and magnitude of greenhouse gas emissions) and the vulnerability of the project to climate change. Where relevant, the ES should describe and assess the adaptive capacity that has been incorporated into the design of the Proposed Development. This may include, for example, alternative measures such as changes in the use of materials or construction and design techniques that will be more resilient to risks from climate change		assessment of greenhouse gases in relation to the Proposed Development. Consideration of vulnerability to climate change has been included within relevant chapters of the PEIR and in further documentation supplied for planning purposes. Appendix 5.5: Vulnerability to climate change – policy and baseline, Volume 4 provides a summary of the policy and climatic baseline relevant to the Proposed Development. Where climate change may exacerbate any potential environmental effects, it is incorporated into all relevant chapters within this PEIR, as described in Appendix 5.5, Volume 4. Where environmental measures for climate change resilience have been incorporated into the design of the Proposed Development, these will be described in the Design and Access Statement and the DML at the DCO Application stage.
3.3.23	Transboundary Effects	General	N/A (no response required)
	Schedule 4 Part 5 of the EIA Regulations requires a description of the likely significant transboundary effects to be provided in an ES. The Scoping Report states that the Proposed Development is likely to have significant effects on another European Economic Area (EEA) State.		

ID	PINS comments	Aspect	How this has been addressed in this PEIR
3.3.24	Regulation 32 of the EIA Regulations inter alia requires the Inspectorate to publicise a DCO application on behalf of the SoS if it is of the view that the proposal is likely to have significant effects on the environment of another EEA state, and where relevant, to consult with the EEA state affected. The Inspectorate considers that where Regulation 32 applies, this is likely to have implications for the examination of a DCO application.	General	N/A (no response required)
3.3.25	Appendix B of the Scoping Report explains the Applicant's consideration of transboundary impacts, and concludes that the following aspects could give rise to significant effects on other EEA states and therefore screened in to the Applicant's ES:	General	N/A (no response required)
	 Fish and shellfish ecology; 		
	Marine mammals;		
	Ornithology;		
	Commercial fisheries;		
	 Shipping and navigation; and 		
	• Other marine users.		
3.3.26	On the basis of current information, the Applicant is of the view that the Proposed Development could affect the	General	N/A (no response required)


ID	PINS comments	Aspect	How this has been addressed in this PEIR
	environment in Belgium, France, the Netherlands and Spain.		
3.3.27	The Inspectorate expects that the ES will therefore provide further detail as to the Proposed Development's potential for significant transboundary effects and to confirm which EEA States could be affected	General	The approach to the assessment of transboundary effects is set out in Chapter 5 , Section 5.11 .
3.3.28	A Reference List A reference list detailing the sources used for the descriptions and assessments must be included in the ES.	General	A bibliography or reference list is provided with each chapter of the PEIR.
3.4	Coronavirus (COVID-19) Environmental Information and Data Collection		
3.4.1	The Inspectorate understands government enforced measures in response to COVID-19 may have consequences for an Applicant's ability to obtain relevant environmental information for the purposes of their ES. The Inspectorate understands that conducting specific surveys and obtaining representative data may be difficult in the current circumstance.	General	N/A (no response required)
3.4.2	The Inspectorate has a duty to ensure that the environmental assessments necessary to inform a robust DCO application are supported by relevant and	General	N/A (no response required)

ID	PINS comments	Aspect	How this has been addressed in this PEIR
	up to date information. Working closely with consultation bodies, the Inspectorate will seek to adopt a flexible approach, balancing the requirement for suitable rigour and scientific certainty in assessments with pragmatism in order to support the preparation and determination of applications in a timely fashion.		
3.4.3	Applicants should make effort to agree their approach to the collection and presentation of information with relevant consultation bodies. In turn the Inspectorate expects that consultation bodies will work with Applicants to find suitable approaches and points of reference to allow preparation of applications at this time. The Inspectorate is required to take into account the advice it receives from the consultation bodies and will continue to do so in this regard.	General	N/A (no response required)
3.5	Confidential and Sensitive Information		
3.5.1	In some circumstances it will be appropriate for information to be kept confidential. In particular, this may relate to personal information specifying the names and qualifications of those undertaking the assessments and / or the presence and locations of rare or sensitive species such as badgers, rare birds and plants where disturbance, damage, persecution or commercial	General	N/A (no response required)



ID	PINS comments	Aspect	How this has been addressed in this PEIR
	exploitation may result from publication of the information.		
3.5.2	Where documents are intended to remain confidential the Applicant should provide these as separate electronic documents with their confidential nature clearly indicated in the title and watermarked as such on each page. The information should not be incorporated within other documents that are intended for publication or which the Inspectorate would be required to disclose under the Environmental Information Regulations 2004.	General	No confidential documents are to be provided within this PEIR. Information within the ES which is required to be confidential will be clearly marked and produced as separate documents.
3.5.3	The Inspectorate adheres to the data protection protocols set down by the Information Commissioners Office2 . Please refer to the Inspectorate's National Infrastructure privacy notice3 for further information on how personal data is managed during the Planning Act 2008 process.	General	N/A (no response required)
4	ASPECT BASED SCOPING TABLES - OFFSHORE		
4.1	Coastal processes		
4.1.1	No matters are proposed to be scoped out of the assessment	Coastal processes	This comment is acknowledged.

ID	PINS comments	Aspect	How this has been addressed in this PEIR
4.1.2	The Scoping Report states that the potential impact of the design of the Proposed Development will be assessed "both alone and in conjunction with the built design of the existing Rampion project". It is unclear why the Proposed Development would be assessed alone given that Rampion 1 is now entirely completed. The ES should assess the impacts of the Proposed Development in the context of the relevant baseline environment.	Coastal processes	Potential changes to waves and currents caused by MDS foundations in Rampion 2 are assessed in Chapter 6: Coastal processes, paragraphs 6.10.11 to 6.10.16 against a baseline environmental condition that includes the number, type, dimensions and locations of foundations built in Rampion 1.
4.1.3	The Scoping Report states that the assessment for Rampion 1 was overly conservative and overestimated the number of structures built, yet it asserts that the results of the previous modelling remain valid and can reliably support the ES for the Proposed Development. The ES should ensure that potential changes to the wave and hydrodynamic regime are assessed against an accurately described baseline so as not to underestimate the scale and significance of effects.	Coastal processes	Potential changes to waves caused by MDS foundations in Rampion 2 are assessed in Chapter 6, paragraphs 6.10.11 to 6.10.19 using a new numerical model which includes Rampion 1 in the baseline.
			Potential changes to currents caused by MDS foundations in Rampion 2 are assessed in Chapter 6, paragraphs 6.10.1 to 6.10.10 using a desktop assessment that uses previous conservative modelling results (based on a greater total number of larger foundations) to realistically account for the maximum likely effect of the smaller number, type, dimensions and locations of foundations subsequently built in Rampion 1.

ID	PINS comments	Aspect	How this has been addressed in this PEIR
4.1.4	The Scoping Report does not address impacts on tidal, wave and sediment transport regime or seabed scour during construction and decommissioning of the Proposed Development. The ES should include an assessment of the impacts associated with changes to tidal, wave and sediment transport regime and seabed scour where significant effects are likely to occur. The Applicant should make effort to agree the approach with relevant consultation bodies including NE and the MMO.	Coastal processes	Potential changes to waves, currents and sediment transport, and scour caused by all MDS infrastructure (foundations and cable protection) in Rampion 2 during the operation and maintenance phase is assessed in Chapter 6, paragraphs 6.10.36 to 6.10.42. Potential changes of similar or lesser magnitude and extent caused by any less than all MDS infrastructure during the construction and decommissioning phases are separately assessed in Chapter 6, paragraphs 6.9.80 to 6.9.84, and in paragraphs 6.11.17 to 6.11.22, respectively (using the same MDS as for all infrastructure present). A number of Expert Topic Group (ETG) meetings, described in Chapter 6, paragraph 6.3.5, were held to discuss and agree the approach with relevant consultation bodies including Natural England, Cefas and the Marine Management Organisation.
4.1.5	SSSIs along the coastline (as shown in Figure 5.11.3) have not been listed as sensitive receptors in this regard.The ES should present a full list of designated sites that have the potential to be impacted in terms of coastal processes, including any effects on Climping Beach	Coastal processes	A full list of designated sites that have the potential to be impacted in terms of coastal processes is provided in Chapter 6 , Table 6-4 .

ID	PINS comments	Aspect	How this has been addressed in this PEIR
	SSSI (in relation to changes to landfall morphology) and Beachy Head East MCZ and the Bembridge MCZ.		
4.1.6	The Scoping Report does not address the likelihood of the potential impacts to the sediment transport regime to act cumulatively with other developments and/or infrastructure (including the Aquind interconnector). The ES should include an assessment of the cumulative impacts on the sediment transport regime where significant effects are likely to occur.	Coastal processes	The ES will include an assessment of the cumulative impacts on the sediment transport regime where significant effects are likely to occur. Potential cumulative changes and impacts on the sediment transport regime are assessed in Chapter 6, Section 6.12 including the Aquind interconnector.
4.2	Other marine users		
4.2.1	The Scoping Report demonstrates no spatial overlap between the study area and existing oil and gas infrastructure. The Inspectorate is content for these receptors to be scoped out of the assessment.	Other marine users	This has been noted by RED and on this basis effects on oil and gas infrastructure have been scoped out from this assessment.
4.2.2	The Scoping Report demonstrates no spatial overlap between the study area and munitions disposal areas or MoD practice or exercise areas (PEXAs). The Inspectorate is content for these receptors to be scoped out of the assessment (with the exception of MoD Danger Area D037, see the following paragraph). The Inspectorate notes the comments of the MoD around the potential overlap between the Proposed Development	Other marine users	This has been included within the PEIR baseline (Chapter 7: Other marine users, Section 7.6) and assessed in Section 7.10 onwards. It is important also to note that ongoing consultation will be required (and is planned) with the MoD in order to address this impact (as per Table 7-23).

ID	PINS comments	Aspect	How this has been addressed in this PEIR
	would and Danger Area boundary for D037 which could impact on Military training and the Navy's freedom to exercise within the Area. This matter should be considered as part of the ES where significant effects are likely to occur.		
4.2.3	The Scoping Report demonstrates no spatial overlap between the study area and other offshore energy infrastructure. The Inspectorate is content for these receptors to be scoped out of the assessment.	Other marine users	This has been noted by RED and on this basis effects on other offshore energy infrastructure have been scoped out from this assessment.
4.2.4	The Scoping Report seeks to scope out recreational fishing and seaweed farming from the assessments of temporary increases in suspended sediments and deposition, and alteration in wave energy direction. The Scoping Report provides no information regarding the local seaweed farming industry, and no justification for scoping out effects on recreational fishing. The Inspectorate does not agree to scope this aspect out of the ES based on current information.	Other marine users	Local seaweed farming and recreational fishing information has been included within the PEIR baseline presented in Chapter 7 , Section 7.6 , with relevant receptors taken through to assessment (Section 7.10 onwards).
4.2.5	No justification is given to scope out this matter, however the Inspectorate considers that given their nature significant effects are unlikely to occur to these receptors and they can be scoped out of the assessment. The ES should set out any measures intended to control impacts of this sort through	Other marine users	This has been noted by RED and on this basis effects from the temporary increase in suspended sediments and deposition on recreational boating have been scoped out from this assessment. The proposed methods for construction and installation of infrastructure are considered throughout the PEIR where relevant and

ID	PINS comments	Aspect	How this has been addressed in this PEIR
	provisions in the relevant embedded measures through DCO requirements and other relevant commitments.		appropriate embedded environmental measures are detailed to address significant effects, where relevant.
4.2.6	No justification is given to scope out these impacts however the Inspectorate agrees that significant effects are unlikely to occur due to the nature of the receptors and agrees they can be scoped out of the assessment.	Other marine users	This has been noted by RED and on this basis the impact of increased subsea noise on aggregates, disposal sites, offshore wind, subsea cables and pipelines and recreational boating and sailing have been scoped out from this assessment.
4.2.7	No justification is given to scope out these impacts. The Inspectorate considers that insufficient justification has been provided to scope out the effects on recreational boating and sailing. However, for receptors others than recreational boating and sailing, the Inspectorate agrees that significant effects are unlikely to occur due to the nature and sensitivity of the receptors and they can be scoped out of the assessment.	Other marine users	This has been noted by RED and on this basis the effects from the alteration in wave energy direction and period on aggregates, disposal sites, offshore wind, subsea cables and pipelines and recreational sailing have been scoped out from this assessment. Effects from alteration in wave energy direction and period on diving and water sports are considered further in Chapter 7 , Section 7.10 .
4.2.8	The Scoping Report makes no mention of the aquaculture industry as a potential receptor. This is not addressed in Chapter 5.6 for Commercial Fisheries either. The ES should assess the impacts from the Proposed Development to the aquaculture sector where significant effects are likely to occur.	Other marine users	Aquaculture has been included within this assessments current and future baseline (Chapter 7, Section 7.6), however there is currently no overlap with any proposed aquaculture and therefore no further

ID	PINS comments	Aspect	How this has been addressed in this PEIR
			consideration por assessment has been presented in this PEIR (as per Table 7-7).
4.3	Fish and shellfish ecology		
4.3.1	Although the Inspectorate notes the basis of the evidence provided to support the Applicant's proposed approach (Orpwood et al. (2015) and Armstrong et al. (2015)), the MMO and its technical advisors do not support these findings. In their view, significant uncertainties concerning electromagnetic effects remain. The Inspectorate therefore does not agree that likely significant effects upon fish receptors from operational EMF can be excluded at this stage and this matter should remain scoped into the ES.	Fish and shellfish ecology	The impacts of electromagnetic field (EMF) on sensitive fish and shellfish species have been addressed in Chapter 8: Fish and shellfish ecology, Section 8.10 using available literature to undertake a precautionary assessment.
4.3.2	The Inspectorate agrees that, with the implementation of measures to limit any potential pollution incidents, any potential impacts on fish and shellfish are unlikely to result in significant effects and therefore further assessment is not required. However, the Inspectorate seeks assurances as to the detail of such measures that would be employed and how they would be secured and therefore considers that this detail should be presented within the ES.	Fish and shellfish ecology	This comment is acknowledged. Proposed environmental measures and how they will be secured are set out in Chapter 8 , Section 8.7 .

ID	PINS comments	Aspect	How this has been addressed in this PEIR
4.3.3	The Inspectorate agrees on the basis of the evidence provided and the nature of the Proposed Development that direct and indirect impacts to the seabed resulting in the release of sediment contaminants during construction and decommissioning on fish and shellfish receptors can be scoped out of the ES.	Fish and shellfish ecology	This comment is acknowledged.
4.3.4	Para 5.4.29 states that the proposed development may impact on less mobile species such as whelk, lobster and scallop. This stands at odds with para 5.4.44 which states "Species present that will be subject to disturbance are likely to be mobile and can therefore move away from the construction activities." In the absence of information such as evidence demonstrating clear agreement with relevant consultation bodies, the Inspectorate does not agree to scope this matter out. Accordingly, the ES should include an assessment of this matter where significant effects are likely.	Fish and shellfish ecology	The potential impact on these species is considered in Chapter 8, Section 8.9 to 8.11 .
4.3.5	The Inspectorate is content that there is unlikely to be significant effects from underwater noise during operation and therefore agrees that this matter can be scoped out of the fish and shellfish assessment.	Fish and shellfish ecology	This comment is acknowledged.
4.3.6	The Inspectorate does not consider there is sufficient information in the Scoping Report to support scoping out direct disturbance resulting from maintenance within the array area and the offshore cable corridor during	Fish and shellfish ecology	Potential impacts from direct disturbance resulting from maintenance within the array area

ID	PINS comments	Aspect	How this has been addressed in this PEIR
	operation (for example frequency, duration and nature of such activities). Depending on the nature of the maintenance works and the species present in the area there could be a likely significant effect which should be assessed as part of the ES on the basis of the anticipated maintenance programme.		and the offshore export cable corridor have been considered in Chapter 8 , Section 8.10 .
4.3.7	The Inspectorate is content that there is unlikely to be significant effects from maintenance within the offshore cable corridor during operation and therefore agrees that this matter can be scoped out of the fish and shellfish assessment.	Fish and shellfish ecology	This comment is acknowledged.
4.3.8	The Inspectorate agrees that this matter can be scoped out of the ES on the basis that displacement is only expected to be short term in duration (construction phase) and of limited spatial extent as part of the wider study area. Relevant matters are considered as part of scope of the commercial fisheries section.	Fish and shellfish ecology	This comment is acknowledged.
4.3.9	It is noted that baseline section of the Scoping Report does not clearly identify the conservation status of the fish and shellfish species discussed. The ES should identify, value, and assess impacts on protected species and species of conservation concern, where significant effects are likely.	Fish and shellfish ecology	Species of conservation importance are identified in Chapter 8, Section 8.6 . The potential impact on these species is considered in Chapter 8, Section 8.9 to 8.11 .

ID	PINS comments	Aspect	How this has been addressed in this PEIR
4.3.10	There are locally important populations of undulate ray in the vicinity of the Proposed Development, and as such, impacts to undulate ray nursery grounds should be assessed within the ES.	Fish and shellfish ecology	The potential impact on elasmobranch, including undulate ray is considered in Chapter 8, Section 8.9 to 8.11 .
4.3.11	The Scoping Report does not propose any updated fish or shellfish surveys as there is intent to rely upon data collected for Rampion 1. As Rampion 1 was completed in 2018, it is considered that the fish and shellfish numbers or species may have changed during this time, and potentially as a direct result of the operation of Rampion 1. The Inspectorate does not specifically agree it is appropriate that no additional data collection is required based on the information presented in the Scoping Report. The Inspectorate considers the need for fish and shellfish surveys to be updated should be specifically considered as part of the Evidence Plan Process and reported in the ES. The ES should then justify the validity of the evidence base in informing a robust assessment of significant effects.	Fish and shellfish ecology	Datasets used to inform the fish and shellfish ecology PEIR chapter are provided in Chapter 8 , Section 8.5 . As part of the EPP, it was agreed with the Fish and Shellfish ETG that adequate information had been provided for the baseline characterisation and, with the exception of black seabream, further fish and shellfish surveys were not considered necessary for this assessment. Site specific geophysical surveys were conducted across the entire PEIR Assessment Boundary, which allows consideration of the likely distribution of black seabream nests, and nesting habitat potential outside the Kingmere Marine Conservation Zone (MCZ) based on seabed characteristics (Section 8.6, paragraph 8.6.77 to 8.6.79). The site-specific surveys complement long term black seabream nest distribution data collected within the export cable corridor and nearfield Zone of Influence (ZOI) (to inform licensing decisions for the aggregate industry), black seabream catch and release data, and regional geological data, the composite of which

ID	PINS comments	Aspect	How this has been addressed in this PEIR
			is described in Chapter 8 and completes a comprehensive baseline characterisation fit for the purposes of EIA.
4.4	Benthic subtidal and intertidal ecology		
4.4.1	The Inspectorate agrees that, with the implementation of measures to limit any potential pollution incidents, any potential impacts on benthic subtidal and intertidal ecology are unlikely to result in significant effects and therefore further assessment is not required. However, the Inspectorate seeks assurances as to the detail of such measures that would be employed and how they would be secured and therefore considers that this detail should be described within the ES.	Benthic subtidal and intertidal ecology	The likelihood of an incident will be reduced by implementation of an Outline Project Environmental Monitoring and Management Plan (PEMMP) and Outline Marine Pollution Contingency Plan (MPCP); details of which are presented in Chapter 9: Benthic, subtidal and intertidal, Section 9.7 and Table 9-14. The impacts of accidental pollution events have also been addressed within the assessment Chapter 9, Section 9.9 to 9.11, using available literature to undertake a precautionary assessment.
4.4.2	Although the Inspectorate notes the basis of the evidence provided to support the Applicant's proposed approach (Orpwood et al. (2015) and Armstrong et al. (2015)), the MMO and its technical advisors do not support these findings. The Inspectorate is of the view that uncertainties concerning operation effects of electromagnetic effects remain. The Inspectorate therefore does not agree that likely significant effects upon fish receptors from operational EMF can be	Benthic subtidal and intertidal ecology	The impacts of EMF on sensitive benthic subtidal ecology receptors have been addressed in Chapter 9, Section 9.10 using available literature to undertake a precautionary assessment.



ID	PINS comments	Aspect	How this has been addressed in this PEIR
	excluded at this stage and this matter should remain scoped in to the ES.		
4.4.3	The Scoping Report provides limited evidence to support the request and nothing to demonstrate agreement with relevant consultation bodies. The Inspectorate is not in a position to agree to scope these matters from the assessment. Accordingly, the ES should include an assessment of these matters where significant effects are likely to occur.	Benthic subtidal and intertidal ecology	The impacts of noise pollution during construction related activities have been addressed within the assessment in Chapter 9, Section 9.9 , using available literature to undertake a precautionary assessment.
4.4.4	Table 5.5.2 identifies designated sites and their features which have been screened in for assessment and these include European and nationally designated sites. The ES should ensure that impacts on protected habitats and species (including, but not limited to, those protected under the Habitats Directive, Wildlife and Countryside Act 1981, NERC Act s41 habitats and species of principal importance), together with local Biodiversity Action Plan (LBAP) habitats and species and other habitats/species of conservation concern are assessed where significant effects are likely.	Benthic subtidal and intertidal ecology	Impacts on protected habitats and species, together with Local Biodiversity Action Plan (BAP) habitats and species and other habitats/species of conservation concern have been assessed within Chapter 9, Section 9.9 , using available literature to undertake a precautionary assessment. Furthermore, a nature conservation assessment is presented in Chapter 14: Nature conservation .
4.4.5	It is not yet confirmed which method of cable protection will be adopted for the proposed development, though it is noted that cable burial is the preferred option. The ES should explain the types of cable protection which could	Benthic subtidal and intertidal ecology	The exact form of cable protection to be used will depend upon local ground conditions, hydrodynamic regime/processes, and the selected cable protection contractor. However,

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	be used, and the associated impacts upon benthic subtidal and intertidal ecology.		the final choice will include one or more of the following:
			1. concrete 'mattresses';
			2. rock placement;
			 geotextile bags filled with stone, rock or gravel;
			 polyethylene or steel pipe half shells, or sheathes; and
			bags of grout, concrete, or another substance that cures hard over time.
			This is described in Chapter 4, Section 4.3).
			The impacts of introduced artificial substrates have been addressed in Chapter 9, Section 9.10 using available literature and a worst-case scenario to undertake a precautionary assessment.
4.4.6	It is understood that of the eleven sites sampled, four supported levels of contaminants in excess of Action Level 1 for Arsenic and Chromium. The ES should explain the significance of this finding, and the risk posed from any other contaminants found in the context of characterising the whole survey area.	Benthic subtidal and intertidal ecology	The impacts of sediment contamination have been addressed within the assessment Section 9.9 to Section 9.11 , using available literature to undertake a precautionary assessment.

ID	PINS comments	Aspect	How this has been addressed in this PEIR
4.4.7	The ES should include an assessment of the potential for the spread of non-indigenous species via the colonisation of hard substrates and for the Proposed Development to be used to reach the designated hard habitats in the adjacent Kingmere MCZ.	Benthic subtidal and intertidal ecology	The impacts of Marine Invasive Non-Native Species (INNS) have been addressed within the assessment Chapter 9 , Section 9.9 to Section 9.11 , using available literature to undertake a precautionary assessment.
4.5	Commercial fisheries		
4.5.1	The Scoping Report proposes to scope this matter out of the ES on the basis that the impact will be localised and not significant due to the implementation of the mitigation measure to give adequate notification. The Inspectorate agrees that this matter can be scoped out of the impact assessment having regard to the likely magnitude and on the basis that significant effects are unlikely to occur.	Commercial fisheries	Whilst the Scoping Opinion agreed with the proposed scoping out of the potential impact, subsequent consultation has indicated that some stakeholders are concerned about the effects of Rampion 2 on steaming times to alternate fishing grounds. RED acknowledge that this potential impact merits more detailed assessment; impact assessment outcomes are therefore presented in Chapter 10: Commercial fisheries, Sections 10.9 to 10.11 .
4.6	Marine mammals		
4.6.1	The Inspectorate agrees with the rationale and technical comments of the MMO in paragraphs 3.9.5 - 3.9.12 of their response the scoping consultation regarding the need for assessment of TTS (also supported by Natural England). The Inspectorate is of the view that were TTS to be excluded from underwater noise assessments, the risk of cognitive impairment (TTS) will not be reflected in	Marine mammals	Consideration of the potential for Temporary Threshold Shift (TTS) effects on marine mammals has been included within Chapter 11: Marine mammals, Sections 11.9 to 11.12 as appropriate.

ID	PINS comments	Aspect	How this has been addressed in this PEIR
	the overall assessment of risk to marine mammals, despite evidence in literature to suggest the potential for significant harm to individuals. The ES should therefore assess impacts to TTS from the Proposed Development across all marine mammal species scoped into the assessment where significant effects are likely to occur.		
4.6.2	The Scoping Report seeks to scope out noise from these activities on the basis that noise impacts will be "low in terms of intensity and duration, with a very localised risk", and that that risk is effectively contained within the assessment of 'vessel disturbance' activity (and ZOI defined in that respect). Without further reference to durations and methodologies of such activities in relation to vessel disturbance, and empirical evidence of the magnitudes of noise impacts from these activities when compared to vessel noise, the Inspectorate does not agree that they can be scoped out on the basis of the information provided. The Inspectorate also considers that there is the potential that noise generated from these activities could combine with vessel noise resulting in an overall larger impact and potentially more significant effect on marine mammals.	Marine mammals	The potential effects arising from underwater noise from these other, non-piling, sound sources have been assessed within Chapter 11, Sections 11.9 to 11.12.
4.6.3	The Inspectorate is content that the potential for reduction in prey availability to result in a significant effect on marine mammals during operation can be	Marine mammals	The potential for indirect effects to marine mammals due to potential changes in prey

ID	PINS comments	Aspect	How this has been addressed in this PEIR
	scoped out of further assessment. The Inspectorate does not agree that such a conclusion is supported by the information available at this stage in respect of construction phase impacts. The Scoping Report states that there would be no significant direct effects on marine mammal prey species during construction (see the Benthic Ecology (5.5) and Fish and Shellfish Ecology (5.4) sections of the Scoping Report). The Inspectorate does not agree that significant indirect effects on marine mammals from loss of prey can be excluded at this stage.		availability during construction has been considered within Chapter 11, Section 11.9.
4.6.4	The Applicant seeks to scope out the risks to marine mammals of accidental pollution occurring during construction, operation & maintenance or decommissioning of the Proposed Development the on the basis that a Marine Pollution Contingency Plan (MPCP) and emergency response plans to will be implemented in the unlikely event that any such incident occurs. The Inspectorate agrees that, with the implementation of such measures, any potential impacts on marine mammals are unlikely to result in significant effects and therefore further assessment is not required. However, the Inspectorate considers that the detail of such measures, including how they would be employed and be secured should be presented within the ES. The ES should include draft versions (with sufficient detail) of any plans containing such measures.	Marine mammals	The implementation of a MPCP and emergency response plans has been included as embedded environmental measures for the Proposed Development and have been detailed in Chapter 11, Table 11-11 . The MPCP will also be detailed in the ES as requested by the Inspectorate and therefore accidental pollution remains scoped out at this stage of assessment.

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4.6.5	The Scoping Report seeks to scope impacts of the construction phase resulting in disturbance at a seal haul out sites. The baseline information shows that there is approximately 25-30km between the Proposed Development and the harbour haul out sites. The Inspectorate does not consider that sufficient evidence has been provided to support the contention that significant effects on haul out sites can be ruled out due to the separation distance. As set out in item 4.6.13 below, the spatial extent of the study areas for marine mammals are yet to be fully defined by the Applicant therefore the Inspectorate considers it is premature to agree to scope out such effects from further assessment at this stage. The ES should include this assessment where significant effects are likely to occur.	Marine mammals	Consideration of the potential for impacts to seal haul out sites during the construction phase is presented within Chapter 11, Section 11.9.
4.6.6	The Inspectorate agrees that significant effects on marine mammals due to direct effects of EMF are unlikely during operation of the Proposed Development and agrees that this matter can be scoped out of further assessment. However, the Inspectorate notes that indirect effects from changes to prey availability from EMF (in terms of fish and benthic ecology) during operation will be considered.	Marine mammals	The potential for indirect effects to marine mammals from changes in prey availability due to EMF during operation is presented in Chapter 11, Section 11.10 .
4.6.7	The ZoI for assessment of effects on marine mammals are stated as to be defined "once project specific underwater noise modelling has been completed". The	Marine mammals	A baseline characterisation has been presented in Chapter 11, Section 11.6 , with full details presented in Appendix 11.1: Marine mammals

ID	PINS comments	Aspect	How this has been addressed in this PEIR
	Inspectorate considers that different cetacean species may require different Zol's and study areas to be defined and notes that species have different Management Units. The ES should describe the approach to defining Zol and study area across all species with reference to the outcomes of the evidence plan process. The relevant species for consideration in the context of the Proposed Development are harbour porpoise, bottlenose dolphin, white-beaked dolphin, common dolphin and minke whale, as informed by previous studies and experience from Rampion 1. As per the comments raised in sections 2 and 3 of the Scoping Report, reliance on an evidence base from Rampion 1 will need to be explained and evidenced as to how it remains temporally and spatially applicable.		quantitative underwater noise impact assessment, Volume 4. These characterisations present detail on the management units and the data sources and populations used for assessment purposes. A combination of both historic data sources (i.e. Rampion 1) plus contemporary data sources, including site specific surveys, has been used to enable a robust assessment. A discussion is presented in Appendix 11.1, Volume 4 regarding the densities of the various species as recorded from numerous extensive data sources and includes a justification for the exclusion of white-beaked dolphin from the assessment.
4.6.8	Where the "constantly expanding" marine mammal evidence base is used to provide new or updated baseline data than is referred to in the Applicant's Scoping Report and this Opinion, these should be set out clearly in the ES including reference to agreement as part of the evidence plan process.	Marine mammals	A baseline characterisation has been presented in Chapter 11, Section 11.6 , with full details presented in Appendix 11.1, Volume 4 , including details of discussions through the EPP.
4.6.9	Paragraph 5.7.22 omits any reference to seabed preparation works that may be required as set out in section 2 of the Scoping Report. The ES should	Marine mammals	Potential effects arising from seabed preparation works have been assessed as regards underwater noise and impacts to prey availability within Chapter 11, Section 11.9.



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	consider the potential effects of such works on marine mammals.		
4.6.10	The Applicant's proposed assessment of cumulative effects on marine mammals does not make specific reference to the study area(s) (which is still to be defined) for each species. Paragraphs 5.7.36 – 5.7.38 explain that the study area for cumulative effects remains "to be defined through evidence of potential connectivity". There is no specific reference to spatial and temporal overlap between construction of the Proposed Development and the Aquind interconnector and the operation and maintenance activities associated with Rampion 1. These matters should be assessed in the ES where significant effects are likely.	Marine mammals	Consideration of cumulative effects is presented within Chapter 11 , Section 11.12 , with inclusion of all relevant projects informed based on the study areas (as detailed in Section 11.6).
4.7	Offshore ornithology		
4.7.1	The Inspectorate is content that there is unlikely to be significant effects from maintenance of the offshore export cable during operation and therefore agrees that this matter can be scoped out of the assessment.	Offshore ornithology	This comment is acknowledged.
4.7.2	The Inspectorate is content that there is unlikely to be significant effects from maintenance of the intertidal export cable during operation and therefore agrees that this matter can be scoped out of the assessment.	Offshore ornithology	This comment is acknowledged.

ID	PINS comments	Aspect	How this has been addressed in this PEIR
4.7.3	The Scoping Report provides limited information and no evidence of agreement with relevant consultation bodies to scope this matter out of the ES. The Inspectorate does not agree to scope these matters from the assessment. Accordingly, the ES should include an assessment of these matters where significant effects are likely to occur.	Offshore ornithology	Barrier effect: Array –The presence of the array area could create a barrier to movements of breeding seabirds during foraging trips or to migratory movements during operation. An assessment of the potential impact from barrier effects during operation is included in Chapter 12: Offshore and intertidal ornithology, paragraph 12.13.166.
4.7.4	The study area for offshore ornithology is described as being the Proposed Development array survey area with a 4km buffer, the export cable corridor and the cable landfall area. The Inspectorate considers that the study area should be extended to take into consideration potential impacts on birds species which may use the area for foraging and not just on migration as suggested in para 5.8.7. It is recommended that effort should be made to agree the scope of the study area with relevant consultation bodies.	Offshore ornithology	The study area is defined in Chapter 12 , paragraph 12.4.3 . This assessment includes all bird species which may use the study area at any point, including using the study area for foraging, moulting, loafing, or whilst migrating. The study area has been agreed with stakeholders through the EPP.
4.7.5	The Inspectorate notes that aerial digital surveys are being undertaken to provide information regarding ornithological species in the study area. Details should be provided of the methodology used to undertake the surveys. This information should be clearly presented in the ES. The Applicant should make effort to agree the scope and adequacy of these surveys with relevant consultation bodies. Paragraph 5.8.5 and figures 5.8.3 –	Offshore ornithology	As a result of changes to the Proposed Development between Scoping and PEIR, the offshore part of the PEIR Assessment Boundary plus a 4km buffer are fully within the area covered by the digital aerial surveys. Full details of the changes made to the assessment boundary are presented in Chapter 12 , paragraph 12.4.4 . Justification that the Study

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	5.8.6 show that a small part of the eastern area of the offshore study area has not been covered by digital survey. The ES should justify the extent of survey areas in supporting a robust assessment of significant effects on displacement of bird populations.		Area is suitable to support a robust assessment of significant effects of displacement is presented in Sections 12.12 and 12.13 .
			The PEIR Assessment Boundary has been refined down to fit within the survey area of collection including an appropriate buffer for PEIR and ES assessment (Chapter 3, Section 3.3).
4.7.6	The exact method for CRM has not yet been defined. The ES and/or accompanying technical appendices should provide detailed information regarding the methodology undertaken for the CRM and analysis of the data used to inform the impact assessment, together with figures where appropriate.	Offshore ornithology	Detailed information regarding the collision risk modelling (CRM) methodology and additional supporting information is provided in Appendix 12.3: Offshore and intertidal ornithology collision risk modelling, Volume 4 . RED is seeking agreement, through discussion at the ETGs with the relevant stakeholders that the approach to CRM is suitable.
4.7.7	The ES should contain details of other developments assessed in the cumulative effects assessment. Given the far ranging nature of breeding and migratory birds, justification should be provided as to the spatial and temporal extent of the other projects considered.	Offshore ornithology	Cumulative effects are assessed in Chapter 12 , Section 12.15 . Full justification is given for the spatial and temporal extent of the other developments considered.
4.8	Underwater noise		



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4.8.1	n/a	Underwater noise	No comment provided to address.
4.8.2	The Inspectorate welcomes the consideration of underwater noise and vibration during the construction, operation and decommissioning phases of the Proposed Development. Effort should be made to agree the methodology with the relevant consultation bodies and agreements should be clearly outlined within the ES. Early engagement with the MMO is encouraged to ensure that any noise modelling utilising site-specific physical parameters and project specific detail is appropriate and fit for purpose.	Underwater noise	A description of the early engagement undertaken with various stakeholders can be found throughout Chapter 11 , Section 11.3 . While 'Early Engagement' was not undertaken, the MMO were present during the "Offshore Ornithology, Marine Mammals and Habitats Regulations Assessment (HRA) (offshore only)" ETG on the 18 September 2020 (see EPP section below). Alongside the MMO, Cefas, Natural England, The Sussex Wildlife Trust (TSWT), The Wildlife Trusts (TWT), and Whale and Dolphin Conservation (WDC) were also invited to participate in the EPP as described below.
4.8.3	The baseline environment should be established beyond simply referring to the relevant aspect chapters where this information is presented. Potential noise and vibration impacts should be assessed against that baseline, noting that the underwater noise assessment draws entirely upon baseline data in other aspect chapters. The methods and noise propagation modelling software should be detailed within the ES; along with the project specific detail that it utilises with reference to spatial, temporal and physical design envelopes.	Underwater noise	The underwater noise technical modelling report (Appendix 11.3: Underwater noise assessment technical report, Volume 4) presents full details of the modelling methodology including establishment of the worst-case assumptions. The results of the modelling have been incorporated within the relevant aspect chapters to inform the assessments of impacts from underwater noise on the relevant aspects

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			with due consideration of the baseline environment.
4.8.4	The Inspectorate welcomes the collaboration with the other relevant aspects as set out in paragraph 5.9.1 of the Scoping Report. The ES should include appropriate cross-references between aspect chapters and avoid duplication and contradictory information.	Underwater noise	Cross-referencing has been undertaken to relevant documents where appropriate to minimise duplication of information between chapters.
4.8.5	The possible modelling of noise from UXO is not referenced in this section. Elsewhere in the Scoping Report there is reference to UXO surveys yet to be conducted and that UXO removal may be required. The ES should therefore consider the potential for UXO underwater noise impacts of the Proposed Development where significant effects are likely to occur (including cumulative effects with other underwater noise producing activities).	Underwater noise	Underwater noise impacts are considered across the relevant marine ecology aspect chapters including Chapter 11 , Chapter 8 and Chapter 9 . The predicted impact ranges from unexploded ordnance (UXO) clearance for a range of sizes has been modelled and is presented within (Appendix 11.3 , Volume 4). The potential effects arising from underwater noise from a range of sources including UXO have been assessed within Sections 11.9 to 11.12 .
4.9	Shipping and navigation		
n/a	No matters are proposed to be scoped out of the assessment	Shipping and navigation	This comment is acknowledged.

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4.9.1	The Applicant explains that the study area "will be reviewed and potentially amended in response to such matters as refinement of the offshore components, the identification of additional impact pathways and in response where appropriate to feedback from consultation". The Inspectorate is unclear as to what refinement of offshore components or identification of additional impact pathways could occur that would lead to amendment of the study area. The ES should clearly set out the study area with reference to the "standard" 10nm buffer that is stated (and it's basis within relevant legislation and guidance).	Shipping and navigation	The shipping and navigation study area used for the Scoping Report has been maintained despite a reduction in the size of the PEIR Assessment Boundary in order to ensure consistency. Consequently, the study area considered in the PEIR is a minimum 10nm buffer of the PEIR Assessment Boundary. The study area is presented in Chapter 13: Shipping and navigation, Section 13.4.
4.9.2	There is a high degree of overlap in the assessment of effects on offshore recreational users as set out in sections 5.3 (other marine users) section 5.10 (shipping and navigation) and section 5.15 (socioeconomics). The Inspectorate expects that these matters will be considered as part of the assessment(s) of inter-related effects as set out in paragraph 4.4.40 of the Scoping Report.	Shipping and navigation	The effect on recreational users has been considered as an inter-related effect. The assessment of inter-related effects is provided in Chapter 13, Section 13.14 . The socio-economic effect of Rampion 2 has been considered in Chapter 18 .
4.9.3	The International Maritime Organization (IMO) Formal Safety Assessment (FSA) guidance will be followed when assessing impacts to shipping and navigation receptors, assessing each impact in terms of frequency and consequence (Table 5.10.1). The ES should clearly set out how the risk assessment approach leads to an	Shipping and navigation	The Revised Guidelines for FSA for Use in the Rule-Making Process (IMO, 2018) have been applied to the preliminary assessment, noting that this differs from the standard assessment methodology being applied for other aspects. The methodology used for the preliminary

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	assessment of significance of effect consistent / compatible with the terminology as set out in Figure 4.1 of the Scoping Report.		assessment is outlined in Chapter 13, Section 13.8 with further detail provided in Section 3 of Appendix 13.1: Navigational risk assessment, Volume 4.
4.9.4	The Inspectorate notes the apparent importance of the "hazard workshop[s]" subsequent to the Scoping Opinion in refining the approach to the assessment. The scope, outcomes and agreements reached during this meeting should be specifically set out in the ES and NRA (eg in the form of technical appendices or other standalone reports).	Shipping and navigation	Points raised at the Hazard Workshop are outlined in Section 13.3 and the hazard log – the main output of the Hazard Workshop – is provided in full in Annex A of Appendix 13.1, Volume 4.
4.9.5	The ES should explain how the assessment has factored in shipping and navigation effects on the nine marine aggregate dredging areas intersecting the study area. It is unclear if such effects are to be considered part of the 'baseline' conditions or whether a future baseline is required accounting for changes in dredging activity,. Such effects may also need to be considered as part of the cumulative effects assessment of combined effects of the Proposed Development and aggregate activity on other receptors. The Inspectorate notes the Applicant's identification of a "significant marine aggregate dredging routewithin the north-west of the study area" in this regard.	Shipping and navigation	The PEIR Assessment Boundary has been refined down to increase the distance between the array area and the Owers and Mixon rocks as well as dredging activity in the area. Consultation with dredging companies will be ongoing and the PEIR assesses any remaining possible impact on other marine users (see Chapter 3 , Section 3.3). Consultation with marine aggregate dredging stakeholders has been undertaken and marine aggregate dredgers have been considered as a receptor in the impact assessment, both for the assessment of Rampion 2 in isolation and as part of the Cumulative Effect Assessment (CEA). The preliminary assessment (which includes consideration of marine aggregate dredgers) is

ID	PINS comments	Aspect	How this has been addressed in this PEIR
			provided in Chapter 13, Section 13.9, Section 13.10 and Section 13.11.
4.10	Nature conservation		
4.10.1	Direct impacts to nature conservation features of designated sites are scoped out of further assessment on the basis that there is no physical overlap of between the Proposed Development and designated site (other than Climping Beach SSSI, direct effects to which are scoped in to the assessment). The Inspectorate agrees with the Applicant that direct effects can be excluded on this basis and considers that indirect effects will be assessed appropriately as set out in table 5.11.5 of the Scoping Report (subject to relevant comments in this Opinion).	Nature conservation	The approach to scoping nature conservation designations was developed through further consultation with stakeholders following issue of the Scoping Opinion. Chapter 14, Table 14-5 sets out consultation on the Nature Conservation Method Statement, and Section 14.4 details the scope of the Nature Conservation preliminary assessment. Note, the export cable at the landfall will be installed using a Horizontal Directional Drilling Technique (HDD). This embedded measure (Table 14-12) results in avoidance of any direct disturbance to the Climping Beach SSSI. Therefore, direct disturbance on Climping Beach Site of Special Scientific Interest (SSSI) has not been considered within the Nature Conservation chapter.
4.10.2	The Inspectorate recognises that there will be a high degree of overlap between the proposed assessment of 'Nature conservation' as a standalone aspect chapter	Nature conservation	The Nature Conservation baseline describes the relevant designations to the preliminary assessment. Baseline information (Chapter 14,

ID	PINS comments	Aspect	How this has been addressed in this PEIR
	 and several other aspects as listed in paragraph 5.11.2. This is also demonstrated by Table 5.11.5 of the Scoping Report (likely significant nature conservation effects) where it is explained that all baseline requirements will be covered by the individual aspect assessments (ie no additional data is required for the nature conservation aspect chapter). The Inspectorate also notes the interface with the assessment of terrestrial ecology (section 6.6 of the Scoping Report, which is not listed in paragraph 5.11.2) as well as standalone HRA and WFD assessments that are proposed. The Applicant should ensure the scope and content of the assessment is clearly framed with this in mind in order to avoid an overly complex assessment across a number of aspect chapters. Cross referencing should be used in order to avoid duplication and ease presentation of material for stakeholders. 		Section 14.6) and assessment (Section 14.9 to 14.13) on specific qualifying features is summarised from and cross-referenced to the relevant technical chapter where appropriate. The scope of the Nature Conservation Assessment is detailed within Chapter 14, Section 14.4. No impact pathways were identified between qualifying features of terrestrial designated sites and offshore activities within the offshore Nature Conservation Study Area. Chapter 23: Terrestrial ecology and nature conservation considers the impact pathways from onshore components on receptors that may have connectivity with offshore or coastal designated sites where appropriate. Cross-referencing has been used throughout Sections 14.9 - 14.12 where relevant to minimise duplication.
4.10.3	The Scoping Report identifies the spatial relationship of the Proposed Development to Marine Conservations Zones (MCZs) in Table 5.11.3 and Figure 5.11.3. Although that the requirements for standalone MCZ assessment(s) under the Marine and Coastal Access Act (MCAA) are sperate to the EIA process, the Inspectorate expects a coordinated approach to the	Nature conservation	The scope of the Nature Conservation Assessment is detailed within Chapter 14 , Section 14.4 . The assessment therefore considers the qualifying features of relevant MCZ within the context of the EIA. Appendix 14.1: MCZ Assessment, Volume 4 presents an assessment of MCZs in the context of the Marine and Coastal Access Act (MCAA).

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ID	PINS comments	Aspect	How this has been addressed in this PEIR
	assessment of effects on MCZs in the ES and any separate assessment under the MCAA.		
4.10.4	Potential effects Marine Local Wildlife Sites (LWS) should be considered and assessed as part of this aspect chapter where significant effects could occur. This should include the Waldrons Marine LWS, Shelley Rocks Marine LWS, and HMS Northcoates Marine LWS.	Nature conservation	Local wildlife sites have been considered within this assessment. The full scope of the assessment is detailed in Chapter 14, Section 14.4 .
4.10.5	Reference is made to the WFD coastal water body and designated bathing waters, but no further reference is made to the assessment of effects to be reported within the scope of the Nature Conservation ES chapter. The potential for significant effects on this designation should be presented as part of the ES chapter, with appropriate cross reference to other aspect chapters (and standalone WFD reports) as required.	Nature conservation	Changes to water quality were scoped out of the assessment in agreement with stakeholders during consultation on the Nature Conservation Method Statement (See Chapter 14, Table 14- 5). Appendix 27.3 : WFD Assessment, Volume 4 presents an assessment on water quality.
4.10.6	The marine mammal "management unit scale" study area described in the section 5.7 of the Scoping Report identifies the Southern North Sea SAC as being relevant to the Proposed Development. On this basis, the Inspectorate would expect to see the SAC included in the assessment of potential significant effects in the nature conservation assessment chapter of the ES.	Nature conservation	The marine mammal nature conservation study area is presented in Chapter 14, Section 14.4 . The Southern North Sea (SNS) Special Area of Conservation (SAC) has been scoped into the assessment and is considered in Sections 14.9 to 14.12 .

4.11 Civil and military aviation

ID	PINS comments	Aspect	How this has been addressed in this PEIR
4.11.1	The Inspectorate agrees that significant aviation effects from construction and operation of the offshore cabling are unlikely and can be scoped out of further assessment.	Civil and military aviation	Aviation effects from construction and operation of the offshore cabling have been scoped out of the assessment (see also Chapter 15: Civil and military aviation, Table 15-6).
4.11.2	On the basis that WTG rotors will be static during construction and would not interfere with radar systems, the Scoping Report suggests that there is no impact pathway during construction. The Inspectorate agrees that this can be scoped out on this basis and on the basis that the operational assessment effectively encompasses consideration of any significant effects during construction.	Civil and military aviation	Acknowledged. The impact of static WTG rotors on radar systems during construction and decommissioning scoped out of the assessment (see also Chapter 15, Table 15-6).
4.11.3	On the basis that there are no licensed airfields with a surveillance radar within 30km of any part of the WTG array area, the Applicant seeks to scope this matter out of further assessment. Whilst the Applicant is proposing additional consultation with stakeholders as to the scope of the assessment, the Inspectorate does not consider it appropriate to agree to scoping this matter out on the basis of an arbitrary 30km distance at this stage. The Inspectorate does not consider that sufficient justification has been provided to exclude effects beyond 30km (for example with reference to defined consultation zones). The ES should assess this matter where significant effects are likely to occur.	Civil and military aviation	Farnborough Airport, Gatwick Airport and Southampton Airport are included in the assessment. Radar Line of Sight (RLoS) modelling shows that there is no possibility of their radars being affected by Rampion 2 (see also Chapter 15, Table 15-6).

ID	PINS comments	Aspect	How this has been addressed in this PEIR
4.11.4	On the basis that there are no no-radar licensed aerodromes within or close to the relevant 12 and 17km consultation distances set out, the Inspectorate agrees that this matter can be scoped out of further assessment.	Civil and military aviation	Physical presence and operation of the WTGs leading to impacts on no-radar licensed aerodromes has been scoped out of the assessment (see also Chapter 15, Table 15-6).
4.11.5	Given the location of the WTGs at least 12km offshore, the Scoping Report identifies that there will be no effects on light aircraft landing strips, gliding sites, microlight sites or parachute sites. The Inspectorate agrees that significant effects during operation are unlikely and can be scoped out of further assessment on this basis.	Civil and military aviation	Physical presence and operation of the WTGs leading to impacts on other civil aviation activities (excluding Search and Rescue (SAR)) has been scoped out of the assessment (see also Chapter 15, Table 15-6).
4.11.6	The Scoping Report seeks to rely on an Emergency Response and Cooperation Plan (ERCOP) and appropriate lighting, marking and notification, in line with CAA regulations (to be applied and secured for the Proposed Development) to exclude significant effects. In absence of the detail of an ERCOP and the other measures proposed, the Inspectorate cannot rely on their content as justification for scoping this matter out of the ES. The Inspectorate also notes the potential combined effect on SAR of the construction and operation of the Proposed Development and Rampion 1 and this should be assessed within the ES.	Civil and military aviation	Impact on SAR considered as part of the assessment of the various phases of the Proposed Development (see Chapter 15, Sections 15.9 to 15.11).

ID	PINS comments	Aspect	How this has been addressed in this PEIR
4.11.7	Based on the information provided in paragraphs 5.12.31 – 5.12.34, the Scoping Report suggests that it is "evident" that there is sufficient distance from the Proposed Development to rule out significant effects on MoD facilities. Paragraph 5.12.55 also states that there are no air defence radars within a "relevant distance of Rampion 2" although such a distance is not defined. The Inspectorate does not consider sufficient technical and evidence based information has been provided to agree that effects on MoD facilities entirely, not least because the Applicant refers to further consultation with the MoD as part of the scoping process (and potentially beyond). The ES should assess these matters where significant effects are likely to occur.	Civil and military aviation	The nearest air defence radars are at Trimingham, 267km to the north-east, and at Portreath, 329km to the west. Neither of these radars will have RLoS of Rampion 2 WTGs. Further consultation will be initiated with the MoD regarding the overlap of Danger Area D037 with the Rampion 2 PEIR Assessment Boundary (see also Chapter 15, Table 15-12).
4.11.8	On the basis that the nearest Met Office radar systems are located at c. 85km from the Proposed Development (in excess of the 20km safeguarded zone around each), the Inspectorate agrees that significant effects are not likely to occur and that this matter can be scoped out of the ES.	Civil and military aviation	Effects on Met Office radar systems have been scoped out of the assessment (see also Chapter 15, Table 15-6).
4.11.9	The Scoping Report relies on the requirement for aviation lighting (with differentiation between aviation and maritime lighting) to be put in place and secured as part of the design of the Proposed Development to justify scoping out this matter. In absence of the detail of these measures (and the need for further consultation in	Civil and military aviation	Noting the comment, construction, operation and decommissioning effects on civil and military flight operations have all been scoped into the assessment; see Chapter 15 , Sections 15.9 to 15.12 .

ID	PINS comments	Aspect	How this has been addressed in this PEIR
	this regard), the Inspectorate cannot rely on their content as justification for scoping this matter out of the ES at this stage. The Inspectorate also notes the potential combined effect of the construction and operation of the Proposed Development and Rampion 1 and this should be assessed as part of the ES.		The adjacent Rampion 1 offshore wind farm is an existing operational project and is therefore considered as part of the existing baseline. Possible cumulative effects arising from the presence of Rampion 1 are considered in Chapter 15, Section 15.7 and assessed in Sections 15.9, 15.10 and 15.11 .
4.11.10	Figure 5.12.1 does not actually depict the proposed study area, and does not provide a key making it difficult to depict and identify the features set out on the complex basemap (and which are then described listed in the baseline conditions section). The ES should provide a clear definition of the study area (including if / how it varies across the various matters considered in the assessment (ie civil and military aviation receptors). Supporting figures should more clearly identify the location(s) of these receptors.	Civil and military aviation	The updated study area figure (Figure 15.1, Volume 3) clearly identifies the locations of civil and military aviation receptors as detailed in Chapter 15, Section 15.4.
4.11.11	The Applicant explains that "significance criteria for aviation impacts are typically difficult to establish", and that further details of the assessment of significance will be provided in the PEIR and ES. The Inspectorate is therefore not able to make any comments on the proposed approach, but expects that the Applicant would define such criteria so that they are compatible with the approach and terminology as set out in section 4 and figure 4.1 of the Scoping Report.	Civil and military aviation	The significance criteria used for the assessment are discussed in Chapter 15, paragraph 15.8.11 and defined in Table 15-10.

ID	PINS comments	Aspect	How this has been addressed in this PEIR
4.11.12	The Inspectorate refers the Applicant to the comments of NATS Enroute PLC and the potential effects identified by them on radar infrastructure at Pease Pottage and both the "London Area Control Centre" and "London Terminal Control Centre" Air Traffic Control Centres (ATC). The Inspectorate notes that further consultation will be required in order to enable suitable mitigation (paragraph 5.12.37). The ES should set out how the design and / or other measures secured as part of the Proposed Development propose to mitigate assess these effects.	Civil and military aviation	The impact on Pease Pottage has been confirmed by RLoS modelling, see Appendix 15.1: Airspace analysis and radar modelling, Volume 4 . Mitigation options have been explored in Appendix 15.1, Volume 4 and will inform further consultation with NERL (see also Chapter 15, Table 15-12).
4.12	Seascape, landscape and visual		
4.12.1	The Inspectorate agrees that this matter can be scoped out of the seascape, landscape and visual assessment on the basis that these MCA's are likely to experience low levels of change, with limited visibility of offshore elements of the Proposed Development. Significance of effects on MCA08, MCA13 and MCA06 will be assessed (as shown on Figure 5.13.4).	Seascape, landscape and visual	Significance of effects on MCA05, MCA06, MCA07 and MCA08, are assessed in Chapter 16: Seascape, landscape and visual, Section 16.10 . MCA13 'Central English Channel' has also been scoped out of the assessment due to its distance offshore, position at the most distant part of the wind farm array area and baseline influence as a busy shipping channel.
4.12.2	The Inspectorate agrees that this matter can be scoped out of the seascape, landscape and visual assessment on the basis of the justification in paragraphs 5.13.112 –	Seascape, landscape and visual	Effects on these landscape receptors have been scoped out.

ID	PINS comments	Aspect	How this has been addressed in this PEIR
	5.13.116 (there is limited/no visibility of the offshore elements of the Proposed Development)		
4.12.3	The Inspectorate agrees that this matter can be scoped out of the SLVIA in relation to special qualities 2 (A rich variety of wildlife and habitats including rare and internationally important species) and 4 (An environment shaped by centuries of farming and embracing new enterprise). However, in respect of special qualities 5 (Great opportunities for recreational activities and learning experiences) and 6 (Wellconserved historical features	Seascape, landscape and visual	Effects on Special Quality 2 and 4 have been scoped out. Effects on Special Quality 5 are assessed in Chapter 16, Section 16.10 . Effects on Special Quality 6 are assessed in Chapter 25: Historic environment .
	and a rich cultural heritage), the Inspectorate does not consider it is appropriate to scope these out of the SLVIA and these matters should be assessed in the ES		
4.12.4	The Inspectorate is content that there is unlikely to be a significant cumulative seascape, landscape and visual effects of the Proposed Development with other windfarm projects; with the exception of Rampion 1 and therefore agrees that this matter can be scoped out of the seascape, landscape and visual assessment	Seascape, landscape and visual	Cumulative seascape, landscape and visual effects of Rampion 2 with other wind farm projects have been scoped out. Rampion 1 is considered as part of the baseline conditions in Chapter 16, Section 16.6 and impact assessments in Section 16.10 .
4.12.5	The Inspectorate is content that there is unlikely to be significant effects outside of the 50km radius SLVIA study area and therefore agrees that this matter can be	Seascape, landscape and visual	Seascape, landscape and visual effects outside the 50km radius SLVIA study area have been scoped out.


ID	PINS comments	Aspect	How this has been addressed in this PEIR
	scoped out of the seascape, landscape and visual assessment		
4.12.6	The ES should contain assessment of the impact which the Proposed Development may have on dark skies. It would be helpful if a Figure were included to show the study area which is considered for this. Agreement with relevant consultation bodies should be evidenced in the ES.	Seascape, landscape and visual	An assessment of the impact which the Proposed Development may have on dark skies is provided in Appendix 16.5: Preliminary assessment of aviation and navigation lighting visual effects, Volume 4 and summarised in Chapter 16, Section 16.10.
4.12.7	The Scoping Report acknowledges that the Proposed Development would be visible from the Isle of Wight, particularly at those locations which are at higher elevations. Only one viewpoint has been selected for the Isle of Wight. The south east of the Isle of Wight has areas of high ground which overlook the Channel and where views of the Proposed Development could be afforded. Effort should be made to agree the locations of the viewpoints with relevant local planning authorities and other consultation bodies that might be affected to ensure impacts from long reaching views have been assessed at relevant representative viewpoints.	Seascape, landscape and visual	Three viewpoints have been selected on the Isle of Wight in agreement with relevant consultation bodies – Viewpoint 24, 34 and 35.
4.12.8	The ES should also include effects of views from the Isle of Wight Coastal path as a sensitive receptor. This coastal path encircles the island and allows for views across the Proposed Development site.	Seascape, landscape and visual	An assessment of the impact which the Proposed Development may have on the Isle of Wight Coastal path is provided in Chapter 16, Table 16-42 .

ID	PINS comments	Aspect	How this has been addressed in this PEIR
4.13	Marine archaeology		
4.13.1	The impacts proposed to be scoped out in Table 5.14.8 are on the basis of "embedded environmental measures	Marine archaeology	Embedded environmental measure C-57 has been adopted to secure the development of a
4.13.2	to be adopted for the Proposed Development, forming commitments by RWE to avoid all identified		Marine Written Scheme of Archaeological Investigation (WSI) in accordance with the
4.13.3	archaeological receptors of a medium of high archaeological potential". This will be through the establishment of archaeological exclusion zones (AEZs)		part of the PEIR process (Appendix 17.2: Marine Outline Written Scheme of
4.13.4	of an "appropriate size and extent" and 'tertiary' mitigation in the form of archaeological written schemes of investigation (WSI) and project specific reporting protocol for unexpected discoveries. The embedded measures are listed in table 5.14.7 and summarised as follows: • A marine WSI (in accordance with an Outline Marine WSI), including a protocol for archaeological discoveries) • Offshore geophysical surveys (including UXO survey) will be undertaken prior to construction covering 100% of the development area. • Offshore geotechnical surveys will be undertaken prior to construction, including geoarchaeological assessment and analysis of data (inclusive of publication), • Offshore export cable corridor and the array cabling will be routed to avoid any identified archaeological receptors (with buffer zones as to be detailed in the WSI). The Scoping Report does not provide specific detail in respect to these measures but they are acknowledged to constitute recognised methods of control for the impacts described (with reference to relevant guidance in paragraphs		Investigations, Volume 4). The Outline WSI details the Archaeological Exclusion Zones (AEZ) which have been recommended following desk- based studies combined with the assessment of geophysical data to ensure correct location as well as appropriate size and extent of protective area. This is further discussed in Section 5 of the Marine archaeology Technical Report Appendix 17.1: Marine Archaeology Technical Report, Volume 4.
4.13.5			
4.13.6			
4.13.7			
			All embedded environmental measures are presented in Chapter 17: Marine archaeology, Section 17.7 and Table 17-13.
			Regular ETG meetings will present progress on the embedded commitments on which Historic England will have the opportunity to comment and inform the further direction. See Chapter 17, Sections 17.3 and paragraph 17.17.6.

ID	PINS comments	Aspect	How this has been addressed in this PEIR
	5.14.11 - 5.14.12). The Inspectorate is content that if the above measures are adequately secured (with reference to implementation) and presented in sufficient detail then they may be relied upon as means to demonstrate an absence of significant effect in the ES. In this regard, the Inspectorate expects that the "outline" WSI would form part of the DCO application documents and that this document and the ES would provide additional detail to what "appropriate size and extent" of AEZs would comprise and where they would be located. The Applicant should make efforts to agree the detail in relation to these measures with relevant consultation bodies, and the Inspectorate welcomes the Applicants intent in this regard, for example through the evidence plan process.		It is expected that the embedded environmental measures will form DCO requirements or DMLs conditions.
4.13.8	Based on the baseline information presented in tables 5.14.5 and 5.14.6 and the receptor sensitivity criteria, the Inspectorate understands that unmitigated impacts of the Proposed Development could be of high significance. In setting out the proposed mitigation measures as considered above, the Applicant should acknowledge worst case assumptions in respect receptor sensitivity of potentially unidentified archaeological assets including those identified through geophysical survey.	Marine archaeology	Chapter 17, Section 17.7 includes the assessment of maximum adverse scenario for each receptor and establishes the maximum potential adverse impact on potential known and unknown receptors. The criteria for magnitude of impact are included in Table 17-15 where the adverse and beneficial criteria is outlined (Major to Negligible) and the significance of assessment matrix is detailed in Table 17-16. Impacts on receptors as per Table 17-6 are detailed in Sections 17.10 and 17.11.



ID	PINS comments	Aspect	How this has been addressed in this PEIR
			Receptors identified in the baseline assessment and the archaeological assessment of geophysical data (as per C-58 (Table 17-13) are included in the preliminary assessments in Sections 17.10 and 17.11 . and further detailed in Appendix 17.1 , Volume 4 . Potential impact on the receptors is mitigated within commitments C- 57 (Table 17-13) which outlines AEZ's within the WSI document (Appendix 17.2 , Volume 4) and C-60 (Table 17-13) where the avoidance of identified marine heritage receptors is secured. Impact on unidentified and unexpected receptors are mitigated through commitment C-57 (Table 17-13) which includes a reporting protocol for instances where a site or find may be located during offshore works (Appendix 17.2 , Volume 4)
			Impacts on unknown receptors are also mitigated through C-58 (Table 17-13), the assessment of geophysical data and C-59 (Table 17-13), the assessment of geotechnical data ensuring that unknown receptors are identified and assessed for archaeological significance followed by mitigation secured in C-57 (Table 17-13), the WSI document (Appendix 17.2 , Volume 4) and C-60 (Table 17-13), the avoidance of known receptors.

ID	PINS comments	Aspect	How this has been addressed in this PEIR
			It is expected that the process will be reflected in the DCO requirements or DML conditions.
4.13.9	The Inspectorate notes an important distinction between geophysical survey and geotechnical survey coverage. Paragraph 5.14.45 states "geophysical survey data covering 100 percent of the seabed within the development area, currently expected to be undertaken June / July 2020". However, paragraph 5.14.46 implies the only a "limited coverage survey" will be undertaken in support of the Application and that 100 percent coverage of the final design plan will be completed and reviewed prior to construction. The "limited coverage" geophysical survey to support the DCO application is not specifically quantified as a percentage of the development area. This should be presented as part of the ES. The basis for, and point at which, the "comprehensive programme of geotechnical survey data" would commence in terms of informing considering archaeological potential (and coverage of geotechnical survey) is not specifically stated. The Inspectorate understands that detailed geotechnical surveys will be undertaken prior to construction and that the outline WSI will set out it's specification so as the reliance placed on it at as mitigation in addressing potentially significant effects can be understood. The marine archaeological assessment chapter of the ES should clearly set out the	Marine archaeology	The extent of geophysical data coverage and data used to develop the marine archaeology baseline (Chapter 17, Section 17.6) as well as the marine archaeology study area (paragraph 17.4.2) is clarified in Chapter 17, Volume 4. Early archaeological engagement during the Rampion 2 geotechnical survey planning process is a requirement of embedded environmental measures C-57 and C-59 (Table 17-13) as well as Appendix 17.2, Volume 4 and will be detailed in geoarchaeology Method Statements. Regular meetings are held between the offshore and onshore team. It is expected that the process will be reflected in the DCO requirements or DML conditions. The assessment of sub-bottom data and an outline deposit model based on the results and desk-based studies is summarised in Chapter 17, Section 17.6 and detailed in Appendix 17.1, Volume 4.



ID	PINS comments	Aspect	How this has been addressed in this PEIR
	geoarchaeological considerations in the design and specification of the geotechnical survey.		commitments detailed in Appendix 17.2, Volume 4.
4.14	Socio-economics		
4.14.1	The Inspectorate considers that the impacts of construction, O&M and decommissioning activity on changes to population structure as a result of increased demand for labour and the subsequent demand for housing accommodation are likely to be negligible and any effects will be spread further wider than the immediate area. The Inspectorate agrees that these matters can be scope scoped out from the ES has significant effects are unlikely to occur.	Socio- economics	This comment is acknowledged.
4.14.2	The Inspectorate agrees that significant effects on inshore recreation activity during operation are unlikely and that the ES will assess operational effects in terms of offshore recreation. However, reference to ZoIs and study areas are made in paragraph 5.15.13 and table 5.15.1, without reference to spatial extent of "inshore" and "offshore" areas (see comments under 4.14.3below). Without fully understanding the extent of the inshore area as defined in the context of the socio- economic assessment (and the noted need for an assessment of offshore operational effects on	Socio- economics	Please refer to Figure 18.1 and Figure 18.2 , Volume 3 for an overview of the spatial extent of the various ZOIs used in the socio-economics assessment. Under the MDS considered no maintenance is anticipated to be required on the export cable located within the inshore zone (defined as the area extending 250m out to sea from landfall). The assessment of the Proposed Development's impact on inshore recreation during the operation and maintenance phase is considered alongside the impact on offshore recreation.



ID	PINS comments	Aspect	How this has been addressed in this PEIR
	recreation), the Inspectorate cannot agree to scope this matter out of the ES.		
4.14.3	Whilst Table 5.15.1 summaries the ZOIs to be considered for the various receptor groups as part of the socio-economic assessment, figures would assist in understanding their spatial extent and the entirety of the study area (onshore and offshore).	Socio- economics	Please see Figure 18.1 and Figure 18.2, Volume 3 for an overview of the spatial extent of the various Zones of Influence used in the assessment.
4.14.4	Any key assumptions made in developing estimates on the anticipated construction programme and phasing should be clearly set out and consideration given to a 'worst case' scenario in the duration and definition of 'temporary' effects and in considering the overall significance of effect (eg around the amounts of goods and services to be sourced locally / regionally / nationally). This includes assumptions on the use of local ports for construction. Reference is made to the development of "two scenarios based on varying assumptions in the amounts of goods and services sourced from within Sussex and the UK, in addition to the use of local ports". It is not clear whether the "two scenarios based on varying assumptions" are intended to represent alternative "realistic" scenarios, or whether they are "best case" / "worst case" in terms of local, regional or national impacts. This should be set out clearly in the ES.	Socio- economics	More detail on the approach to socio-economic impact assessment is presented in Chapter 18 , Section 18.8 . Additional detail on the 'scenarios' considered is presented in Appendix 18.1 : Socio-economics cost and sourcing report , Volume 4 . Following discussions with RED, it was decided that a single scenario which represents a realistic base case (i.e. worst-case), is considered. That said, when considering jobs and the economy, the overall impact is anticipated to be positive. Overall, there is potential for local expenditure to be higher than that identified in the assessment, generating additional benefits.

ID	PINS comments	Aspect	How this has been addressed in this PEIR
4.14.5	A number of sources set out in table 5.15.3 are stated as "TBD", including Recreational activity and Ports and harbour infrastructure for which the coverage of the study area is also stated as "TBD". It is unclear whether these datasets would be obtained in the course of data collection from other aspect chapters. The ES should clearly set out these data sources and their spatial coverage and how all of these have been derived from and the effort made to agree with relevant consultation bodies.	Socio- economics	A detailed list of data and information sources used in the assessment is set out in Appendix 18.2: Socio-economics technical baseline, Volume 4. Furthermore, a list of the stakeholders approached as part of the socio-economics assessment is presented in Chapter 18, Section 18.5. This includes references to discussions about and approach to collating key data sources (where relevant).
4.14.6	The ES should take account of the current West Sussex County Council Economic Growth Plan 2018-2023 in considering baseline conditions and assessing significance of socio-economic effects.	Socio- economics	Local Policy (including the West Sussex County Council Economic Growth Plan 2018-2023) is considered in detail in Appendix 18.2, Volume 4 and summarised in Chapter 18, Section 18.3 .
5	ASPECT BASED SCOPING TABLES - ONSHORE		
5.1	Landscape and visual amenity		
5.1.1	The Scoping Report states that the cable corridor will be reinstated and restored post construction. There are insufficient details in the Scoping Report to understand the type of landscape features which may be lost during the construction phase and also no details of the types of planting which may not be allowed during reinstatement (for example, lack of tree planting on and near to the cable corridor). The cable corridor may look	Landscape and visual amenity	The effects of the onshore cable corridor on landscape and visual receptors post construction have been summarised in the main assessment in Chapter 19, Sections 19.9 and 19.10 , and detailed in Appendix 19.3: Landscape assessment, Volume 4 .

ID	PINS comments	Aspect	How this has been addressed in this PEIR
	very different during operation as it did preconstruction. On this basis, the Inspectorate does not agree to scope this matter out.		Strategic principles to the landscape design and approach to embedded environmental measures are presented in Chapter 19 , Section 19.7 .
			Further information about the landscape design and assessment of landscape elements (including arboriculture survey) will be provided in the ES.
5.1.2	The Scoping Report states that any receptors beyond the Zone of Theoretical Visibility will not have a view of the onshore elements and impacts are therefore scoped out. The information provided in the Scoping Report lacks detailed information from which to be able to fully understand what the ZTV applied is. The ES must include a clear figure of an appropriate scale and size to present the ZTV as well as justification for definition of study areas and sensitive receptors within the ZTV.	Landscape and visual amenity	Zones of Theoretical Visibility (ZTVs) for the onshore substation search area options and the onshore cable corridor are illustrated in Figures 19.3a to 19.4d , Volume 3 .
			For the avoidance of doubt, if an area on these maps is shown to be outwith the ZTV then there will be <u>no view</u> of the onshore elements of the Proposed Development from these locations and are therefore scoped out. The technical basis for the ZTV is described in Chapter 19 , Section 19.4
5.1.3	A 2km study area is proposed on the basis that the same study area was used for Rampion 1. The study area for the Proposed Development should be applied taking into account specifics for the area around the proposed cable route.	Landscape and visual amenity	A 2km study area is proposed for the LVIA. Detail and justification for the study area is provided in Chapter 19, Section 19.4 .

ID	PINS comments	Aspect	How this has been addressed in this PEIR
5.1.4	The scale of the figures provided in the Scoping Report show the route of the cable corridor in its entirety and it is therefore difficult to understand which landscape receptors may be affected. The ES should contain figures at a scale which would ensure that the content is more easily understood.	Landscape and visual amenity	Detailed figures illustrating the landscape and visual receptors within the onshore cable corridor and the study area are illustrated in Figures 19.5a-biii, 19.6a-b and 19.7a-b, Volume 3.
5.1.5	The Inspectorate expects the assessment to have regard to the Strategy for the West Sussex Landscape; Local Distinctiveness Study of West Sussex as well as the High Weald AONB Management Plan 2019-2024	Landscape and visual amenity	Acknowledged. These documents have been taken into consideration in the assessment in Chapter 19, Section 19.9 , and in Appendix 19.3 , Volume 4 .
5.1.6	High Weald AONB is shown in Figure 6.2.3 to be in the study area for LVIA, however paragraph 6.2.39 state that this is beyond the study area. On the basis that the nature, scale and location of the works at the proposed and existing substations (including connection between them) are not fully defined at this stage, an assessment of significant effects on the AONB should be provided as part of the ES (including cross reference to the SLVIA and socio-economic assessments).	Landscape and visual amenity	Indirect landscape effects on the High Weald (AONB) and its Special Landscape Qualities are assessed in Appendix 19.3, Volume 4 and summarised in Chapter 19, Section 19.9.
5.1.7	There are no details provided in the Scoping Report regarding landscape effects on community amenities, or schools. The ES should assess impacts on all receptors groups and the location of those receptors which have	Landscape and visual amenity	Visual effects on community amenities or schools are included within the assessment of settlements, where relevant.



ID	PINS comments	Aspect	How this has been addressed in this PEIR
	been assessed should be included in clear figures at an appropriate scale.		
5.1.8	The Scoping Report refers to impacts beyond and in the ZTV, however it is not currently clear what the ZTV for onshore works and the substation are as no ZTV has been prepared. The ES should provide details of the ZTV for all onshore workings and assessments should be made for impacts during construction, operation and decommissioning.	Landscape and visual amenity	ZTVs for the onshore elements of the Proposed Development (onshore substation search area options and the onshore cable corridor) are illustrated in Figures 19.3a to 19.4d , Volume 3 . The LVIA includes an assessment of the onshore elements of the Proposed Development during the construction, operation and maintenance, and decommissioning phases.
5.1.9	The proposed substation location is identified as being 'near to' the existing Bolney substation. With approximate dimensions of 300m x 150m x 15m, the effects on landscape and visual amenity of this new structure by itself and any cumulative impacts with the existing substation and other existing or proposed structures, should be assessed in the ES.	Landscape and visual amenity	The LVIA includes the assessment (Chapter 19, Sections 19.9 and 19.10) of the onshore substation search area options, taking into account other similar developments within the study area including the nearby National Grid Bolney substation and Rampion 1 onshore substation.
5.1.10	The Scoping Report states that loss of landscape features such as trees, hedgerows, Ancient Woodlands will be avoided "where possible". A tree survey and hedgerow survey should be completed to inform the ES. The ES should assess the impacts if such features are to be removed and explain any mitigation measures to reduce impacts.	Landscape and visual amenity	An arboricultural survey is not part of the PEIR and will be carried out in summer 2021 which will inform the effects in the ES.

ID	PINS comments	Aspect	How this has been addressed in this PEIR
5.1.11	The Scoping Report states that up to 4 trenches will be required for the installation of the onshore corridor. The ES should report the number of trenches to be used and also dimensions of each and how long they would remain open for. The intention is to use trenchless techniques where possible; the ES should assess the landscape effects which may be created by open trenches.	Landscape and visual amenity	Chapter 19, Table 19-19 provides a summary of the maximum assessment assumptions of the onshore elements of the Proposed Development with a full description provided in Chapter 4, Section 4.4. Effects on landscape character/ elements as a result of the installation of the onshore cable corridor are assessed in Appendix 19.3, Volume 4 and summarised in Chapter 19, Section 19.9.
5.1.12	The ES should include all different types of development which may lead to a cumulative impact, not just those which are similar in nature to the Proposed Development. Details of agreements with relevant consultation bodies as to the scope of projects to be included should be presented as part of the ES.	Landscape and visual amenity	The approach to the CEA and cumulative developments included in the PEIR are reported in Chapter 5: Approach to the EIA, Section 5.10 and Appendix 5.4: Cumulative effects assessment shortlisted developments, Volume 4.
5.1.13	Efforts should be made to agree the location of viewpoints to assess impacts from the onshore cable corridor during construction and operation with relevant consultation bodies. Details of the agreement should be included in the ES.	Landscape and visual amenity	Viewpoints have been agreed with a number of stakeholders including South Downs National Park (SDNP), Natural England, West Sussex County Council, High Weald AONB and Horsham District Council as described in Chapter 19 , Section 19.3 .
5.1.14	It is noted that computer models will be used to inform the LVIA assessment, and the ES should contain details	Landscape and visual amenity	The methodology used to illustrate the ZTVs and visualisations is reported in Appendix 19.1: LVIA methodology, Volume 4.



ID	PINS comments	Aspect	How this has been addressed in this PEIR
	of these various methods used to inform the landscape and visual assessment		
5.1.15	The night time lighting assessment should be appended to the ES together with evidence of consultation with relevant bodies. Visual representations should also be included.	Landscape and visual amenity	Where required, construction lighting will be limited to directional task lighting positioned to minimise glare and nuisance to residents and recreational receptors as noted in Chapter 19 , Section 19.7 .
			The effects of lighting have been assessed in Appendix 19.2: Viewpoint analysis, Volume 4 and Appendix 19.4: Visual assessment, Volume 4.
			A lighting assessment in relation to the offshore elements of the Proposed Development (WTGs) is reported in Chapter 16 .
5.2	Air quality		
5.2.1	The Scoping Report proposes to scope out an assessment of air quality impacts from the on-site construction and decommissioning equipment. This conclusion is not justified through the provision of mobile plant and construction equipment numbers and details. The Applicant should provide specific details of the equipment required on site with justification for scoping them out of the assessment against relevant guidance and criteria. The Inspectorate also notes that there is	Air quality	Further information on the mobile plant and construction equipment required is presented along with an assessment of likely impacts on receptors in Chapter 20: Air quality, Section 20.9 and Section 20.11.



ID	PINS comments	Aspect	How this has been addressed in this PEIR
	further work to be done in terms of refinement of the route, locations of construction compounds and the location of the substation. Whilst these (and thus proximity to air quality sensitive receptors) are uncertain, the Inspectorate considers it premature to rule out likely significant effects during construction and decommissioning.		
5.2.2	The Inspectorate is content that there is unlikely to be significant emissions of odour during construction and therefore agrees that this matter can be scoped out of the air quality assessment. The Inspectorate notes the Applicant's intention at commitment C-6 to avoid areas of historic landfill through the design and DCO order limits and the agreement that this can be scoped out is on this basis.	Air quality	Acknowledged. Further refinement of the Proposed Development has resulted in the potential for construction activity to take place in/close to areas of historic landfill, and therefore an odour assessment has been carried out where appropriate. Impacts from odour during the operational and decommissioning phases remain scoped out.
5.2.3	The Inspectorate is content that there will be no significant emissions associated with the onshore cable or substation during operation and maintenance and this matter to be scoped out of the air quality assessment. However specific details should be provided on the amount of road traffic associated with the operational Proposed Development and how these relate to the IAQM/EPUK screening values set out in paragraph 6.3.3. With reference to the description of the Proposed Development, any potential sources of emissions from the proposed substation should also be set out in	Air quality	Further information on the mobile plant and construction equipment required is presented along with an assessment of likely impacts on receptors in Chapter 20, Section 20.10 .



ID	PINS comments	Aspect	How this has been addressed in this PEIR
	demonstrating significant effects on receptors sensitive to air quality can be ruled out.		
5.2.4	The Inspectorate is content that there is unlikely to be significant emissions of dust during operation and therefore agrees that this matter can be scoped out of the air quality assessment.	Air quality	Acknowledged.
5.2.5	The ES should set out the relevant ZoIs within which ecological effects from the construction works will be considered (both in terms of the cable route and substation works).	Air quality, Terrestrial ecology and nature conservation	 ZOIs are presented in Chapter 20, Section 20.8. ZOIs for all potential effects, including those related to dust are provided in Chapter 23, Section 23.6. Emissions associated with construction traffic and plant on all statutorily designated sites have been scoped out, in agreement with PINS, and are not considered further within this PEIR.
5.2.6	The Inspectorate agrees with the methodology for designating the proposed study area set out in paragraph 6.3.3. The study area for the assessment should be sufficiently broad to ensure that all receptors which could experience a significant effect are captured within the assessment. The ES should consider how traffic and transport due to construction of the Proposed Development would contribute to air quality levels in the relevant AQMAs. Effort should be made to agree the	Air quality	Acknowledged. The study area is detailed in Chapter 20, Section 20.4 . Locations likely to be affected by air quality impacts have been discussed with consultation bodies to ensure they are included in the assessment.

ID	PINS comments	Aspect	How this has been addressed in this PEIR
	extent of the study area with relevant consultation bodies and justified within the ES.		
5.2.7	The Scoping Report provides limited information regarding the need for surveys in order to characterise the baseline environment or otherwise inform the Air Quality Assessment. Paragraph 6.3.15 claims that existing data sources are sufficient to characterise the baseline air quality, without the need for further monitoring. Effort should be made to agree the requirement for additional baseline survey data with the relevant consultation bodies. The Applicant should set out in the ES any proposals for air quality monitoring of emissions from the Proposed Development during construction.	Air quality	Acknowledged. Further details on the existing baseline information are provided in Chapter 20, Section 20.6.
5.2.8	The Inspectorate would expect an Air Quality Management Plan to form part of the CoCP. The Applicant should ensure that drafts of these documents, demonstrating the minimum measures relied upon as mitigation, are submitted with the ES and appropriately secured.	Air quality	Acknowledged. An Air Quality Management Plan will be included within the Outline COCP .
5.2.9	The Inspectorate is satisfied with the methodology proposed, which is based on the Institute of Air Quality Management's (IAQM) (2014) Guidance on the assessment of dust from decommissioning and construction. The assessment should include an	Air quality, Terrestrial ecology and	Acknowledged. The assessment of emissions of dust from construction/decommissioning is presented in Chapter 20, Section 20.9 .

ID	PINS comments	Aspect	How this has been addressed in this PEIR
	examination of effects on both human and ecological receptors.	nature conservation	The assessment presented in Chapter 23 , Section 23.6 follows the criteria of the Institute of Air Quality Management (IAQM) regarding dust emissions.
5.2.10	The Inspectorate is satisfied with the methodology proposed, which is based on industry standard guidance (IAQM and Environmental Protection UK (EPUK)) and includes the assessment of effects on both human and ecological receptors. Paragraph 6.3.46 states that 'It is likely that the construction and decommissioning road traffic will be below IAQM thresholds for scoping out.' If this is the case the ES should include justification for its exclusion from the ES.	Air quality	An assessment of the air quality impacts of road traffic associated with the construction phase is given in Chapter 20, Section 20.9.
5.2.11	The air quality assessment should be informed by the TA and the projects transport consultants particularly with regards to defining the study area and the potential impact from vehicle movements during both construction and operation.	Air quality	It is not proposed to carry out a full Transport Assessment for the Proposed Development. However, the traffic characteristics are being evaluated and assessed as part of the EIA (Chapter 24: Transport) and the air quality assessment is being informed by this as the traffic modelling progresses. This PEIR includes an assessment based on the current traffic information at the PEIR stage in Section 20.9 and Section 20.10.

5.3 Soils and agriculture

ID	PINS comments	Aspect	How this has been addressed in this PEIR
5.3.1	The Inspectorate is content that there is unlikely to be a significant loss of agricultural land due to operational and maintenance or decommissioning activities and therefore agrees that this matter can be scoped out of the soils and agriculture assessment.	Soils and agriculture	This comment is acknowledged. Loss of agricultural land due to operation and maintenance or decommissioning activities has been scoped out of this PEIR. It is anticipated that the onshore electrical cables will be left in- situ with ends cut, sealed and buried as outlined in Section 4.7.11 of Chapter 4: The Proposed Development to minimise environmental effects associated with removal. Please refer to Chapter 21: Soils and agriculture.
5.3.2	The Inspectorate is content that there is unlikely to be a significant loss of soil due to operational and maintenance activities and therefore agrees that this matter can be scoped out of the soils and agriculture assessment.	Soils and agriculture	This comment is acknowledged. Loss of soil resources during operation and maintenance phase has been scoped out of this PEIR chapter as soil resources will be protected by the site-specific Outline Soil Management Plan (SMP) to be produced using information gathered in the baseline survey (Chapter 21).
5.3.3	The Inspectorate welcomes the use of the Government's policy for the protection of the best and most versatile (BMV) agricultural land as set out in paragraph 112 of the National Policy Planning Framework (NPPF). The Inspectorate also expects that 'soils' should be considered under a more general heading of sustainable use of land and the ecosystem services they provide as	Soils and agriculture	Chapter 21 considers the many ecosystem services that soils provide (flood mitigation, food production, supporting biodiversity etc.), these will be protected by embedded environmental measures (Table 21-11).



ID	PINS comments	Aspect	How this has been addressed in this PEIR
	a natural resource in line with paragraph 109 of the NPPF.		
5.3.4	It is considered that the handling, storage and reinstatement of soil should be conducted in accordance with a Soil Management Plan (SMP) which sets out good practice mitigation to minimise adverse effects on the soil resource. The Applicant should refer to guidance set out in the Department for Environment, Food and Rural Affairs (DEFRA) 'Construction Code of Practice for the Sustainable Use of Soils on Construction Sites'. The Scoping Report identifies that a SMP is planned in Chapter 6.2, however, there was no references to this in Chapter 6.4. The Inspectorate welcomes and encourages consistent cross references between the aspect chapters. The ES should address how soils and agriculture will be managed and describe any assumptions made. Any mitigation required should be explained in the ES and appropriately secured.	Soils and agriculture	An Outline SMP will be implemented which will protect soil resources from damage during the construction phase. This is an embedded environmental measure (C-183), as presented in Chapter 21, Table 21-9 . The Outline SMP will be provided alongside the ES at DCO Application submission. The Outline SMP will make references to relevant guidance from the Defra <i>Construction Code of Practice for the Sustainable use of Soils on Construction Sites</i> (Defra, 2009a). The ES will address how soils and agricultural land will be managed during the construction phase of the Proposed Development and relevant mitigation will be described and secured in the commitments register.
5.3.5	The consideration of the potential impacts on agricultural land should also be assessed in the context of socio- economics, namely those financial effects on productive farmland and small holdings during construction, operation and decommissioning. With this in mind, the Inspectorate welcomes the acknowledgement of the inter-relationship between the socio-economic and soils/agriculture.	Soils and agriculture	The financial effects on productive farmland and small holdings during construction, operation and decommissioning will be considered in the final ES following completion of ongoing landowner engagement and finalisation of the design. Further details are provided in Chapter 21 , Section 21.14 .

ID	PINS comments	Aspect	How this has been addressed in this PEIR
5.3.6	The Scoping Report commits to onsite soil survey/sampling. The Inspectorate welcomes this survey and recommends that effort should be made to agree the survey locations with relevant consultation bodies	Soils and agriculture	The proposed survey observations have been shared with Natural England (the statutory consultees) to confirm the proposed locations and density. Further engagement with Natural England in relation to the survey methodology and observation points will be undertaken as the design is refined.
5.3.7	Careful consideration should be given to the siting of the onshore infrastructure in relation to grade 1 and grade 2 agricultural land; the potential temporary and permanent loss of Agricultural Land Classification (ALC) land should be assessed within the ES. The potential effects on soil quality should be considered and relevant mitigation measures proposed where significant effects are likely to occur.	Soils and agriculture	Best and most versatile land (BMV) has been considered as an environmental constraint in the design of the Proposed Development (refer to Chapter 3: Alternatives). BMV agricultural land will be further defined to confirm the Agricultural Land Classification (ALC) grades within the PEIR Assessment Boundary through the field survey planned for 2021. The preliminary assessment is outlined in Chapter 21, Section 21.9 and Section 21.10 and embedded environmental measures are provided in Table 21-9 .
5.4	Noise and vibration		
5.4.1	Based on the anticipated low levels of site traffic during operation and maintenance, the Inspectorate is content that there will be no significant noise emissions associated with the onshore cable or substation	Noise and vibration	Acknowledged. Noise emissions associated with site traffic during operation and maintenance is scoped out of the assessment due to the very low

ID	PINS comments	Aspect	How this has been addressed in this PEIR
	maintenance in terms of additional site traffic during operation.		numbers of vehicles expected for operation and maintenance.
			Please refer to Chapter 22: Noise and vibration.
5.4.2	The Inspectorate agrees that noise effects of the offshore substation would not have significant effects for any onshore receptors. The Inspectorate is satisfied that the scope of the underwater noise assessment is sufficient to consider offshore substation noise effects on offshore and marine receptors where significant effects are likely to occur.	Noise and vibration	Acknowledged. The noise effects from the operation of the offshore substations on onshore receptors are therefore scoped out of the noise assessment in this chapter due to the large distances between noise source and receptor. The underwater noise assessment is included in Chapter 11 .
5.4.3	The Inspectorate agrees that vibration effects to onshore receptors as a result of the offshore substations and WTGs can be scoped out of further assessment. The Inspectorate does not agree that vibration effects from the onshore substation scoped out as insufficient justification has been provided at this time to support this approach (including operational design parameters of the proposed substation). The ES should assess these matters where significant effects are likely to occur.	Noise and vibration	Acknowledged. The vibration effects to onshore receptors as a result of offshore substations and wind turbines are scoped out of the assessment in this chapter due to the large distances between vibration source and receptor. The assessment of vibration from the onshore substation will be reviewed at the ES stage, when the further detail of the onshore substation is available. However, it may not be possible to provide a quantitative assessment of vibration from the onshore substation as it will likely be negligible even very close to the equipment and therefore significant effects unlikely to occur.

ID	PINS comments	Aspect	How this has been addressed in this PEIR
			Please refer to Chapter 22.
5.4.4	The Scoping Report has scoped out Noise and vibration disturbance during decommissioning works on the basis that the effects of decommissioning will be lower than those experienced during construction. The Inspectorate does not agree that this can be scoped out at this stage as the noise and vibration effects and subsequent mitigation have not been quantified for the construction phase. Although the noise and vibration disturbance during decommissioning works are likely to be similar or potentially lower than during construction, the ES should assess these matters where significant effects are likely to occur.	Noise and vibration	A decommissioning assessment is included in Chapter 22, Section 22.11.
5.4.5	Paragraph 6.5.31 of the Scoping report states that 'Once the locations of the Proposed Development have been decided upon, the existing data will be reviewed to ascertain its potential use in the assessment'. The Inspectorate expects a project specific baseline survey, with the assessment methodology and choice of noise receptors should be agreed with the relevant local planning authorities. The Applicant's attention is directed to the Joint Guidance produced by the Association of Noise Consultants (ANC) and the Institute of Acoustics (IoA) "Joint Guidance on the Impact of COVID-19 on the Practicality and Reliability of Baseline Sound Level	Noise and vibration	A baseline noise survey will be developed with the methodology and noise receptors agreed with the relevant local planning authorities beforehand. The baseline noise survey will be carried out in 2021 after restrictions associated with the COVID-19 pandemic have been removed. The results of the baseline noise survey will be incorporated into the ES. Should COVID-19 pandemic restrictions be reimposed or not fully lifted, a baseline survey will still be undertaken, but with regard to the latest guidance on noise surveys during lockdown and with consideration on how the restrictions have

ID	PINS comments	Aspect	How this has been addressed in this PEIR
	Surveying and the Provision of Sound & Noise Impact Assessments during the current COVID-19 pandemic".		affected the survey. The methodology would be agreed with the relevant local planning authorities beforehand.
5.4.6	Paragraph 6.5.4 of the Scoping Report states that the spatial scope of the construction noise assessment would be "a 1 km buffer zone around the cable route potential centreline and substation boundary". The Inspectorate expects further explanation and justification be provided in the ES to support the study area used for the assessment with reference to specific receptors or groups of receptors.	Noise and vibration	Further explanation and justification has been provided in Chapter 22, Section 22.4 .
5.4.7	Information should be provided on the types of vehicles and plant to be used during the construction phase. The assessment should consider a 'worst case' for receptors, i.e. that within the application site the vehicles and plant are located at the closest possible point to a receptor.	Noise and vibration	Information on the types of vehicles and plant to be used, along with percentage on times are provided in Chapter 22, Appendix 22.1 .
5.4.8	The Inspectorate notes that there is little reference to other receptor types that may be sensitive to noise and vibration, such as ecological receptors. The Inspectorate welcomes consideration of noise impacts on nature conservation areas and other ecological receptors (e.g. protected species). The noise assessment should cross- refer to the findings of other relevant aspect chapters, such as terrestrial ecology and offshore ornithology. The	Noise and vibration	The assessments of noise and vibration on offshore ornithology, terrestrial ecology and heritage receptors are provided in Chapter 12 , Chapter 23 and Chapter 26 respectively.

ID	PINS comments	Aspect	How this has been addressed in this PEIR
	ES should clearly explain any assumptions made regarding the assessment of likely significant effects arising from noise and vibration on sensitive ecological receptors		
5.4.9	The scoping report sets out that a CoCP and decommissioning plan will be developed as part of the DCO application. No mention is made however of a noise mitigation plan. The Inspectorate expects that such a plan or specific noise mitigation measures would be set out and secured through the CoCP or otherwise where they are relied upon in the assessment of significance of residual effects.	Noise and vibration	Noise measures will be included within the Outline COCP .
5.5	Terrestrial ecology and nature conservation		
5.5.1	The Inspectorate agrees that this impact can be scoped out on the basis that no land within a European site(s) will be lost as a result of the Proposed Development. No European sites are within the redline boundary as shown on Figure 6.6.4.	Terrestrial ecology and nature conservation	The location of constituents of the national site network within the context of the onshore part of the PEIR Assessment Boundary is provided in Chapter 23, Section 23.6 . No land-take or land cover change within a SAC or Special Protection Area (SPA) is proposed, maintaining the position presented in the Scoping Report.
5.5.2	Pagham Harbour SPA is located over 10km from the proposed landfall point. States that due to distance, it suggests that black bellied Brent geese are not linked to the SPA. The Inspectorate agrees that this matter can	Terrestrial ecology and	Pagham Harbour Ramsar site and SPA is scoped out and is not considered further within this PEIR. This is on the basis that the onshore part of the PEIR Assessment Boundary is further from

ID	PINS comments	Aspect	How this has been addressed in this PEIR
	based on the distance between the designated sites and the proposed landfall point. Natural England also agree that this matter can be scoped out on the basis of the distance of 10km being an established upper foraging distance for Brent geese.	nature conservation	Pagham Harbour (11.5km) than that displayed within the Scoping Report, with no change in potential effects being identified between that report and the assessment within this PEIR.
5.5.3	The paragraph numbers to which the reader is referred $(6.6.56 - 6.6.59)$ appears to be incorrect. Although literature is cited in support of the Applicant's position, the Inspectorate does not agree to scope out habitat fragmentation effects on these features of the SPA. The Inspectorate does not consider that sufficient evidence has been provided to demonstrate that the cable route would not affect or cause deterioration to land that could support these species and be functionally linked to the SPA and as such its loss or deterioration resulting from the Proposed Development's cable route could have an impact on the SPA and should be assessed in the ES.	Terrestrial ecology and nature conservation	Wintering bird surveys have commenced and are ongoing within the relevant areas of the Arun Valley and Adur Valley. One element of this survey is the recording of species listed as designated features on the Arun Valley SPA and Ramsar site. A preliminary assessment of the potential effects of fragmentation on features of the Arun Valley SPA and Ramsar site is provided within Chapter 23 and will be updated in the ES once a full data set is available (see Section 23.10). A summary of the current baseline position is provided within Section 23.5 .
5.5.4	The only European site within 2.5km of the scoping boundary is the Solent and Dorset Coast SPA (designated for tern species). On the basis of the embedded measure C-76, the Inspectorate agrees that this matter can be scoped out.	Terrestrial ecology and nature conservation	Pollution events associated with works above mean high water springs (MHWS) have been considered in Chapter 23, Section 23.6 within which they are scoped out on the basis of the embedded environmental measures described in Section 23.8 .

ID	PINS comments	Aspect	How this has been addressed in this PEIR
5.5.5	The Inspectorate agrees that this matter can be scoped out based on the temporary and transient nature of the effect, the location of the nearest European sites and SSSI's and the limited amount of traffic likely serving construction at any single location. The Inspectorate also notes that this approach in line with advice from Natural England as cited in paragraph 6.6.68, and Natural England have not expressed concern in their scoping consultation response relating to the Proposed Development.	Terrestrial ecology and nature conservation	Emissions associated with construction traffic and plant on all statutorily designated sites were scoped out following the issue of the Scoping Opinion and are not considered further within this PEIR.
5.5.6	The Scoping Boundary does not overlap with any European sites, so it is agreed that these matters can be scoped out. However the possibility for the spread of non-native invasive species via watercourses to designated sites which are hydraulically linked should be assessed within the ES where significant effects are likely to occur	Terrestrial ecology and nature conservation	The potential for the spread of INNS is assessed in Chapter 23, Section 23.6 , in light of embedded environmental measures detailed in Section 23.8 .
5.5.7	The Inspectorate agrees that this matter can be scoped out on the basis that there would be no land take or land cover changes outside of the scoping boundary.	Terrestrial ecology and nature conservation	Land take/land cover change is considered with regard to one SSSI immediately adjacent to the onshore part of the PEIR Assessment Boundary and four Local Wildlife Sites (LWS) within it. The baseline situation is described in Chapter 23 , Section 23.5 and the assessment of likely significant effects provided in Section 23.9 .

ID	PINS comments	Aspect	How this has been addressed in this PEIR
5.5.8	The Scoping Report is seeking to scope out all SSSIs which are not located within the Scoping Boundary, features would not be expected to move regularly between the designated sites and the construction area. The Inspectorate does not agree that this matter can be scoped out as insufficient justification has been provided. The ES should assess this matter where significant effects are likely to occur.	Terrestrial ecology and nature conservation	 Chapter 23, Section 23.5 identifies all SSSIs within 5km of the onshore part of the PEIR Assessment Boundary (or 12km for SSSIs that cite one or more bat species). Sections 23.6 and 23.10 assess the likely significant effects on the mobile features of the SSSIs identified from the fragmentation of habitats.
5.5.9	The Inspectorate does not agree that impacts as a result of noise and vibration should be scoped out for all SSSIs outside of the red line boundary. Some of the SSSIs scoped in by the Applicant have interest features which could be impacted by vibration and noise generated by the proposal some of which have the potential to be transient between areas and SSSI's outside of the redline boundary. The ES should assess this matter where significant effects are likely to occur	Terrestrial ecology and nature conservation	 Chapter 23, Section 23.5 identifies all SSSIs within 5km of the onshore part of the PEIR Assessment Boundary (or 12km for SSSIs that cite one or more bat species). Sections 23.6 and 23.10 assess the likely significant effects on the mobile features of the SSSIs identified due to noise and vibration.
5.5.10	No SSSIs within 5km of the Scoping Boundary have been found to support bat species as designated features. The foraging distance of some bats species extends further than 5km and as such the Inspectorate does not agree to scope this out as insufficient justification has been provided. The ES should assess this matter where significant effects are likely to occur	Terrestrial ecology and nature conservation	A search for SSSIs within 12km of the onshore part of the PEIR Assessment Boundary supporting bats has been undertaken Chapter 23 , (Section 23.5). No SSSIs within this search distance support bats as a designated feature. The potential effects of light on bat species as features of SSSIs is thus discounted and not considered further within this chapter.

ID	PINS comments	Aspect	How this has been addressed in this PEIR
			The effects of light on bats not associated with SSSIs is provided in Section 23.10 .
5.5.11	Impacts on changes to hydrology to SSSIs and LWS outside of the ZoI (deemed as 1km for this matter) are proposed to be scoped out. The Inspectorate does not agree that this matter can be scoped out as insufficient justification has been provided at this time to support this approach. The ES should ensure that hydrological impacts are assessed where significant effects are likely with further justification around the appropriateness and extent of the 1km ZoI.	Terrestrial ecology and nature conservation	The ZOI used within this chapter is that established within Chapter 27: Water environment to assess the potential for changes in hydrology. This is based on the water environment in the area (e.g. catchments) and not on a simple measure of distance. Chapter 23, Section 23.6 uses information in Chapter 27 to identify the SSSIs and LWS that may be at risk of a likely significant effect associated with potential hydrological changes due to the project. Assessment of those effects resulting on designated sites is provided in Section 23.10 .
5.5.12	There are no SSSIs within 500m of the scoping boundary. On the basis of the embedded measure C-76, the Inspectorate agrees that this matter can be scoped out of the ES as significant effects are unlikely to occur.	Terrestrial ecology and nature conservation	Two SSSIs are located within 500m of the onshore part of the PEIR Assessment Boundary (see Chapter 23, Section 23.5) and likely significant effects on these have been subject to assessment in this document (see Sections 23.6 and 23.10). Embedded environmental measures are described within Section 23.8 .

ID	PINS comments	Aspect	How this has been addressed in this PEIR
5.5.13	The possibility for the spread of non-native invasive species via watercourses to designated sites which are hydraulically linked should be assessed within the ES.	Terrestrial ecology and nature conservation	The potential for the spread of invasive non- native species, including those by hydrological means, is assessed in Chapter 23, Section 23.6 , in light of embedded environmental measure C- 107 detailed in Section 23.8 .
5.5.14	The Inspectorate agrees that this matter can be scoped out on the basis that there would be no land take or direct effects to habitat outside of the scoping boundary.	Terrestrial ecology and nature conservation	Four LWS are located within the onshore part of the PEIR Assessment Boundary (see Chapter 23, Section 23.5). An assessment of the likely significant effects of fragmentation of habitats resulting on these designations is provided in Section 23.10 , and embedded environmental measures detailed in Section 23.8 . LWS outside of the PEIR Assessment Boundary are not considered with regards fragmentation of habitats as per the Scoping Opinion.
5.5.15	The Inspectorate does not agree that this aspect can be scoped out as insufficient justification has been provided at this time to support this approach.	Terrestrial ecology and nature conservation	The likely significant effects resulting on LWS from lighting are considered in Chapter 23 , Section 23.6 and embedded environmental measures detailed in Section 23.8 .
5.5.16	On the basis of the embedded measure C-76, the Inspectorate agrees that this matter can be scoped out	Terrestrial ecology and nature conservation	Pollution events and resulting effects associated with works above MHWS have been considered in Chapter 23, Section 23.6 within which they are scoped out on the basis of the embedded

ID	PINS comments	Aspect	How this has been addressed in this PEIR
			environmental measures detailed in Section 23.8 .
5.5.17	The Inspectorate considers that insufficient information is provided to support the scoping out of breeding birds from assessment entirely at this stage. The Inspectorate understands the embedded environmental measures in place to maintain legal compliance in this regard. However, the proposed working corridor for onshore cable installation (of up to 50m, and wider in respect of special crossings) as well as construction and operation of the onshore substation could require considerable destruction of habitat suitable for breeding birds. The Inspectorate therefore expects the ES to the detail such measures that would be employed and how they would be secured. The ES should assess this matter where significant effects are likely to occur	Terrestrial ecology and nature conservation	The survey programme includes for breeding bird surveys in 2021 (see Chapter 23, Table 23-7). Section 23.5 describes the current baseline (from desk study only), with preliminary assessment provided in Section 23.10. Embedded environmental measures are described within Section 23.8. The ES will assess likely significant effects should they remain.
5.5.18	The onshore cable corridor will pass near to or through existing watercourses, where trenched and / or special crossings may be required. The impacts of the Proposed Development upon fish species should be assessed in the ES. This should include impacts on migratory species such as eel, sea lamprey and sea trout. Cross reference should be provided to offshore fish and shellfish.	Terrestrial ecology and nature conservation	The evolution of design and future survey will inform an assessment of the potential effects on fish. This will be reported upon in the ES and include cross reference as appropriate. Chapter 23, Section 23.6 provides a preliminary assessment for fish.

ID	PINS comments	Aspect	How this has been addressed in this PEIR
5.5.19	Where the Applicant concludes beneficial / positive effects which are reliant on successful implementation of biodiversity improvement / enhancement measures, evidence will need to be provided in the ES that the decision maker can be confident in their delivery thorough the DCO and / or other supporting legal mechanisms.	Terrestrial ecology and nature conservation	Assessment of beneficial/positive effects as a result of the Proposed Development is addressed within Chapter 23, Section 23.10 , but will be detailed in the ES.
5.5.20	The ES Applicant should also assess any potential for likely significant effects to wildlife through altered thermal and EMF from buried cables, to which no reference is made in the Scoping Report (with cross reference to the Soils and Agriculture aspect chapter).	Terrestrial ecology and nature conservation	The potential effects of EMF are considered within Chapter 23 , Section 23.6 .
5.6	Transport		
5.6.1	The Inspectorate agrees that this matter can be scoped out on the basis that no hazardous loads are anticipated by the Applicant during construction or operation of the Proposed Development.	Transport	Acknowledged. Hazardous loads have therefore been scoped out of the assessment within the PEIR and ES.
5.6.2	The Scoping Report advises that the operation and maintenance requirements of the onshore part of the Proposed Development would be occasional and therefore there would only be a limited number of vehicle movements. Whilst no further quantification of vehicle movements during operation has been provided, the Inspectorate is content that such activities will be	Transport	Acknowledged. The assessment of operation and maintenance activities from the onshore works resulting in potential impacts on roads has been scoped out of the PEIR and ES. The operational effects on existing PRoWs of permanent onshore elements of the Proposed

ID	PINS comments	Aspect	How this has been addressed in this PEIR
	below the threshold at which potentially significant effects could occur. Paragraph 6.7.49 of the Scoping Report does not provide any justification as to operational effects on PRoW. Whilst the impacts in this regard are likely to be predominantly experienced during construction, the ES should also consider the potential for significant effects during operation including (eg as a result of permanent diversions / changes to PRoW around the cable route and substation).		Development have been considered within an appended Outline PRoWMP (Appendix 24.2: Outline Public Rights of Way Management Plan, Volume 4).
5.6.3	The Scoping Report has scoped out potential impact on local roads, PRoW and the users of these routes during decommissioning works on the basis that the effects of decommissioning will be lower than construction. The Inspectorate is unable to agree that this can be scoped out at this stage as the effects and subsequent mitigation have not been quantified for the construction phase. Although the transport impacts during decommissioning works would be similar or potentially lower than during construction, the ES should assess these matters where significant effects are likely to occur.	Transport	Acknowledged. It is proposed that all onshore and offshore subsurface cable infrastructure will be left in situ as part of the decommissioning phase (outlined in Chapter 4: The Proposed Development). Decommissioning effects will relate only to the removal of the onshore substation and traffic generation will therefore be lower than during construction. An assessment of the decommissioning effects of the onshore substation is included in Chapter 24 , Section 24.12 .
5.6.4	The Scoping Report states that the study area for the transport assessment will consider the onshore elements of the Scoping Boundary (and the "key routes outside" of this boundary). Routes that construction and	Transport	Construction traffic routeing patterns are presented in Chapter 24, Section 24.8 . The key routes have been agreed with the relevant transport and highways providers to

ID	PINS comments	Aspect	How this has been addressed in this PEIR
	operational traffic will take will be reviewed and amended in response to refinement of the onshore. The Inspectorate recommends that the geographical extent of the study area (with particular reference to "key routes" outside the Scoping Boundary) is agreed with the relevant highways authorities and Network Rail (where applicable).		inform the highways link assessments in this chapter. The Study Areas are provided in Section 24.4 and Figures 24.5 and 24.6, Volume 3.
5.6.5	The Inspectorate welcomes the Applicant's intention to agree the scope of assessment with the relevant consultation bodies. This is particularly important in agreeing the baseline position and the receptors which will be deemed sensitive in the assessment. It is also important that methodologies are justified, for example, why the Guidelines for the Assessment of the Environmental impact of Road Traffic (GEART) has been chosen over Design Manual for Roads and Bridges (DMRB). Where the scope differs from that requested by the relevant consultation bodies, the ES should provide justification for the alternative approach.	Transport	The scope of the assessment outlined in Chapter 24, Section 24.4 including baseline and receptors have been initially discussed with key stakeholders including West Sussex County Council (WSCC) and Highways England (further details provided in Section 24.3). Use of GEART has been applied to this environmental assessment chapter as set out in Section 24.9. The Design Manual for Roads and Bridges (DMRB) (Standards for Highways, 2020) guidelines have been used within the Outline Construction Traffic Management Plan (CTMP) (Appendix 24.1: Outline Construction Traffic Management Plan, Volume 4) when setting out proposed permanent access designs and will be used at the DCO submission should a Transport Assessment (TA) be deemed necessary to support the Application. Further consultation with WSCC and Highways England will occur between PEIR and ES

ID	PINS comments	Aspect	How this has been addressed in this PEIR
			regarding the need for a TA and the application of DMRB standards.
5.6.6	The Scoping Report makes limited reference to how data will be collected to form the baseline assessment. The Inspectorate would expect the Applicant to agree the scope of any further baseline information to inform the assessment with the relevant authorities. The Inspectorate acknowledges the Applicants concerns regarding COVID-19 restrictions, the Applicant should refer to the advice provided in Section 3.4 of this Scoping Opinion.	Transport	Discussion with WSCC on baseline surveys is set out in Chapter 24 , Section 24.3 . Details on the collation of the baseline data and how the COVID-19 pandemic issues have been addressed are in Section 24.5 . An agreement was reached with WSCC regarding the use of historic data for the PEIR assessment which will be updated with new traffic counts in 2021 for the DCO submission should COVID-19 pandemic restrictions be lifted.
5.6.7	The transport assessment should include an assessment of the potential impact on the rail network. Figure 6.7.1 indicates that several operational railway lines would be crossed. The assessment should also consider the potential impacts of any construction or diversion activities on public transport.	Transport	As part of the embedded environmental measures as part of the Proposed Development, it is proposed to provide a trenchless crossing via HDD of the rail network in two locations (outlined in commitment C-5) and therefore there will not be an impact on the rail infrastructure as set out in Chapter 24 , Table 24-21 .
5.6.8	No information is provided regarding any onshore vehicular movements associated with marine elements of the work (if any, and particularly in reference to nearshore / intertidal works). These should be included within the ES where significant effects are likely to	Transport	Consideration is given to the traffic generation related to the onshore impacts of offshore works in the operation and maintenance phase. This is set out in Chapter 24, Section 24.11 .

ID	PINS comments	Aspect	How this has been addressed in this PEIR
	occur. It is noted in paragraph 6.7.2 of the Scoping Report that the scope of offshore transport effects (beyond mean high water springs) are proposed to be considered elsewhere in the ES).		Details as to why onshore impacts of offshore works in the construction phase are not considered are set out in paragraph 24.4.11 .
5.6.9	The Inspectorate welcomes the commitment to produce a Construction Traffic Management Plan (CTMP), Abnormal Indivisible Load (AIL) access study and PRoW Management Plan. Drafts of these documents should be provided with the DCO application. It should be clear how the implementation of such plans would be secured in the DCO and the Applicant should consider how this plan would interact with the CoCP and other relevant plans.	Transport	Emerging preliminary drafts of the Outline CTMP (Appendix 24.1, Volume 4), Outline Public Rights of Way Management Plan (PRoWMP) (Appendix 24.2, Volume 4), and Outline Abnormal Indivisible Load (AIL) Assessment (Appendix 24.3, Volume 4) have been prepared for PEIR stage.
5.6.10	Any cross-referencing between aspect chapters should be clear within the ES and the Inspectorate welcomes the consideration of interrelationships on traffic and transport.	Transport	Cross referencing with other related discipline chapters is clearly set out throughout the chapter.
5.7	Ground conditions		
5.7.1	The Inspectorate considers that given the nature of the development the conclusion is reasonable and therefore agrees that these matters can be scoped out of the assessment. This is based on the justification that any maintenance would be subject to The Construction (Design and Management) (CDM) Regulations 2015 and	Ground conditions	Acknowledged agreement to scope out effects from exposure to contamination via direct contact, inhalation and/or ingestion of soils and dusts resulting in health effects during

ID	PINS comments	Aspect	How this has been addressed in this PEIR
	safe working practices as part of normal construction health and safety management under the Health and Safety at Work Act (1974) and regulations made under the Act. The Inspectorate agrees that, with the implementation of measures to limit any potential pollution incidents, any potential impacts on ground conditions are unlikely to result in significant effects and therefore further assessment is not required. However, the Inspectorate seeks assurances as to the detail of such measures that would be employed and how they would be secured and therefore considers that this detail should be described within the ES.		construction activities on or adjacent to landfills and other potentially contaminated sites. Additional detail on the legislation and environmental measures, including how they will be employed and secured, has been included in Chapter 25: Ground conditions, Section 25.4 and will be included in the ES.
5.7.2	In relation to construction vehicle and equipment maintenance and storage of fuels/oils for construction vehicles and equipment (accidental spillages and leaks resulting in ground contamination and risks to human health) being scoped out: "The Inspectorate considers that given the nature of the development the conclusion is reasonable and therefore agrees that these matters can be scoped out of the assessment. This is based on the justification that any maintenance would be subject to The Construction (Design and Management) (CDM) Regulations 2015 and safe working practices as part of normal construction health and safety management under the Health and Safety at Work Act (1974) and regulations made under the Act.	Ground conditions	Acknowledged agreement to scope out effects from accidental spillages and leaks resulting in ground contamination and risks to human health during construction activities. Additional detail on the legislation and environmental measures, including how they will be employed and secured, has been included in Chapter 25, Section 25.4 and will be included in the ES.
ID	PINS comments	Aspect	How this has been addressed in this PEIR
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	The Inspectorate agrees that, with the implementation of measures to limit any potential pollution incidents, any potential impacts on ground conditions are unlikely to result in significant effects and therefore further assessment is not required. However, the Inspectorate seeks assurances as to the detail of such measures that would be employed and how they would be secured and therefore considers that this detail should be described within the ES."		
5.7.3	The Inspectorate considers that given the nature of the development the conclusion is reasonable and therefore agrees that these matters can be scoped out of the assessment.	Ground conditions	Acknowledged agreement to scope out effects from accidental spillages and leaks resulting in ground contamination and risks to human health during operational activities.
5.7.4	The Inspectorate considers that given the nature of the development (and likely activities during decommissioning) the conclusion is reasonable and therefore agrees that these matters can be scoped out of the assessment.	Ground conditions	Acknowledged agreement to scope out effects from exposure to contamination via direct contact, inhalation and/or ingestion of soils and dusts resulting in health effects during decommissioning activities.
5.7.5	The Inspectorate considers that given the nature of the development (and likely activities during decommissioning) the conclusion is reasonable and therefore agrees that these matters can be scoped out of the assessment.	Ground conditions	Acknowledged agreement to scope out effects from accidental spillages and leaks resulting in ground contamination and risks to human health during decommissioning activities.

ID	PINS comments	Aspect	How this has been addressed in this PEIR
5.7.6	The Inspectorate notes that the study area proposed is provisional and will be reviewed and amended in response to such matters as refinement of the onshore components, the identification of additional impact pathways and in response, where appropriate, to feedback from consultation. The Inspectorate welcomes this approach and recommends that the ES should clearly define the chosen study area and provide a justification in support of its suitability.	Ground conditions	The ES will present the updated study area based on final onshore cable corridor and onshore substation location using the criteria presented in Chapter 25, Section 25.4 . The study area used for this PEIR is shown on Figure 25.1, Volume 3 and is based on these principles and the latest onshore cable corridor and onshore substation search areas.
5.7.7	Table 6.8.6 of the Scoping Report sets out the data sources to be used to inform the baseline assessment. Effort should be made to agree the desk-based study area and need for site surveys (as may be necessary according to the desk study outcomes) with relevant consultation bodies.	Ground conditions	Informal consultation was undertaken with stakeholders as detailed in Chapter 25 , paragraph 25.3.5 to 25.3.11 and included discussion of the study area and intention to carry out a site inspection of key locations prior to the ES to support the desk study. Further consultation will be undertaken with stakeholders prior to the ES as detailed in Section 25.16 .
5.7.8	The Inspectorate notes the reference to the simple and detailed assessments which are 'analogous' to the stages of Land Contamination Risk Management (LCRM). The impact assessment should also include detailed and site-specific assessments to demonstrate that the risks to groundwater are acceptable, particularly in those areas identified as of greatest risk. Effort should be made to agree the approach to the assessment, including the simple and detailed assessment	Ground conditions	The assessment presented in the desk study which supports this PEIR (Appendix 25.1: Phase 1 Geo-environmental desk study, Volume 4) identifies where more detailed site- specific assessments are required. Informal consultation was undertaken with stakeholders as detailed in Chapter 25, paragraph 25.3.5 to 25.3.11 and included discussion of assessment methodology. Further



ID	PINS comments	Aspect	How this has been addressed in this PEIR
	methodology and site-specific surveys, with the relevant consultation bodies, including the EA.		consultation will be undertaken with stakeholders prior to the ES as detailed in Chapter 25 , Section 25.16 .
5.7.9	The Inspectorate notes that the term Conceptual Site Model (CSM) is included within the acronyms listed in the Scoping Report. However, there is no reference to a CSM within the Ground Condition section of the Scoping Report. The Applicant should seek to agree the scope of and coverage of any CSM with the EA and other relevant consultation bodies, as appropriate.	Ground conditions	Reference to Conceptual Site Model (CSM) in the PEIR has been included in Chapter 25 . Informal consultation was undertaken with stakeholders as detailed in Chapter 25 , paragraph 25.3.5 to 25.3.11 and included discussion of the scope of the assessment, the baseline data and the CSM. Further consultation will be undertaken with stakeholders prior to the ES as detailed in Section 25.16 .
5.7.10	The ES should include specific consideration of any preferential pathways for pollution and contaminants that may be created as a result of the Proposed Development.	Ground conditions	Consideration of preferential pathway creation has been included as part the assessment of effects presented in Chapter 25, Section 25.9 and will also be included as part of the ES.
5.8	Historic environment		
5.8.1	The Inspectorate agrees that effects on heritage assets	Historic	Acknowledged.
	corridor can be scoped out of the assessment, particularly based on:	environment	Only heritage assets within 1km of the PEIR Assessment Boundary comprising the onshore temporary cable corridor and landfall, and within 2km of the PEIR Assessment Boundary

ID	PINS comments	Aspect	How this has been addressed in this PEIR
	 The temporary and transient nature of onshore construction (and decommissioning) works; and The limited nature of the visual effects during operation as a result of the landfall area (transition bays etc). This does not include scoping out effects of the substation on the same basis (which should be included where significant effects could occur). This also includes the connection to the existing Bolney substation, particularly given that an overhead line connection does not appear to have been expressly ruled out by the Applicant). 		comprising the onshore substation search areas will be considered for effects arising through changes to setting of heritage assets (Chapter 26, Section 26.4 and Figure 26.1, Volume 3). Where the Proposed Development connects into the existing National Grid substation at Bolney, this will be via buried cable.
5.8.2	The Inspectorate agrees that direct effects on assets outside of the scoping boundary can be scoped out of further assessment as there is no pathway for such direct effects	Historic environment	Acknowledged. The same logic is applied at PEIR whereby heritage assets outside of the PEIR Assessment Boundary are scoped out as there is no pathway for such direct effects.
5.8.3	Noting the comments in box 5.8.4 below, the 'extended study area' has yet to be defined. Whilst the Inspectorate agrees with the logic and notes the intention to refine and agree this 'extended study area' to capture potential effects of the Proposed Development as necessary, the Inspectorate cannot agree to this being scoped out of the assessment as it's spatial extent is yet to be defined.	Historic environment	Acknowledged. Since the refinement of the PEIR Assessment Boundary, extended study areas have been determined for the purposes of assessing the settings effects as a result of the onshore development elements of the Proposed Development. These extend 2km from the substation search areas and 25km from the Area



ID	PINS comments	Aspect	How this has been addressed in this PEIR
			of Search (see Chapter 26, Section 26.4 and Figure 26.1, Volume 3).
5.8.4	Where an 'extended study area' will be used to identify heritage assets (to be determined through consultation with stakeholders and not purely based on an "arbitrary 5km or 10km boundary"), the definition and rationale for the selection of areas and relevant assets rather than simply the study area should be clearly explained.	Historic environment	Acknowledged. The rationale for determining the extended study areas and seascape study area is provided on Chapter 26 , Section 26.4 .
5.8.5	Paragraphs 2.4.20, 6.9.37 and 6.9.38 explain that Palaeolithic remains and deposits, as well as elements of a Bronze Age rural landscape, have been exposed by coastal erosion close to the landfall location at Climping. The Inspectorate therefore considers that the area has high archaeological potential (and Historic England highlight the possibility for discovery of remains of national importance). The ES should provide an assessment of significance of effects on these undesignated archaeological remains and how this is taken into consideration as part of the overall selection process for the landfall area (and onshore route).	Historic environment	An onshore historic environment desk study has been prepared to inform the PEIR assessment (Appendix 26.2: Historic environment baseline report, Volume 4). Further investigations to establish archaeological and geoarchaeological potential planned for ES.
5.8.6	Table 6.9.1 does not include a valuation for non- designated remains of national importance. On the basis of the information in that table, the Inspectorate understands that they would be classified as "high"	Historic environment	For the purposes of assessing the significance of effects, Chapter 26, Table 26-20 details the four classes of heritage significance (or sensitivity).



ID	PINS comments	Aspect	How this has been addressed in this PEIR
	sensitivity and the ES should consider the assessment of significance of effects on this basis.		Non-designated remains of national importance are included under "high" heritage significance.
5.8.7	Section 6.9 of the Scoping Report is focused on only impact of the onshore works on heritage assets within the onshore works boundary. Limited information is provided in terms of assessment methodology of the potential impact of the offshore works on the settings of onshore heritage assets (which is not explicitly covered in the marine archaeology aspect chapter). The ES should present specific consideration of the potential for significant effects from offshore works during construction and operation on the setting of onshore assets (noting overlap with LVIA and SLVIA aspects).	Historic environment	Assessment scope and methodology of the potential impact of the offshore works on the settings of onshore heritage assets is provided at PEIR in Chapter 26, Section 26.4 and 26.8 . At ES stage, the assessment will consider the potential for significant effects from offshore works during construction and operation on the setting of onshore assets.
5.9	Water environment		
5.9.1	The Inspectorate agrees that as a result of the limited land disturbance during the earthworks associated with the landfall-cable it is unlikely for such activities to culminate in significant effects on groundwater levels. This is also the case in respect of disturbance during the operational and decommissioning stages. The Inspectorate agrees that this matter can be scoped out of the assessment, with the exception of the proposed substation. The ES will assess the potential for significant effects on groundwater levels from the proposed substation as set out in Table 6.10.11	Water environment	Onshore substation potential effects and also all effects on groundwater quality are retained in the preliminary assessment of effects. In addition to this potential effect from the onshore temporary construction corridor on groundwater levels have been scoped back in, in response to the stakeholder request. This assessment is presented in Chapter 27 , Sections 27.9 to 27.11 .



ID	PINS comments	Aspect	How this has been addressed in this PEIR
	However, the Inspectorate expects the ES will include an assessment of potential effects on groundwater quality during all phases and covering all aspects of the Proposed Development where significant effects are likely to occur.		
5.9.2	The Scoping Report does not clearly identify the locations where the cable may cross below or run near a river. This should be detailed in the ES. Site-specific assessments for each location should also be undertaken to inform the cable crossing techniques at each main river and where significant effects may occur. Any mitigation and/or design measures relied upon for the purposes of the assessment should be explained in the ES and appropriately secured. Effort should be sought to agree proposed mitigation and reinstatement measures with the relevant consultation bodies.	Water environment	A crossing schedule is provided in Appendix 4.2: Crossing schedule, Volume 4 which identifies the technique for crossing of each watercourse. As outlined in commitment C-5 all main watercourses will be crossed by HDD or other trenchless technology where this represents the best environment solution and is financially and technically feasible. A preliminary assessment of effects from watercourses crossings is carried out for these watercourses within this chapter in Chapter 27, Sections 27.9 to 27.11, together with the provision of appropriate embedded environmental measures in Section 27.7. These measures will be further developed as the Proposed Development progresses and the design becomes further refined.
5.9.3	The assessment in the ES should take into account the potential impacts of climate change using the latest UK Climate Projections (UKCP18). Effort should be made to agree the climate change model and future flood risk	Water environment	The future baseline accounting for climate change is presented in Chapter 27, Section 27.6 of this chapter, and the Flood Risk Screening Report presented in Appendix 27.2: Flood Risk



ID	PINS comments	Aspect	How this has been addressed in this PEIR
	allowance baseline with relevant consultation bodies including the EA and lead local flood risk authority		Screening Assessment, Volume 4 has identified the need to take into account the issue of resilience to flooding and other aspects of climate change. At the ES stage, the Flood Risk Assessment (FRA) will further address issues of flood vulnerability resilience.
5.9.4	The ES should clearly include in the baseline, a description of existing (and where relevant, proposed) flood defences or flood alleviation measures that could be impacted or required by the Proposed Development.	Water environment	The existing flood defences and future options are described in the Flood Risk Screening Assessment provided in Appendix 27.2, Volume 4 and summarised within Chapter 27, Section 27.6. An FRA will be carried out at the ES Stage and will include an assessment of all flood effects and required embedded environmental measures.
5.9.5	Where site specific mitigation measures are to be implemented, the ES should describe the mitigation clearly. The ES should also outline how the mitigation measures will be secured through the DCO or other legal mechanism.	Water environment	The provision of appropriate embedded environmental measures is outlined in Chapter 27, Section 27.7 .
5.9.6	The Inspectorate notes that little consideration has been given to any potential effects of the Proposed Development on marine water quality specifically (only by proxy in terms of it's bearing on benthic and fish ecology, coastal processes and other relevant aspects). Paragraph 6.10.3 sets out that the study area will	Water environment	The assessment on marine water quality falls within the remit of Chapter 6 and Chapter 14 , as the receptors are offshore and not land-based. Within this chapter in the preliminary assessment (Chapter 27, Sections 27.9 to 27.11), potential effects from land-based activities at the proposed



ID	PINS comments	Aspect	How this has been addressed in this PEIR
	encompass surface water bodies (river and transitional) and groundwater bodies but not coastal bodies. The ES should include any potential impacts of the works on marine water and sediment quality, particularly with regard to the two designated in proximity of the proposed cable corridor and landfall site (including cross reference to any standalone WFD assessment and other relevant aspect chapters of the ES). The Inspectorate has also made comments to this effect in section 4.10 of this Opinion in respect of the proposed nature conservation aspect chapter.		landfall are considered on the Coastal Sussex Water Framework Directive (WFD) water body. A preliminary WFD assessment has been provided in Appendix 27.3: WFD Assessment, Volume 4 for all WFD bodies under consideration. At the ES stage this document will be developed and refined subject to any further changes in the ongoing design evolution.
6	INFORMATION SOURCES	General	N/A (no response required)
6.0.1	The Inspectorate's National Infrastructure Planning website includes links to a range of advice regarding the making of applications and environmental procedures, these include:	General	This comment is acknowledged. The Planning Inspectorate advice notes have been referred to throughout the development of the Proposed Development.
	 Planning Inspectorate advice notes: 		
	 Framming inspectorate advice notes. Advice Note Three: FIA Notification and 		
	Consultation;		
	 Advice Note Four: Section 52: Obtaining information about interests in land (Planning Act 2008); 		

ID	PINS comments	Aspect	How this has been addressed in this PEIR
	 Advice Note Five: Section 53: Rights of Entry (Planning Act 2008); 		
	 Advice Note Seven: Environmental Impact Assessment: Process, Preliminary Environmental Information and Environmental Statements; 		
	 Advice Note Nine: Using the 'Rochdale Envelope'; 		
	 Advice Note Ten: Habitat Regulations Assessment relevant to nationally significant infrastructure projects (includes discussion of Evidence Plan process); 		
	 Advice Note Twelve: Transboundary Impacts; 		
	 Advice Note Seventeen: Cumulative Effects Assessment; and 		
	 Advice Note Eighteen: The Water Framework Directive. 		
6.0.2	Applicants are also advised to review the list of information required to be submitted within an application for Development as set out in The Infrastructure Planning (Applications: Prescribed Forms and Procedures) Regulations 2009.	General	This comment is acknowledged.

4.5.2



Volume 4, Appendix 5.2

Greenhouse gas assessment





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1. Introduction

1.1 Overview

- 1.1.1 This appendix is provided in support of the Preliminary Environmental Information Report (PEIR) for Rampion 2. It should be read in conjunction with the description of the Proposed Development provided in the **Chapter 4: The Proposed Development, Volume 2** of the PEIR.
- 1.1.2 Rampion Extension Development Limited (RED) submitted a Scoping Report (RED, 2020) and request for a Scoping Opinion to the Secretary of State (SoS) (administered by the Planning Inspectorate (PINS)) on 2 July 2020 (RED, 2020). A Scoping Opinion was received on 11 August 2020 (The Planning Inspectorate, 2020). In paragraph 3.3.22 of the Scoping Opinion, the following comment was received in relation to climate change:

"Climate and Climate Change

The ES should include a description and assessment (where relevant) of the likely significant effects the Proposed Development has on climate (for example having regard to the nature and magnitude of greenhouse gas emissions) and the vulnerability of the project to climate change. Where relevant, the ES should describe and assess the adaptive capacity that has been incorporated into the design of the Proposed Development. This may include, for example, alternative measures such as changes in the use of materials or construction and design techniques that will be more resilient to risks from climate change."

- 1.1.3 In response to paragraph 3.3.22 of the Scoping Opinion (The Planning Inspectorate, 2020), this appendix provides a description and preliminary assessment of the effects the Proposed Development has on climate with regards to greenhouse gas (GHG) emissions during the construction, operation and maintenance and decommissioning phases of the Proposed Development.
- 1.1.4 The vulnerability of the Proposed Development to climate change has been considered elsewhere in the PEIR. Baseline data, details of the policy requirements of relevance to the vulnerability of the Proposed Development to climate change and details of climate resilience principles in the design are described in Appendix 5.5. Vulnerability to climate change policy and baseline, Volume 4. Consideration to climate change has been included in Chapters 6 28, Volume 2, where relevant. Environmental measures have been incorporated into the design and are described within all relevant chapters in the PEIR Volume 2 (including Appendix 27.2: Flood Risk Screening Assessment, Volume 4). Further evolution of the design of the Proposed Development will be reported in documentation supplied for at ES and DCO Application stage (including the Design and Access Statement and the Deemed marine licence).
- 1.1.5 GHG emissions are used as a measure and indicator of the Proposed Development's impact on climate. The increase in concentration of GHG emissions in the global atmosphere is causing a change in climatic conditions and

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creating climate change impacts. Any GHG emissions arising as a result of the Proposed Development will therefore have an impact on climate change.

- 1.1.6 The approach to assessing GHG emissions from the construction, operation and maintenance and decommissioning phases of the Proposed Development has been undertaken in line with Institute of Environmental Management and Assessment (IEMA) guidance for assessing GHG emissions and therefore considers the following two scenarios:
 - a do-minimum scenario where the Proposed Development is not built; and
 - a do-something scenario where the Proposed Development with embedded environmental measures is built.

1.2 Structure of this appendix

- 1.2.1 The remainder of this appendix is structured as follows:
 - Section 2: Relevant legislation, planning policy and other information and guidance;
 - Section 3: Assessment methodology;
 - Section 4: Estimation of GHG emissions;
 - Section 5: Preliminary assessment of GHG emissions;
 - Section 6: Glossary of terms and abbreviations; and
 - Section 7: References.
- 1.2.2 This appendix is supported by the following annex:
 - Annex A: Supporting Data for the GHG assessment.

2. Relevant legislation, planning policy and other information and guidance

2.1 Legislative context

- 2.1.1 Key legislation relevant to the GHG emissions assessment, and which may influence the type of environmental measures that could be incorporated into the Proposed Development during the construction, operation and maintenance and/or decommissioning phases includes:
 - *Climate Change Act 2008 (2050 target amended)* (The UK Government, 2019) is the core legislation that is of relevance to this assessment. The Act sets a target to ensure that the net UK carbon account for the year 2050 is at least 100% lower than the 1990 baseline ('the UK carbon target'). The UK carbon target is now often referred to as 'net zero'.

The Climate Change Act 2008 also created a framework for setting a series of interim national carbon budgets and plans for national adaptation to climate risks. At present the Third, Fourth and Fifth Carbon Budgets, set through The Carbon Budget Orders 2009, 2011 and 2016, are 2.54 gigatonnes of carbon dioxide equivalent¹ (GtCO₂e) for 2018-2022, 1.95 GtCO₂e for 2023-2037 and 1.73 GtCO₂e for 2028-2032. Recommendations endorsed by the Government and accompanying legislative/policy requirements to meet the carbon budgets have been factored into the GHG assessment.

The Climate Change Committee (CCC) recently provided advice on setting the Sixth Carbon Budget (advised to be 965 megatonnes of CO₂e (MtCO₂e) for 2033 to 2037) which it states, "*would decisively commit the UK to the transition to Net Zero emissions in 2050*" (CCC, 2020a). The Government will set the total Sixth Carbon Budget in line with CCC recommendations (UK Government, 2021) with the new target enshrined in law by the end of June 2021. This budget has therefore been included in the PEIR GHG assessment.

 The Energy Act (2013) outlines the UK's commitment to a low carbon energy industry and investment in low carbon electricity generation (The UK Government, 2013). The Act establishes the legislative framework to enable secure, affordable and low carbon energy. It includes provisions for: decarbonisation, allowing the Secretary of State to set a 2030 decarbonisation target range for electricity in secondary legislation; and Electricity Market Reform (EMR), with measures to attract investment that encourage low carbon electricity generation.

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¹ GHG emissions are quantified as carbon dioxide equivalent (CO₂e) which is a term for describing different GHGs in a common unit. For any quantity and type of GHG, CO₂e represents the amount of CO₂ which would have the equivalent global warming impact. In published literature and policy documents, GHG emissions are sometimes referred to as "carbon emissions" by shorthand. In this assessment, this term has been avoided and GHG emissions refer to CO₂e emissions while CO₂ emissions refer only to CO₂.

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 Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (The UK Government, 2017). These regulations transposed the requirements of the EIA Directive 2014/52/EU into UK law. This introduced climate as a topic for environmental assessment, including a description of the likely significant effects resulting from the impact of the Proposed Development on climate (for example the nature and magnitude of GHG emissions).

2.2 Planning policy context

2.2.1 There are a number of policies and guidance documents at an international, national and local level that are relevant to the GHG assessment, listed in **Table 2-1**.

Reference	Policy issue
International planning p	oolicies
The United Nations Framework Convention on Climate Change (UNFCCC) Paris Agreement (UNFCCC, 2015)	The UNFCCC is the major international body responsible for managing climate change and GHG emissions. In 2015, it adopted the Paris Agreement, the aims of which are stated as: " <i>This Agreement, in enhancing the implementation of the</i> <i>Convention, including its objective, aims to strengthen the global</i> <i>response to the threat of climate change, in the context of</i> <i>sustainable development and efforts to eradicate poverty,</i> <i>including by:</i> (a) Holding the increase in the global average temperature to well below 2 °C above pre-industrial levels and to pursue efforts to limit the temperature increase to 1.5 °C above pre-industrial levels, recognizing that this would significantly <i>reduce the risks and impacts of climate change; and (b)</i> <i>Increasing the ability to adapt to the adverse impacts of climate</i> <i>change and foster climate resilience and low greenhouse gas</i> <i>emissions development, in a manner that does not threaten food</i> <i>production</i> " (Art. 2).
	The agreement sets targets for countries' GHG emissions, but these are not legally binding or enforceable. The UK's Nationally Defined Contribution (NDC) commits the UK to reducing economy-wide GHG emissions by at least 68% by 2030, compared to 1990 levels (Department for Business, Energy and Industrial Strategy (BEIS), 2020). This target has been built upon in the Sixth Carbon Budget, which aims to achieve a 78% reduction in GHG emissions by 2035. This budget is due to be enshrined in UK law by the end of June 2021 and is used for contextualisation in the GHG assessment.

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Reference	Policy issue
UNFCCC Kyoto Protocol (UNFCCC, 1997)	The Kyoto Protocol was adopted in December 1997 and there are currently 192 Parties to the Kyoto Protocol. It commits industrialised countries and economies to transition to limit and reduce GHG emissions in accordance with agreed individual targets. These have been strengthened in more recent international agreements culminating in the Paris Agreement (UNFCCC, 2015), as described above.
	The Kyoto Protocol contains a list of seven GHG to be reported, which remains relevant in the Paris Agreement, namely: carbon dioxide (CO ₂), methane (CH ₄), nitrous oxide (N ₂ O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), sulphur hexafluoride (SF ₆), and nitrogen trifluoride (NF ₃). In this GHG assessment, these seven GHG are collective considered "GHG emissions" and reported as carbon dioxide equivalent (CO ₂ e) GHG emissions.

National planning policies

National Planning Policy Framework (NPPF) (Ministry of Housing, Communities and Local Government, 2019)	The NPPF acts as policy for local planning authorities and decision-makers, both for developing plans and making decisions about planning applications. It is applicable to onshore developments rather than offshore and has been used to guide the GHG assessment for the Proposed Development. The policy related to low-carbon development has been used to inform the GHG assessment and design of the Proposed Development.
	In Paragraph 148, the revised NPPF from 2019 states: "The planning system should support the transition to a low carbon future in a changing climate []. It should help to: shape places in ways that contribute to radical reductions in greenhouse gas emissions [] and support renewable and low carbon energy and associated infrastructure".
	In Paragraph 150, it requires that new development should be planned for in ways that "can help to reduce greenhouse gas emissions, such as through its location, orientation and design".
	In Paragraph 151, it comments that to help increase the use and supply of renewable and low carbon energy and heat, plans should: "a) provide a positive strategy for energy from these sources, that maximises the potential for suitable development, while ensuring that adverse impacts are addressed satisfactorily (including cumulative landscape and visual impacts); b) consider identifying suitable areas for renewable and low carbon energy sources, and supporting infrastructure, where this would help secure their development".
	In Paragraph 153, it is stated that local planning authorities should expect new development to: "a) comply with any development plan policies on local requirements for

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Reference	Policy issue
	decentralised energy supply unless it can be demonstrated by the applicant, having regard to the type of development involved and its design, that this is not feasible or viable; and b) take account of landform, layout, building orientation, massing and landscaping to minimise energy consumption." Furthermore, in Paragraph 154, it identifies that when determining planning applications for renewable and low carbon development in an onshore setting, local planning authorities should: "a) not require applicants to demonstrate the overall need for renewable or low carbon energy []; and b) approve the application if its impacts are (or can be made) acceptable*. Once suitable areas for renewable and low carbon energy have been identified in plans, local planning authorities should expect subsequent applications for commercial scale projects outside these areas to demonstrate that the proposed location meets the criteria used in identifying suitable areas." *The following footnote is included in the NPPF with reference to Paragraph154 b) regarding wind energy development: "Except for applications for the repowering of existing wind turbines, a proposed wind energy development involving one or more turbines should not be considered acceptable unless it is in an area identified as suitable for wind energy development in the development plan; and, following consultation, it can be demonstrated that the planning impacts identified by the affected local community have been fully addressed and the proposal has their backing."
The Ten Point Plan for a Green Industrial Revolution (HM Government, 2020)	This plan sets out the UK Government's approach to "build back better" following the impacts of the COVID-19 pandemic in 2020. It includes details of how the Government intend to accelerate the path to net zero in line with the commitment made in the Climate Change Act 2008 (amended) (The UK Government, 2008). <i>"Advancing Offshore Wind"</i> is Point 1 of the 10 Point Plan, commenting that offshore wind is a critical source of renewable energy for the UK's growing economy, and stating that <i>"By 2030 we plan to quadruple our offshore wind capacity</i> [] <i>by 2030, we aim to produce 40GW of offshore wind"</i> . The plan also makes reference to the forthcoming Energy White Paper and the Offshore Transmission Network Review, which will set out strategies to connect offshore wind in a clean and cost-effective way to onshore networks, and the need for smart technologies and additional development of network infrastructure. This plan is therefore relevant to the contextualisation of the GHG assessment within the national policy context.

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Reference	Policy issue
The National Infrastructure Strategy (HM Treasury, 2020)	The National Infrastructure Strategy, published on 25 November 2020, sets out actions that the Government will take to build infrastructure needed to achieve net zero GHG emissions by 2050. One of the key measures identified in the strategy for decarbonising the economy and adapting to climate change, includes making a significant investment in offshore wind. Consistent with the target to achieve 40GW of offshore wind by 2030, the Government expects that around 65% of electricity generated in Great Britain to come from renewable sources by 2030. This plan is therefore relevant to the contextualisation of the GHG assessment within the national policy context.
UK Marine Policy Statement (HM Government, 2011)	In Paragraph 2.6.7.6, the Marine Policy Statement states that marine planning including offshore renewables "has an important role to play in facilitating climate change mitigation". In Paragraph 3.3.4, the Policy states that decision makers examining and determining applications for energy infrastructure should take into account "the positive wider environmental, societal and economic benefits of low carbon electricity generation as key technologies for reducing carbon dioxide emissions".
National Policy Statement for Energy EN-1 (Department for Energy and Climate Change, 2011)	The NPS EN-1 sets out the national policy for energy infrastructure. The NPS describes the energy sector's role in delivering the Government's climate change objectives " <i>by</i> <i>clearly setting out the need for new low carbon energy</i> <i>infrastructure to contribute to climate change mitigation</i> ". It should be noted that at the time of writing the NPS the UK's climate commitment was a target of 80% reduction relative to the 1990 baseline but this has since been updated to 100%.
Clean Growth Strategy (BEIS, 2017)	Provides the strategy for the UK's future clean growth to allow Carbon Budgets required by the Climate Change Act 2008 (amended) (The UK Government, 2008) to be met and support economic growth. The strategy sets out policies and targets out to 2050 for reducing GHG emissions across a number of sectors.
	The strategy focuses on accelerating clean growth, improving business and industry inefficiency, improving the energy efficiency of homes, rolling out low carbon heating, accelerating the shift to low carbon transport, delivering clean, smart, flexible power, enhancing the benefit and value of our natural resources and leading in the public sector and government. This plan is therefore relevant to the contextualisation of the GHG assessment within the national policy context.

Local planning policies (onshore)

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Reference	Policy issue
Arun Local Plan 2011-2031 (Arun District Council, 2018)	In the Arun Local Plan, the Council comments that it will support proposals which contribute to both mitigating and adapting to climate change and to meeting the national targets to reduce GHG emissions, although it is noted that policies in the Local Plan on Climate Change, Energy Efficiency and Renewable Energy will primarily relate to the onshore elements of the Proposed Development. The Local Plan includes Policy ECC DM1 Renewable Energy, which states that <i>"The Council will support renewable energy development subject to the criteria in this Policy. Schemes will be expected to contribute to the social, economic and environmental development and overall regeneration of the District." This plan is therefore relevant to the contextualisation of the GHG assessment within the local policy context.</i>
Horsham District Planning Framework 2015 (Horsham District Council, 2015)	The Planning Framework identifies key objectives to fulfil the vision for the Horsham district, which includes Spatial Objective 12: "Ensure that new development minimises carbon emissions, adapts to the likely changes in the future climate and promotes the supply of renewable, low carbon and decentralised energy." This is supported by Strategic Policy 35: Climate Change, which includes the following statements: "Development will be supported where it makes a clear contribution to mitigating and adapting to the impacts of climate change and to meeting the district's carbon reduction targets as set out in the Council's Acting Together on Climate Change Strategy, 2009." "Measures which should be used to mitigate the effects of climate change include: 1. Reduced energy use in construction". This plan is therefore relevant to the contextualisation of the GHG assessment within the local policy context.
Draft Horsham District Local Plan 2019-2036 (Horsham District Council, 2019)	The Draft Local Plan includes Strategic Policy 37 - Climate Change proposing measures that will be required for developments to mitigate the impact of climate change, including: <i>Carbon reduction</i> , by reducing the amount of energy used in construction and operation of new buildings, including through the materials used in construction. This plan is therefore relevant to the estimation of the GHG emissions within the GHG assessment.
Mid-Sussex District Plan 2014-2031 (Mid-Sussex District Council, 2018)	The District Plan includes a Strategic Objective <i>"To promote development that makes the best use of resources and increases the sustainability of communities within Mid Sussex, and its ability to adapt to climate change".</i> This plan is therefore relevant to the estimation of the GHG emissions within the GHG assessment.

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Reference	Policy issue	
South Downs National Park Local Plan (South Downs National Park, 2019)	The South Downs Local Plan covers the entire South Downs National Park and gives consideration to the impact of climate change on the National Park. Strategic Policy 48: Climate Change and Sustainable Use of Resources of the South Downs National Park Local Plan calls for new developments to incorporate sustainable design features. Strategic Policy 51: Renewable Energy supports development proposals for renewable energy schemes that "contribute towards reducing greenhouse gas emissions and moving towards a carbon neutral National Park". This Local Plan is therefore relevant to the estimation of the GHG emissions within the GHG assessment.	
Local planning policies (offshore)		
South Inshore and South Offshore Marine Plan	The South Inshore and South Offshore Marine Plan covers an area of around 20,000 km ² of inshore and offshore waters across 1,000km of coastline from Folkestone to the river Dart. Objective 7 of the plan is "to support the reduction of the environmental, social and economic impacts of climate change, through encouraging the implementation of mitigation and adaptation measures". This Marine Plan is therefore relevant to the estimation of the GHG emissions within the GHG assessment.	

2.3 Other information and guidance

2.3.1 **Table 2-2** lists guidance documents which are relevant to the GHG assessment.

Table 2-2 Technical guidance relevant to the GHG assessment

Guidance	Relevance	
Carbon management standards and guidance		
The Greenhouse Gas Protocol A Corporate Accounting and Reporting Standard (GHG Protocol) (World Business Council for Sustainable Development (WBCSD) and World Resources Institute (WRI), 2014)	Provides standards and guidance for preparing a GHG emissions inventory. This guidance has been followed in developing the assessment methodology for the GHG assessment.	

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Guidance	Relevance
Publicly Available Standard (PAS 2080): 2016 – Carbon Management in Infrastructure (British Standards Institution (BSI), 2016)	Provides an approach to management of reduction of GHG emissions from infrastructure projects, working with stakeholders throughout the project lifecycle. This guidance has been followed in developing the assessment methodology for the GHG assessment.
Institute of Environmental Management and Assessment (IEMA) Environmental Impact Assessment Guide to: Assessing Greenhouse Gas Emissions and Evaluating their Significance (IEMA, 2017)	Current IEMA principles and guidance state that due to the combined environmental effect that is approaching a scientifically defined limit, any GHG emissions or reductions from a project might be considered to be significant. The IEMA guidance goes on to state that an Environmental Impact Assessment (EIA) should therefore ensure the project addresses its GHG emissions occurrence by taking mitigating action. This guidance has been followed in developing the assessment methodology for the GHG assessment and considered in the preliminary assessment of GHG emissions.
IEMA Principles Series: Climate Change Mitigation & EIA (IEMA, 2010)	
Guidance from govern	ment statutory bodies
Committee on Climate Change (CCC), Net Zero. The UK's contribution to stopping global warming (CCC, 2019)	The report responds to a request from the UK governments to provide updated advice on the UK's long-term GHG emission target, including the possibility of setting a "net-zero" target, following recent Intergovernmental Panel on Climate Change (IPCC) reports (IPCC, 2018). The report suggests that the UK "should set and vigorously pursue an ambitious target to reduce greenhouse gas emissions (GHGs) to 'net-zero' by 2050".
	The reports comments that many of the changes to continue reducing electricity GHG emissions will occur on the supply side (e.g. more deployment of offshore wind). It suggests that strong deployment of low-carbon generation will be needed in order to quadruple low-carbon supply by 2050 (e.g. including at least 75 GW of offshore wind). It also highlights the need for the transmission network capacity to keep pace with developments on generation (e.g. large-scale offshore wind) and interconnections, and with the need to ensure that peak demand can be met reliably in all areas on still days as well as

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Guidance	Relevance
	on windy days. This plan is therefore relevant to the contextualisation of the GHG assessment within the national policy context.
Committee on Climate Change: Reducing UK emissions 2020 Progress Report to Parliament (CCC, 2020b)	This report sets out the UK's progress against GHG emissions reduction targets to 2050. The Progress Report is updated annually. The report confirms that power sector plans are advancing in line with the large scale required for the net-zero target, including acknowledgement that the Government's ambition for offshore wind generation by 2030 has increased from 30 GW to 40 GW. The report also suggests there is potential for more than 75 GW of offshore wind farms to be operational by 2050 and identifies the urgent need to provide for more orderly and cooperative processes for connecting offshore wind to the national grid when it reaches the shore. This plan is therefore relevant to the contextualisation of the GHG assessment within the national policy context.

3. Assessment Methodology

3.1 Introduction

- 3.1.1 This section outlines the methodology used to quantify GHG emissions and assess the likely significant effects of the Proposed Development for the identified scenarios during the construction, operation and maintenance and decommissioning phases.
- 3.1.2 The approach to determining the scale of GHG emissions associated with the Proposed Development has been undertaken in line with IEMA guidance 2017 (IEMA, 2017) for assessing GHG emissions and the principles defined in the Publicly Available Specification 2080: Carbon Management in Infrastructure (BSI, 2016).
- 3.1.3 To meet the requirements of the IEMA guidance (IEMA, 2017), and in line with the EIA Regulations, two assessment scenarios have been presented:
 - the do-minimum where the Proposed Development is not built and the latest equivalent data for the UK grid average generation intensity is consumed; and
 - the do-something scenario where the Proposed Development with embedded environmental measures is built. The expected policy impacts of the dominimum scenario also underpin this do-something scenario.
- 3.1.4 The key assumptions and results of calculations of GHG emissions from each of these scenarios are described further throughout this appendix and its **Annex A**.

3.2 Spatial scope and receptor

- 3.2.1 The study area for GHG emissions associated with the Proposed Development includes GHG emissions arising from the construction, operation and maintenance and decommissioning phases within the PEIR Assessment Boundary, as well as the GHG emissions associated with material processing and transportation of materials and labour outside of the PEIR Assessment Boundary.
- 3.2.2 This study area is appropriate as it captures the GHG emissions from the Proposed Development's construction, operation and maintenance, and decommissioning activities and materials usage as well as GHG emissions from staff travel and movements associated with materials.
- 3.2.3 GHG emissions have a global effect rather than directly affecting any specific local receptor to which a level of sensitivity can be assigned. The global climate is the only receptor for the climate change assessment.
- 3.2.4 Given the global impacts of climate change and the globally recognised requirement to limit GHG emissions to maintain global average temperature increase below 1.5 2°C, as laid out in the Paris Agreement (UNFCCC, 2015), the receptor is considered highly sensitive to GHG emissions.

3.3 Temporal scope

- 3.3.1 The temporal scope of the GHG assessment considers GHG emissions across the lifetime of the Proposed Development. For the purpose of the GHG emissions assessment timescales for the construction, operation and maintenance, and decommissioning phases of the Proposed Development have been assumed to be between 2025 and 2063 based on information presented in **Chapter 4: The Proposed Development, Volume 2.**
 - construction 2025 2028;
 - operation and maintenance 2029 -2059; and
 - decommissioning 2060 2063.

3.4 Estimation of GHG emissions

Overview

- 3.4.1 GHG emissions have been estimated by applying published GHG emissions factors to activities in the baseline (do-minimum scenario) and to those required for the Proposed Development (do-something scenario). The GHG emissions factors relate a given level of activity, or amount of fuel, energy or materials used, to the mass of GHGs released as a consequence.
- 3.4.2 The GHG emissions sources considered in this assessment span the whole lifetime of the Proposed Development and include:
 - Materials GHG emissions associated with the materials used to construct the Proposed Development including wind turbine generators (WTGs), foundations, onshore and offshore cables, onshore and offshore substations, scour protection and concrete transition joint bays.
 - Transport of materials to site and onshore labour movements GHG emissions associated with the transport of materials, vessels, equipment and workers to onshore and offshore sites by road and sea routes.
 - Construction and installation processes GHG emissions associated with the installation works including onshore on-site plant equipment, and GHG emissions associated with ships used for installation of offshore works, and helicopters associated with offshore worker movements.
 - Operation and maintenance GHG emissions GHG emissions associated with operation and maintenance activities including the embodied carbon of raw materials required for replacement, and offshore vessel and helicopter movements required for operation and maintenance activities.
 - Decommissioning activities GHG emissions associated with onshore and offshore decommissioning activities. This is assumed to generally be the reverse of the construction sequence and involve similar types and numbers of vessels and equipment with some materials left in-situ, as described below.
 - Avoided GHG emissions the GHG emissions avoided from fossil fuel-based energy generation as a result of the Proposed Development.

- 3.4.3 Estimated GHG emissions have been calculated as per the equation below:
 - Activity data x GHG emissions factor = GHG emissions value.
- 3.4.4 All GHG emissions have been reported as kilo-tonnes of carbon dioxide equivalent (ktCO₂e), accounting for the seven GHG included in the UNFCCC/Kyoto Protocol (UNFCCC, 1997).
- 3.4.5 Activity data (material type, quantities required, progress rates, etc.) for each GHG emission source has been primarily based on the details within the current design of the Proposed Development. Where this information was not available due to the design stage, information has been sourced from relevant specialists within the design team and literature studies of comparable projects (including the Rampion 1 offshore wind farm) (see **Annex A**).
- 3.4.6 A proportionate approach has been taken to ensure that undue attention is not placed on GHG emissions sources that have very limited impact on the overall scale of GHG emissions. GHG emission sources that contribute <1% of GHG emission inventories and require onerous data collection have been excluded from the assessment. Details regarding exclusions have been included within **Annex A**.

Construction phase

- 3.4.7 The quantification of GHG emissions arising from the construction phase of the Proposed Development, also referred to as 'construction carbon', was calculated in line with PAS 2080:2016 (BSI, 2016) and GHG emission factors from the sources presented in **Annex A** (i.e. Inventory of Carbon and Energy (ICE) database (ICE, 2019)).
- 3.4.8 The do-minimum (baseline) scenario assumes that there will be no construction activity.
- 3.4.9 Based on knowledge from recent offshore wind farm projects (ClimateXChange, 2015), the largest GHG emissions from the Proposed Development (do-something scenario) are likely to be related to embodied carbon. The embodied carbon describes the carbon footprint of a material, allowing for the sum of the energy required in resource extraction, and any processing required, as well as the transport and supply logistics to the factory gate (prior to transport to the Proposed Development for use), to be accounted for within the overall GHG estimation. Using the estimated material quantities and types, the embodied carbon of the construction material assets is calculated, giving its contribution to the overall GHG emissions from the construction phase.

Operation and maintenance phase

3.4.10 The do-minimum scenario is represented by the existing GHG emissions from the PEIR Assessment Boundary prior to construction and operation of the Proposed Development or by the GHG emissions arising from an alternative project design and assumptions. Since there is no physical development and activity at the location of the Proposed Development in the do-minimum scenario, the GHG emissions from the PEIR assessment prior to construction and operation will be zero. Therefore, for this assessment, the use of other alternative electricity generation methods has been considered.

- 3.4.11 The GHG emissions associated with the do-something scenario is calculated based on the GHG intensity of the Proposed Development (CO₂e/kWh) which measures the GHG emissions of the Proposed Development, measured in CO₂e, relative to the total predicted generation of the Proposed Development, measured in kWh. Operation and maintenance GHG emissions of the Proposed Development relate to activities including vessel and helicopter movements, staff commuting journeys, and material requirements.
- 3.4.12 The annual energy generation from the Proposed Development during the operation and maintenance phase has been calculated using a high-level approach advocated by Renewables UK (Renewables UK, 2021). The installed total offshore wind farm capacity (1,200MW) has been multiplied by the number of hours in the year (8,760, based on 365 days per year) and by the appropriate load or capacity factor for the Proposed Development. An annual availability factor, which accounts for downtime for troubleshooting, maintenance and major corrective works, has been specified.
- 3.4.13 The load factor provides an indication of the ratio of electricity that will realistically be generated as a proportion of the total generating capacity. The load factor will be heavily influenced by weather conditions (i.e. wind speeds). Load factors have been taken from the Digest of United Kingdom Energy Statistics (DUKES) 2020 report (BEIS, 2020b) which considers offshore wind farms in the UK that were generating electricity over the whole period of 2019 outlining a value of 39.6%. Current operational offshore wind farms suggest load factors from 39% to 47% (BEIS, 2019a).
- 3.4.14 It is recognised that there is potential for improved load factors of offshore wind farms in the UK as future technologies become commercially viable. In particular, deployment of next generation offshore WTGs (with capacity equal to or greater than 10MW), together with other technology and operational improvements, are anticipated to result in higher load factors. BEIS provides an anticipated load factor for offshore wind developments delivered between 2023 and 2025 of 58.4% (BEIS, 2019b). This load factor has been used in the GHG assessment as representative of the Proposed Development.
- 3.4.15 The average annual availability factor for the Proposed Development is dependent on the model of WTGs selected at detailed design stage. For the Proposed Development, the larger WTG type is associated with an availability factor of 98.4%.

Decommissioning phase

- 3.4.16 The decommissioning phase of the Proposed Development is assumed to include the decommissioning and removal of all structures above the seabed or ground level. Following the approach set out in **Chapter 4**, **Volume 2**, it has been assumed for the GHG assessment that the wind farm array and export cables are removed, although this will be determined at the time of decommissioning.
- 3.4.17 Decommissioning will occur far into the future and therefore attempting to account for the fate of materials and the activity required for the end-of-life phase are associated with significant uncertainty. GHG emissions are therefore estimated on the assumption that decommissioning will be based on reverse installation and the

assumptions about maximum number of vessels and helicopters and their movements is therefore the same as described for construction of the Proposed Development.

3.5 Assessment criteria

- 3.5.1 GHG emissions from the Proposed Development have been quantified and expressed as ktCO₂e per annum for the do-minimum and do-something scenarios. The difference between the two scenarios has been calculated to provide the evidence of the impact of the Proposed Development on climate from GHG emissions produced during its construction, operation and maintenance, and decommissioning.
- 3.5.2 With regards to GHG emissions there are no recognised likelihood categories in the UK. The information presented has demonstrated the levels of GHG emissions predicted during construction, operation and maintenance and decommissioning against the UK Government's published carbon budgets.

3.6 Key assumptions and limitations

- 3.6.1 It is not known exactly which form of conventional electricity generation the Proposed Development will replace. The preliminary assessment of GHG emissions considers the carbon payback period of the Proposed Development relative to coal, gas, all fossil fuels and all fuels (including nuclear and renewables) generation mechanisms.
- 3.6.2 There are currently no plans or requirements to mitigate GHG emissions for Rampion 2 through offsetting schemes (i.e. peatland restoration, tree planting). It is expected that this will continue to be the case for the Proposed Development, so offsetting has not been considered in the assessment.
- 3.6.3 The approach presented in this appendix does not represent a full life-cycle assessment. At the PEIR stage, many of the specific Proposed Development design elements that will result in GHG emissions have yet to be defined. This includes the WTG make and model, the foundation design, the vessels to be used and the source of many materials. To address these uncertainties, the GHG assessment therefore utilises details from published literature, expert judgement and project-specific aspects where available in the preliminary design. These assumptions are set out in this appendix and **Annex A**. The assumptions may be refined at the ES stage as designs continue to evolve and develop with further information becoming available.
- 3.6.4 As WTG technology is continually evolving, it is difficult to definitively predict the generating capacity and model of WTG that will be commercially available at the point of procurement for construction. As such, the size and capacity of the WTG for the Proposed Development will be determined during the final project design stage prior to construction. The final WTG design will be selected in accordance with the parameters set out in the Development Consent Order (DCO).
- 3.6.5 It is recognised that final WTG design will not be determined until the final design stage of the Proposed Development prior to construction. High-level sensitivity

testing, given available data, has been performed on anticipated GHG emissions for smaller and larger turbines scenarios. In general, the larger turbine scenario is associated with greater GHG emissions from embodied carbon due to greater material volumes being required (for WTG, foundations, scour protection and maintenance) while the smaller turbine scenario is associated with a greater number of marine transport trips due to the greater quantity of turbines. GHG emissions for the Proposed Development are therefore likely be of a similar magnitude, within the margin of error of the assessment, regardless of the final turbine design. The GHG assessment is based on maximum assessment assumptions described for the maximum design scenario as described in **Chapter 4**, **Volume 2** and is therefore based on the larger turbine size.

- 3.6.6 Worse-case scenarios for all other maximum assessment assumptions required for the Proposed Development (i.e., not related to the wind turbine design) have been used in the assessment as per the description in **Chapter 4**, **Volume 2**.
- 3.6.7 At present, best-in-class WTG design has a maximum generating capacity of 14MW. Based on results of a literature assessment, a linear relationship is found between WTG total material balance and key parameters of WTGs, including generating capacity, rotor blade diameter and tower height. This scaling has been used to estimate approximate material quantities for larger turbines considered in the GHG assessment based on available data from Siemens Gamesa SG222 14MW WTG. Material quantities used are presented in **Annex A**.
- 3.6.8 Details of estimated materials required for the components of the onshore substation have been provided for the purposes of the GHG assessment. These are detailed in **Annex A**.
- 3.6.9 All other assumptions made within the GHG assessment are consistent with those stated in **Chapter 4**, **Volume 2** and used in the other assessments. Where necessary these are noted in **Annex A**.

4. Estimation of GHG emissions

4.1 Introduction

4.1.1 The Proposed Development will have a generating capacity of up to 1,200MW. The "GHG intensity" of electricity is a measure of how much GHG emissions are produced per kilowatt hour of electricity consumed. The GHG intensity of the Proposed Development is estimated as per the methodology described in Section 3 and Table 4-1 as 12.7 gCO₂e/kWh. This is comparable to a published GHG intensity for offshore wind farms that range from 7 to 23gCO₂e/kWh, following a harmonisation procedure (ClimateXChange, 2015). The GHG intensity of gas- or coal-fired conventional generation plants are typically estimated to be around 500 and 1,000gCO₂e/kWh respectively (ClimateXChange, 2015).

Table 4-1 Calculation of the GHG intensity of the Proposed Development

Detail	Value
Total generation capacity of the Proposed Development	Up to 1,200MW
Load factor	58.4%
Availability factor	98.4%
Predicted annual generation of the Proposed Development	6,040,784MWh/yr
Predicted lifetime generation of the Proposed Development	181,223,516MWh
GHG footprint of the Proposed Development	2,303,189ktCO2e
GHG intensity of the Proposed Development	12.7gCO ₂ e/kWh

Note: 1 MW is equal to 1,000kW.

4.1.2 Annual energy generated by the Proposed Development is estimated to be approximately 6,040,784MWh per year, and 181,223,516MWh over the lifespan of the Proposed Development of around 30 years.

4.2 **Do-minimum scenario**

- 4.2.1 Energy statistics produced by BEIS and published in DUKES 2020 (BEIS, 2020b) have been used to calculate GHG emissions associated to the do-minimum scenario. Based on provisional data from 2019, estimated CO₂ emissions per unit of electricity generated by all fuel types in the UK grid electricity mix (based substantially on fossil-fuelled generation) are 198tCO₂/GWh.
- 4.2.2 It is assumed that the Proposed Development will displace electricity generation by fossil fuels. If the power output of the Proposed Development (up to

1,200MW/yr) were delivered instead by the current UK grid electricity generation mix, the estimated CO_2 emissions would be approximately 35,882kt CO_2 .

4.2.3 National Statistics data estimates that CO₂ emissions represent around 81% of UK total GHG emissions. Therefore, it has been estimated that the 35,882ktCO₂ will be equivalent to approximately 44,299ktCO₂e.

4.3 **Do-something scenario**

- 4.3.1 The key assumptions and results of calculations of GHG emissions from each of the construction, operation and maintenance, and decommissioning activities included within the GHG assessment are described further throughout this appendix. This section estimates the GHG emissions associated with materials, transport of materials and labour to site, construction and installation processes, operation and maintenance, and decommissioning activities.
- 4.3.2 Projected GHG emissions associated with the Proposed Development have been estimated to be approximately 2,293ktCO₂e. The breakdown of estimated GHG emissions by the different sources is described in **Table 4-2** and further information has been included in **Annex A**.

Phase	GHG emission source	Activity	Estimated GHG emissions (ktCO ₂ e)
Construction	Materials	WTGs	461.2
		WTG foundations	345.1
		Offshore substation	22.4
		Offshore scour protection for WTG and offshore substations	19.2
		Offshore cable protection including cable crossings	39.4
		Inter-array cables	9.8
		Export cables	13.7
		Onshore cable	11.3
		Onshore substation	8.3

Table 4-2 Estimation of GHG emissions associated with the Proposed Development



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Phase	GHG emission source	Activity	Estimated GHG emissions (ktCO ₂ e)
		Onshore Joint Bays	0.4
	Transport of materials to site and onshore labour movements	Offshore vessel movements	101.6
		Onshore HGV movements	3.7
		Onshore LGV movements (commuting)	0.4
	Construction and installation processes	Installation offshore vessel movements and operations	39.8
		Installation onshore transport movements	<0.1
		Onshore energy use	1.1
Operation and maintenance	Operation and maintenance activities	Operation and maintenance energy requirements from offshore vessels	997.8
		Operation and maintenance offshore materials	78.4
		Offshore operation and maintenance commuting road journeys	2.9
Decommissioning	Decommissioning activities	Offshore and onshore	146.6
TOTAL			2,303.2



5. Preliminary assessment of GHG emissions

- 5.1.1 This section presents the assessment of the effect of the Proposed Development on climate resulting from GHG emissions arising from the construction, operation and maintenance, and decommissioning phases of the Proposed Development based on the design available at the time of PEIR publication.
- 5.1.2 At this stage of the design of the Proposed Development, it has not been possible to carry out a full life cycle GHG inventory analysis, as detailed specifications of the Proposed Development elements are required to complete such an exercise. Such detail is only expected at detailed design and will not be available until post-DCO consent.
- 5.1.3 Using current design knowledge, expert judgement and published literature studies, an indication of the nature and magnitude of GHG emissions associated to the Proposed Development has been estimated in this section and described in more detail within **Annex A**.
- 5.1.4 Within the construction phase, the embodied carbon associated with the use of materials is the biggest contributor to the GHG emissions associated with the Proposed Development. Material assets such as steel and fibreglass can have high embodied carbon contents (depending on the specifications and energy used in their production).
- 5.1.5 **Table 5-1** contains the breakdown and comparison of GHG emissions from each assessed GHG source during the construction, operation and maintenance, and decommissioning phase of the Proposed Development.

Phase	GHG emission source	Percentage of the estimated GHG emissions
Construction	Materials	40.4%
	Transport of materials and labour to site	4.6%
	Construction and installation processes	1.8%
Operation and maintenance	Operation and maintenance activities	46.9%
Decommissioning	Decommissioning activities	6.4%

Table 5-1 Estimation of GHG emissions associated with the Proposed Development

5.1.6 As outlined in **Table 4-2**, the total GHG emissions over the life cycle of the Proposed Development (construction phase plus 30 years operation and maintenance phase, and decommissioning phase) is estimated at approximately 2,303ktCO₂e.

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5.2 Comparison against relevant UK carbon budget

- 5.2.1 In line with IEMA guidance (IEMA, 2017), **Table 5-2** provides an assessment of the Proposed Development's GHG emissions impact against the UK Government's five-year carbon budgets.
- 5.2.2 The 6th carbon budget will be legislated by June 2021 and is more onerous to reflect the recent commitment to a net zero carbon economy by 2050, and the CCC has indicated that the trajectory could be steeper over time (CCC, 2019b). It is not expected that the near-term carbon budgets will be significantly different to those currently published.
- 5.2.3 The GHG assessment has considered GHG emissions from the Proposed Development in three separate phases: construction, operation and maintenance, and decommissioning.
- 5.2.4 The construction of the Proposed Development will be a short-term activity that runs from approximately 2025 to 2028. GHG emissions from the construction phase will therefore fall within the fourth (2023 to 2027) and fifth (2028 to 2032) carbon budgets. GHG emissions from the operation and maintenance phase of the Proposed Development will fall into the fifth (2028 to 2032) and sixth (2033 to 2037) and subsequent future budgets once set through from 2038 to 2050.
- 5.2.5 **Table 5-2** presents the net ktCO₂e associated with the construction, operation and maintenance, and decommissioning phases of the Proposed Development during each of the legislated carbon budget periods. Net GHG emissions are also contextualised within the sixth carbon budget period based on UK Government legislation to set the budget at the level recommended by the CCC, it will be enshrined in law by the end of June 2021.

Proposed Development phases	Estimated total GHG emissions from the Proposed Development over relevant carbon budgets (ktCO ₂ e) (do- something scenario)	Net GHG emissions over relevant carbon budgets (ktCO ₂ e) (do- something- do- minimum)	Net Pro GHG em carbo 4 th (2023 to 2027)	posed Deve hissions per n budget (k 5 th (2028 to 2032)	elopment relevant tCO ₂ e) 6 th (2033 to 2037) ²
Construction	1,077.4	1,077.4	808.0	269.3	0

Table 5-2 Estimated GHG emissions in comparison to relevant carbon budgets

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² Note the sixth carbon budget is based an allowance of 965MtCO₂e which has been accepted by the UK Government following recommendation from the CCC. Although legislation has been laid to set this budget, it will be enshrined into UK law by the end June 2021.

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Proposed Development phases	Estimated total GHG emissions from the Proposed Development over relevant carbon budgets (ktCO ₂ e) (do- something scenario)	Net GHG emissions over relevant carbon budgets (ktCO ₂ e) (do- something- do- minimum)	Net Prop GHG em carboi 4 th (2023 to 2027)	bosed Deve issions per h budget (kt 5 th (2028 to 2032)	lopment relevant tCO ₂ e) 6 th (2033 to 2037) ²
Operation and maintenance	1,079.1	-43,219.9	0	-5,762.7	-7,203.3
Decommissioning	146.6	146.6	0	0	0
Total	2,303.2	-41,995.9	808.0	-5,493.3	-7,203.3

- 5.2.6 The lifetime GHG emissions saving of 43,220ktCO₂e is substantial relative to the current UK grid electricity mix (based substantially on fossil-fuelled generation), clearly illustrating the GHG emissions savings that result from offshore wind electricity generation.
- 5.2.7 Operation and maintenance phase GHG emissions calculated for the years within each carbon budget period include the average annual GHG emissions associated with operation and maintenance energy use.
- 5.2.8 This assessment has established that during the period when GHG emissions from the Proposed Development will be at their highest level (short- and near-term construction activity), the Proposed Development will contribute up to 0.04% of the UK's carbon budget for the fourth carbon budget of 1,950MtCO₂e between 2023 to 2027). The Proposed Development GHG emissions will equate to a 0.32% offset of the UK's fifth carbon budget of 1,725MtCO₂e between 2028 and 2032 and up to a 0.75% offset of the sixth carbon budget of 965MtCO₂e for 2033 to 2037.
- 5.2.9 In this context, it is concluded that the GHG impact of the Proposed Development will have a positive material impact on carbon reduction targets as set by the UK Government, and therefore it is considered unlikely that the Proposed Development will in isolation cause significant negative effects on climate.

5.3 Carbon payback period

5.3.1 The carbon payback period represents the time required before displaced GHG emissions equal the life cycle GHG emissions for the Proposed Development, (i.e. the Proposed Development has saved more GHG emissions relative to electricity production by other means than will be produced by its construction, operation and maintenance, and decommissioning).
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- 5.3.2 Relative to GHG emissions produced through electricity generated via fossil fuel plants (estimated to be 446tCO₂/GWh or 551tCO₂e/GWh), the electricity generation from Rampion 2 saves approximately 538gCO₂e/kWh electricity generated. This means that after approximately 4,282GWh generated, the Proposed Development will have saved the carbon that will be emitted during its lifecycle, (i.e. including the construction, operation and maintenance, and decommissioning). This generation will be achieved after approximately 2.36% of its operational lifetime of around 30 years, or around 9 months.
- 5.3.3 It should be noted that wind power will not replace all forms of conventional electricity generation equally and the true GHG emission displacement will depend on a combination of factors including the type of power generation being replaced and changes in efficiency of conventional power plants. While it is anticipated that wind power will displace fossil fuel electricity generation, the carbon payback period of other electricity generation forms is shown in **Table 5-3**.

Generation type	Coal	Gas	All fossil fuels	All fuels (including nuclear and renewables)	BEIS Energy and Emission Projections 2040 all power generation
Estimated GHG emissions (CO ₂ e) per GWh of electricity	1216	458	551	244	67
Carbon payback period of the Proposed Development (GWh)	1,914	5,172	4,282	9,939	42,423
Carbon payback period of the Proposed Development (time)	4 months	11 months	9 months	20 months	85 months (7 years, 1 month)

Table 5-3Calculation of the carbon payback period of the Proposed Developmentrelative to other forms of electricity generation

- 5.3.4 Over the lifetime of the Proposed Development there is potential for changes in energy mix, efficiency improvements and new technologies (such as carbon capture and storage). Such changes will have the impact of reducing the GHG emission intensity for UK electricity generation.
- 5.3.5 Projections for future GHG emission intensity for all power producers in Great Britain (excluding some auto-generation) have been produced by BEIS Energy and Emissions Projections (EEP) 2019 (BEIS, 2020c). In 2040, the latest year projections are available for, GHG emission intensity of electricity is anticipated to be 67gCO₂e/kWh. The carbon payback for the Proposed Development against this GHG emission intensity is also shown in **Table 5-3**. It should be noted that this

calculation has been performed at a high-level for representation purposes only and does not represent a projection of carbon payback of the Proposed Development under a future scenario with evolving energy intensity. The calculation assumes the lower GHG emission intensity for power production throughout the lifetime of the Proposed Development.

5.3.6 It is concluded in the preliminary assessment of GHG emissions, that the Proposed Development will 'pay back' the GHG emissions emitted during its lifetime in less than a year (approximately 9 months) on the assumption that it displaces electricity generation by fossil fuels. After this, it will of course continue to save GHG emissions throughout its lifetime continuing to the decarbonisation of the UK economy and the UK's net zero target.

5.4 Further work to be undertaken at ES

5.4.1 It is not anticipated that a significant update to the GHG assessment will be required at ES as the detailed design required for a full lifecycle GHG assessment will not be available until post-consent. However, any updates to the design of the Proposed Development or newly available data sources will be incorporated into the GHG assessment at ES.

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6. Glossary of terms and abbreviations

Table 6-1 Glossary of terms and abbreviations

Term	Description			
Availability factor	Factor to account for downtime of an offshore wind farm development for troubleshooting, maintenance and major corrective works.			
BEIS	Department for Business, Energy and Industrial Strategy			
BSI	British Standards Institution			
Capacity factor (also known as load factor)	Provides an indication of the ratio of electricity that will realistically be generated as a proportion of the total generating capacity. The capacity factor for offshore wind farms will be heavily influenced by weather conditions (i.e. wind speeds).			
Carbon	'Carbon' is used as shorthand to refer to the basket of six greenhouse gases (GHGs) recognised by the Kyoto Protocol. GHGs are converted to carbon dioxide equivalents (CO ₂ e) based on their global warming potential per unit as compared to one unit of CO ₂ .			
Carbon dioxide equivalent (CO ₂ e)	Carbon dioxide equivalent (CO ₂ e) is a term for describing different greenhouse gases in a common unit. For any quantity and type of greenhouse gas, CO ₂ e represents the amount of carbon dioxide (CO ₂) which would have the equivalent global warming impact.			
Carbon payback period	The period of time required before displaced GHG emissions equal the life cycle GHG emissions for the Proposed Development.			
CCC	Committee on Climate Change			
CH4	Methane			
Climate	Climate is usually defined as the average weather over a period of time ranging from months to thousands or millions of years. The classical period for averaging these variables is 30 years, as defined by the World Meteorological Organization. Weather factors often considered in climate are surface variables such as temperature, precipitation and wind.			
Climate change	The United Framework Convention on Climate Change (UNFCCC), in its Article 1, defines climate change as: 'a change of climate which is attributed directly or indirectly to human			



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Term	Description
	activity that alters the composition of the global atmosphere and which is in addition to natural climate variability observed over comparable time periods'. While climate change can be attributable to natural causes, the UNFCCC distinguish climate change as related to human activities altering the atmospheric composition and climate variability.
CO ₂	Carbon dioxide
Development Consent Order (DCO)	This is the means of obtaining permission for developments categorised as Nationally Significant Infrastructure Projects, under the Planning Act 2008.
Do-minimum scenario	A scenario where the Proposed Development is not built and the latest equivalent data for the UK grid average generation intensity is consumed.
Do-something scenario	A scenario where the Proposed Development with embedded environmental measures is built. The expected policy impacts of the do-minimum scenario also underpins this do-something scenario.
DUKES	Digest of United Kingdom Energy Statistics
EIA	Environmental Impact Assessment
Embodied carbon	The embodied carbon describes the carbon footprint of a material, allowing for the sum of the energy required in resource extraction, and any processing required, as well as the transport and supply logistics to the factory gate (prior to transport to the Proposed Development for use), to be accounted for within the overall GHG estimation.
EMR	Electricity Market Reform
Environmental Statement (ES)	The written output presenting the full findings of the Environmental Impact Assessment.
EU	European Union
gCO ₂ e	Grams (g) of carbon dioxide equivalent (CO2e).
GHG emission factor	The GHG emissions factors relate a given level of activity, or amount of fuel, energy or materials used, to the mass of GHGs released as a consequence. It is measured in the amount of GHG emissions (in gCO ₂ e, tCO ₂ e, ktCO ₂ e, MtCO ₂ , etc.) relative to the activity unit (e.g. tonnes, km, kgs etc.)

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Term	Description
GHG intensity	Measures the GHG emissions of different types of electricity generation relative to the intensity of the electricity generation. It is measured in emissions of CO ₂ e or CO ₂ (e.g. gCO ₂ e, tCO ₂ etc.), relative to an energy unit e.g. kWh, GWh, etc.
Greenhouse Gas (GHG) emissions	GHG emissions are determined by the Kyoto Protocol (1997) to include seven gases: carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons, sulphur hexafluoride and nitrogen trifluoride. To provide consistent reporting of these gases, each is weighted by its global warming potential and converted to a carbon dioxide equivalent (CO ₂ e).
GtCO ₂ e	Giga-tonnes (Gt) of carbon dioxide equivalent (CO2e).
GW	Gigawatts
HFC	Hydrofluorocarbon
HGV	Heavy Goods Vehicle
ICE	Inventory of Carbon and Energy
IEMA	Institute of Environmental Management and Assessment
IPCC	Intergovernmental Panel on Climate Change
JB	Joint Bay
ktCO ₂ e	Kilo-tonnes (kt) of carbon dioxide equivalent (CO2e).
LGV	Light Good Vehicle
Low carbon activity	Low carbon activities are those that generate products or services which themselves deliver low carbon outputs.
MtCO ₂ e	Mega-tonnes (Mt) of carbon dioxide equivalent (CO2e).
MW	Megawatts
N ₂ O	Nitrous oxide
Net zero GHG emissions	Net-zero GHG emissions are achieved when GHG emissions to the atmosphere are balanced by anthropogenic removals.
NF ₃	Nitrogen trifluoride
NPPF	National Planning Policy Framework
NPS	National Policy Statement

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Term	Description
PFC	Perfluorocarbons
Planning Inspectorate (PINS)	The Planning Inspectorate deals with planning appeals, national infrastructure planning applications, examinations of local plans and other planning-related and specialist casework in England and Wales.
Preliminary Environmental Information Report (PEIR)	The written output of the Environmental Impact Assessment undertaken to date for the Proposed Development. It is developed to support formal consultation and presents the preliminary findings of the assessment to allow an informed view to be developed of the Proposed Development, the assessment approach that has been undertaken, and the preliminary conclusions on the likely significant effects of the Proposed Development and environmental measures proposed.
Proposed Development	The development that is subject to the application for development consent, as described in Chapter 4: The Proposed Development, Volume 2.
RED	Rampion Extension Development Limited
RICS	Royal Institution of Chartered Surveyors
SF ₆	Sulphur hexafluoride
UK	United Kingdom
UK Carbon Budget	The UK Carbon budgets were introduced under the Climate Change Act (2008). Each carbon budget provides a five-year, statutory cap on total greenhouse gas emissions, which should not be exceeded, in order to meet the UK's emission reduction commitments. So far, five carbon budgets have been set in law, covering the period from 2008 to 2032. These limit UK GHG emissions from all sources, excluding international aviation and shipping. Draft legislation for the sixth carbon budget has been submitted to Parliament and will be legislated by end of June 2021.
UNFCCC	United Nations Framework Convention on Climate Change
WBCSD	World Business Council for Sustainable Development
WRI	World Resources Institute
WTG	Wind Turbine Generator

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Annex A Supporting Data for the GHG assessment

Overview

The GHG assessment has been based on design assumptions described in **Chapter 4: The Proposed Development, Volume 2**. Where further information has been obtained from the project designers or literature sources this is described in this Annex.

Embodied carbon

GHG emission factors have been sourced primarily from the Inventory of Carbon and Energy (ICE) Database (ICE, 2019) and supplemented by literature studies where required.

GHG emission factors for the principal materials required for the Proposed Development are noted below. These are sourced from the ICE Database unless otherwise stated:

- steel, global seamless tube 2.13kgCO₂e/kg;
- steel, cold-rolled coil 2.73kgCO₂e/kg;
- fibreglass 8.1kgCO₂/kg;
- iron (used for cast iron) 2.03kgCO₂e/kg;
- copper 2.71kgCO₂e/kg;
- SF₆ (production) 9.00kgCO₂/kg (Harrison et al., 2010)
- stone (used for rock armour protection) 0.079kgCO₂e/kg;
- gravel (used for scour protection gravel bed) 0.007kgCO₂e/kg;
- aluminium 6.67kgCO₂e/kg; and
- concrete 0.103kgCO₂e/kg.

Embodied carbon represents the amount of GHG emissions produced during the process to create a product including its extraction, refinement, process, transport and fabrication. The exact location of the manufacture of equipment and plant will not be known until detailed design which will likely occur post consent and therefore, assumptions based on professional judgement have been made to estimate the distance from suppliers to the Proposed Development. European or worldwide embodied carbon factors from the ICE database have been used where possible to represent potential variations in transport requirements.

Wind turbine generator (WTG) and foundations

At present, best-in-class WTG design has a maximum generating capacity of 14MW. Based on results of a literature assessment, a linear relationship is found between WTG total material balance and key parameters of WTGs, including generating capacity, rotor blade diameter and tower height. This scaling has been used to estimate approximate material quantities for larger turbines considered in the GHG assessment based on

available data from Siemens Gamesa SG222 14MW WTG. Materials required for the construction of the blades, blade bearings, hub, generator, main bearing, transformer, convertor, nacelle cover, nacelle main frame, pitch cylinder, yaw and bedframe, cooling, tower and switchgear have been provided.

Total material quantities for the larger WTG and individual WTG components have been determined based on linear interpolation using rotor blade diameter and tower height assumptions described in **Chapter 4: The Proposed Development, Volume 2** and giving consideration to potential future capacity based on technological development. The greatest material quantities have been taken in all cases. It should be noted that this provides an estimate as the technology for larger turbines does not exist.

To ensure a proportional approach, GHG emissions have only been calculated for the main materials associated with the WTG which includes fibreglass, steel alloy, cast iron, steel, copper, glass and ester oil. These materials contribute 98.68% of the total weight of the WTG and therefore represents a proportional approach. Quantities are given in **Table A-1**.

Material	Estimated weight for one larger turbine (tonnes)	GHG emission factor (kgCO₂e/kg)	Total GHG emissions for 75 larger WTG (ktCO2e)
Fibreglass (expoxy)	224.1	8.10	135.2
42CrMo4 (steel alloy)	54.7	2.13	8.7
Cast iron	164.0	2.03	25.0
Steel	1,681.5	2.13	268.6
Copper	111.5	2.71	22.7
Glass	1.4	1.44	0.1
Ester Oil	7.7	3,181.42	1.8
Other ³	29.9	N/A	N/A
TOTAL	2,274.9	-	461.2

Table A-1Material quantities and GHG emissions for the key materials within WTG

To provide a worse-case assessment, it has been assumed that all foundations will be jacket foundations since these are associated with a greater quantity of steel and therefore embodied carbon emissions. The weight of one jacket foundation is taken as 2,160 tonnes and is assumed to be composed entirely of steel. No other materials have been assessed

³ Consisting of carbon fibre, neodymium, 100 Cr6, polymer and polyester.



within the GHG assessment as these are assumed to compose <1% of the material weight.

For the scour protection, it has been assumed that the rock armour has a density of 2,650kg/m³ while the gravel bed has a density of 1,346kg/m³. Volumes of scour protection are consistent with the worse-case information provided for the larger WTG type in **Chapter 4, Volume 2**.

Cables

GHG emission factors for the inter-array cables and offshore export cable have been based on literature studies of similar projects. The array cables are estimated to have an embodied carbon of 39,387kgCO₂e/km, which has been based on the results of four studies with values ranging from 20,486 – 63,653kgCO₂e/km (Birekland, 2011; Chapman, 2015; Xodus Group, 2012 and Arvesen et al., 2014).

Literature studies have been bench-marked against the Proposed Development specific data to confirm accuracy where GHG emissions have been calculated based on the anticipated weight of copper core material within the export cables (400mm² cores, total weight of 2,688 tonnes). Both methods for calculation of GHG emissions from the interarray cables were found to be in the same order of magnitude. The calculation method based on literature study has been used in the GHG assessment as it provides a representation of other materials within the cables (i.e. insulation and armour) and can therefore be considered worse-case.

The export cables have been estimated to have an embodied carbon of 97,902kgCO₂e/km, which has been based on the results of three studies with values ranging from 58,394 – 119,652kgCO₂e/km (Birkeland, 2011; Chapman, 2015; and Xodus Group, 2012).

Literature studies have been bench-marked against Proposed Development specific data to confirm accuracy where GHG emissions have been calculated based on the anticipated weight of aluminium core material within the export cables (1,600mm² cores, total weight of 1,888 tonnes). Both methods for calculation of GHG emissions from the export cables were found to be in the same order of magnitude. The calculation method based on literature study has been used in the GHG assessment as it provides a representation of other materials within the cables (i.e. insulation and armour) and can therefore be considered worse-case.

The onshore cable has been based on the aluminium core weight only, assuming that 1,400 mm² aluminium cable cores will require 1,699 tonnes of aluminium.

Substations

It has been assumed that three offshore substations will be required, each comprising a topside structure (2,000 tonnes of steel per topside) situated on a jacket foundation (1,500 tonnes of steel per jacket). No other materials from the offshore substations have been assessed within the GHG assessment as these have been assumed to compose <1% of the material weight.

The onshore substation is expected to comprise electrical equipment and buildings. The quantities of materials required for each component are shown in **Table A-2**. Materials

required for foundations of the electrical equipment have not been included at this stage as detailed design is unknown.

Component	No. required	Silicon steel (kg)	Copper (kg)	Steel (kg)	Oil (tonnes)	SF₀ Gas (kg)
650MVA 400kV/275kV Main Transformer	3	134,200	19,867	70,800	165	-
275kV Reactor	6	47,300	7,000	25,000	35	-
Auxiliary Transformer	3	96	15	71	0	-
STATCOM Transformers	6	22,500	3,060	10,900	8	-
275kV GIS Switchgear	14	-	-	27,000	-	2,000
400kV GIS Switchgear	7	-	-	40,000	-	3,000

Table A-2	Material	quantities	for	components	of	the	onshore	substation
	matorial	quantitiou	101	componionito		u io	011011010	ousolution

Oil within the onshore substation has been assumed to be naphtha liquid fuel with a GHG emission factor of 3,142.87kgCO₂e/tonnes (BEIS, 2020).

The onshore substation includes a control building (floor area of 784m²), a 275kV GIS building (floor area of 875m²) and a 400kV GIS building (floor area 700m²). These buildings have been assumed to be steel framed industrial buildings with an estimated embodied carbon per square metre of 234kgCO₂e (Building Design, 2021).

Joint Bays

Joint bays (JB) have been assumed to be 14m x 4m with a floor thickness of 0.15m and a wall thickness of 0.25m. It has also been assumed that these will be constructed from concrete, requiring a volume of 8.4m³ per JB. Number of joint bays is consistent with details provided in **Chapter 4**, **Volume 2**.

Transport of materials and labour to site

It has been assumed that all workers will commute a one-way distance of 15km to the onshore site by light goods vehicle (LGV), based on 2019 data from the Department for Transport on average commuting distances.

All materials for the onshore works have been assumed to be transported to the site by heavy goods vehicles (HGV). The vast bulk of HGV movements relate to transport of sand

and gravel/crushed stone. In the absence of firm procurement decisions, which will be made at detailed design post-DCO Application, the assumed distance travelled by HGV (70km) has been based on an average distance from potential outlets for such materials in the geographical vicinity of the Proposed Development.

All materials for the offshore works are assumed to be transported to the site by marine vessel. The location of the Marshalling Yard/Pre-Assembly Harbour has been assumed as the base for installation vessels, transport vessels and cable laying vessels. It is assumed to be based in Northern Europe (UK, Netherlands or Germany).

Construction and installation processes

Energy use from onshore construction processes has been estimated as 0.12% of the GHG emissions from embodied carbon associated with the Proposed Development. This value is based on recent lifecycle carbon assessments for offshore wind farms similar to the Proposed Development (Xodus Group, 2012; Norfolk Boreas Offshore Wind Farm, 2020) which ranged from 0.04 - 0.28% of embodied carbon emissions. This is in lieu of more detailed information for construction processes on site which will not be available until later in the design process.

GHG emissions for the marine vessels have been calculated using the following approach:

• GHG emissions $(kgCO_2e) = C (kgCO2e/l) \times SFC (l/kWh) \times P (kW) \times t (h)$

This is based on:

- GHG emission factors (C): BEIS 2020 GHG emission factors for marine fuel oil of 3.12kgCO₂e/l or marine gas oil of 2.78kgCO₂e/l (BEIS, 2020);
- specific fuel consumption (SFC): of 0.226l/kWh;
- effective power of the vessel's engines (P), based on broad assumptions of the use of similar vessels to those used for the existing Rampion 1 project; and
- time (t) in hours that the power is required.

A range of marine vessels are required for construction and installation. For each broad category, example vessels based on those used for the existing Rampion 1 project have been used to inform the effective power (effective power including all efficiency losses) of vessel engines. This is set out in **Table A-3**. Technological advances in marine vessels mean that this is considered a worse-case scenario approach.

The quantity of time spent on each activity has been generated from a literature review and is set out in **Table A-3** for each broad category of marine vessel. Time spent in transit is assumed to use 100% total installed power (worse-case scenario), while based on a literature review, time spent within the array is assumed to use 28% of total installed power.

Offshore cable laying is assumed to be laid at rate of 5km/day.

Category of marine vessel	Total installed power (kW)	Estimate of (non-transit) activity (hours) per marine vessel movement
Installation vessels - WTG/foundations	15,586	24
Support vessels	6,500	12
Transport vessels	16,200	24
Crew transfer vessels	1,104	8
Main laying vessels	14,740	104
Main jointing vessels	10,200	100
Main burial vessels	10,200	156
Spoil barges	803	5

Table A-3 Categories of marine vessel and total installed power (kW)

Other vessels, notably smaller craft and crew transfer vessels are assumed to be locally sourced, with an assumed average distance of 34.5km from port to the centre of the array.

Operation and maintenance GHG emissions

Operation and maintenance phase activities of the onshore elements of the Proposed Development are described in **Chapter 4**, **Volume 2** and are anticipated to be minimal. This is because maintenance of the onshore cable will be undertaken by light vehicle access only, while monitoring of the onshore substation will be undertaken remotely and is only expected to require minimal scheduled maintenance and operation activities. The GHG emissions associated with this activity is therefore negligible and has been scoped out of the GHG assessment.

Operation and maintenance phase activities occurring offshore are anticipated to include:

- array and export cable repairs;
- replenishment of array and export cables rock protection;
- J-tube replacements on WTG and offshore substations;
- anode replacement on the WTG and offshore substation;
- ladder replacements on the WTG and offshore substation;
- WTG exchange events associated with failures of major WTG components; and
- offshore substation exchange events associated with major failures.

GHG emissions associated with the materials required for these operation and maintenance phase activities are detailed in **Table A-4**.

For the purposes of the GHG emissions assessment, it has been assumed that no onshore cables require replacement and materials required for painting and cleaning events of WTGs are scoped out.

J-tubes are assumed to weight 184.19kg/m and be 10m in length based on literature searches (Flamco, 2013).

Anodes consists of 45kg of aluminium based on literature studies (Cathwell, 2021).

Ladder replacements are assumed to be associated with the replacement of the external ladder from the boat landing to the work platform. Expert knowledge from the existing Rampion 1 project suggests that the total weight of the boat landing, rest platforms and external access ladder is 14,393kg. It is assumed that this is all composed of steel. It is unknown what proportion of this weight is associated with the external access ladder and therefore the total weight has been used as a worse-case in the GHG emissions assessment.

Exchange events are associated with failures of major WTG components. This cannot be quantified since it will depend on the reliability of the various components and the nature of failures and therefore an estimate has been provided.

The average weight of the components of the 14MW WTG described in **Table A-1** is 118 tonnes which is equivalent to 7% of the total weight of the 14MW WTG, although it is recognised that the components will all have varying embodied carbon associated with their replacement. Recent lifecycle carbon assessments for offshore wind farms have suggested that spare parts account for 10% of production costs (Chapman, 2015) and 16% of GHG emissions associated with WTGs (embodied carbon and installation). For the Proposed Development, exchange events in the WTG have therefore been estimated as 10% of the embodied carbon of WTG.

This approach has also been applied to exchange events associated with the offshore substations which are estimated as 10% of the embodied carbon of the offshore substation.

A worse-case scenario approach has been taken with regard to vessel movements associated with operation and maintenance activities, including the following:

- numbers of Jack up vessels required is based on a worse-case per year scenario (rather than an average); these will originate from Northern Europe and be utilised for 14 days per occurrence; and
- each operation and maintenance activity will require a separate vessel movement.

Assumed 'work' hours for different operation and maintenance activities have been taken from literature reviews including: crew transfer vessels (8 hours work); minor repairs (average of 8 hours); major repairs (average of 34 hours); substation major repair (average of 48 hours); and cable replacement (average 32 hours).

Offshore operation and maintenance activities are assumed to require some road journeys associated with workers commuting. It has been assumed that 50 staff vehicles per day will be required in line with the PEIR transport assessment (**Chapter 24: Transport**, **Volume 2**). Consistent with previous assumptions, a one-way distance of 15km by light goods vehicle (LGV) is used, based on 2019 data from the Department for Transport on



average commuting distances. Calculations are based on 265 working days per year for 30 years.

Table A-4	Breakdown	of embodied	carbon	associated	with	materials	required	for	the
operation and	d maintenand	e phase							

Component	Activity data	GHG emissions (ktCO₂e)
Array cable repairs	3.6km of cable (6 lifetime events, 600m per event)	0.1
Export cable repairs	2.4km of cable (4 lifetime events, 600m per event)	0.2
Rock replacement for cables (array and export)	111,300,000kg of stone (25% of original rock protection volume)	8.8
J-tube replacements (WTG and offshore substation)	478,894kg of steel (260 events)	1.0
Anode replacement (WTG and offshore substation)	30,240kg of aluminium (636 events)	0.4
Ladder replacement (WTG and offshore substation)	9,153,948kg of steel (642 events)	19.5
WTG exchange events	10% of embodied carbon associated with WTG	46.1
Offshore substation exchange events	10% of embodied carbon associated with offshore substation	2.2
TOTAL		78.4





4.5.3



Volume 4, Appendix 5.3 Cumulative effects assessment detailed onshore search and screening criteria



1. Onshore detailed Cumulative Effects Assessment criteria

1.1 Temporal, spatial and information criteria

- 1.1.1 Other developments in proximity to Rampion 2 have been considered in the onshore Cumulative Effects Assessment (CEA) if they meet the following temporal, spatial and technical criteria.
- 1.1.2 The temporal criteria are defined as:
 - projects that have started construction up to five years prior to publication of PEIR; and
 - projects that are deemed likely to go ahead or are going ahead up to 13 years after publication of PEIR.
- 1.1.3 The spatial criteria are defined as the largest extent of the Zones of Influence (ZOI) identified by each aspect. This takes into consideration the areas and receptors likely to be affected by Rampion 2 activities and facilities. For the onshore CEA, the search area consists of a 2km buffer around the PEIR Assessment Boundary, plus the downstream extents of any watercourses that intersect the PEIR Assessment Boundary to their discharge to sea. Further details are provided in **Chapter 5: Approach to the EIA, Table 5-7**, and the search area is shown on **Figure 5.4.2**, **Volume 3**.
- 1.1.4 The technical criteria are defined as Tier 1 or 2 developments under PINS 'other existing development and/or approved development', and Tier 3 where sufficient information is available to include in the assessment (defined in Chapter 5, Table 5-3). The following types and sectors of other developments that have been considered within the onshore CEA ZOI include:
 - all residential developments of more than 50 properties;
 - all energy infrastructure developments;
 - developments which require an EIA, that is those which fall under Schedule 1 or 2 of the Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (the 'EIA Regulations 2017'); and
 - local plan sites¹.
- 1.1.5 Two relevant NSIPs have been identified that are located within the south east region but which lie outside the onshore CEA ZOI.
 - Southampton to London Pipeline Project: This development aims to replace 90km of Esso Petroleum Company Limited's 105km aviation fuel pipeline that runs from Fawley Refinery near Southampton to Esso's West London Terminal



¹ Sites identified within Local Plans will generally not be assessed directly due to lack of detailed information, but any planning applications for allocated sites which arise prior to submission of the ES will be included.

Storage Facility in Hounslow. The proposed buried replacement pipeline is located approximately 40km to the west of Rampion 2 PEIR Assessment Boundary onshore. The proposed construction schedule indicates that construction will be complete by spring 2023.

- The Aquind Interconnector: This development comprises the proposed construction and operation of an electricity interconnector between Normandy in France and Hampshire in the UK, including both onshore and offshore elements. An onshore buried cable route is proposed between National Grid substation at Lovedean, Hampshire and Eastney, Hampshire covering a distance of approximately 20km. The onshore elements of the development are located approximately 32km to the west of the onshore elements of Rampion 2 at the closest point. The offshore cable route is proposed between Eastney, Hampshire and the UK/France Exclusive Economic Zone (EEZ) boundary, covering a distance of approximately 109km. Part of the offshore elements of the development are located within the PEIR Assessment Boundary in the south west corner. The indicative programme suggests that construction onshore will be complete by 2023 and offshore by 2022.
- 1.1.6 It is not anticipated at this stage that the construction of these will coincide with the construction of Rampion 2, although these have been considered and are listed in Appendix 5.4: Cumulative effects assessment shortlisted developments, Table 2-1, Volume 4.

1.2 References

Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (as amended). (2017 No. 572). UK: The Stationery Office Limited.



4.5.4



Volume 4, Appendix 5.4 Cumulative effects assessment shortlisted developments







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Figure 5.4.1	Offshore projects screened into the Cumulative Effects Assessment
Figure 5.4.2	Onshore Cumulative EffectsAssessment shortlist



1. Offshore shortlisted other developments

Table 1-1 lists the offshore 'other developments' identified for inclusion in the CEA. The locations of these developments are also shown in **Figure 5.4.1**, **Annex A**.

Table 1-1Shortlisted other developments (offshore)

ID (Figure 5.4.1)	Development name	Status	Confidence in assessment	Description of development	Tier 1	Distance to Rampion 2 offshore export cable corridor (km)	Distance to Rampion 2 array area (km)
W1	Awel y Mor	Proposed	Low, Environmental Statement not available.	Offshore wind farm	2	363.3	376.0
W2	Barrow	Operational ²	High	Offshore wind farm	*2	398.2	412.1
W3	Beatrice	Operational ²	High	Offshore wind farm	*2	834.0	848.7
W4	Beatrice Demonstrator	Operational ²	High	Offshore wind farm	*2	834.0	848.7
W5	Blyth Demonstration Site	Operational ²	High	Offshore wind farm	*2	484.8	498.7

¹ Please refer to **Table 5-3** of **Chapter 5: Approach to EIA**, **Volume 2** for definitions of Tiers. ² Refer to **Chapter 12: Offshore ornithology** for detail on inclusion of this development

wood.

ID (Figure 5.4.1)	Development name	Status	Confidence in assessment	Description of development	Tier 1	Distance to Rampion 2 offshore export cable corridor (km)	Distance to Rampion 2 array area (km)
W6	Borssele I	Under Construction (Commissioning expected 2021- 2022)	High – Third-party project details published in the public domain and confirmed as being 'accurate' by the developer.	Offshore wind farm	1	244.7	263.1
W7	Borssele II	Under Construction (Commissioning expected 2021- 2022)	High – Third-party project details published in the public domain and confirmed as being 'accurate' by the developer.	Offshore wind farm	1	240.8	259.4
W8	Burbo Bank	Operational ²	High	Offshore wind farm	*2	346.5	359.9
W9	Burbo Bank Extension	Operational ²	High	Offshore wind farm	*2	346.5	359.9
W10	Dieppe – Le Treport (France)	Under construction (2019 to 2023)	Medium – Third-party project details published in the public domain but not confirmed as being 'accurate'.	Offshore wind farm	1	<50	<50

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ID (Figure 5.4.1)	Development name	Status	Confidence in assessment	Description of development	Tier 1	Distance to Rampion 2 offshore export cable corridor (km)	Distance to Rampion 2 array area (km)
W11	Dogger Bank A	Consented (Construction expected 2022 – 2024)	High – Third-party project details published in the public domain and confirmed as being 'accurate' by the developer.	Offshore wind farm	1	464.5	462.3
W12	Dogger Bank B	Consented (Construction expected 2022 – 2024)	High – Third-party project details published in the public domain and confirmed as being 'accurate' by the developer.	Offshore wind farm	1	477.7	473.2
W13	Dogger Bank C	Consented (Construction expected 2023 – 2026)	High – Third-party project details published in the public domain and confirmed as being 'accurate' by the developer.	Offshore wind farm	1	509.3	508.7
W14	Dudgeon	Operational ²	High	Offshore wind farm	*2	300.7	300.3
W15	East Anglia One	Operational ²	High	Offshore wind farm	*2	256.4	240.9
W16	East Anglia One North	Application Submitted	High – Third-party project details	Offshore wind farm	3	247.7	261.4

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ID (Figure 5.4.1)	Development name	Status	Confidence in assessment	Description of development	Tier 1	Distance to Rampion 2 offshore export cable corridor (km)	Distance to Rampion 2 array area (km)
		(Construction expected 2023 – 2026)	published in the public domain and confirmed as being 'accurate' by the developer.				
W17	East Anglia Three	Consented (Construction expected 2023 – 2026)	High – Third-party project details published in the public domain and confirmed as being 'accurate' by the developer.	Offshore wind farm	2	285.1	298.8
W18	East Anglia Two	Application Submitted (Construction expected 2023 – 2026)	High – Third-party project details published in the public domain and confirmed as being 'accurate' by the developer.	Offshore wind farm	3	217.9	232.9
W19	European Offshore Wind Development Centre	Operational ²	High	Offshore wind farm	*2	718.6	732.8

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ID (Figure 5.4.1)	Development name	Status	Confidence in assessment	Description of development	Tier 1	Distance to Rampion 2 offshore export cable corridor (km)	Distance to Rampion 2 array area (km)
W20	Fécamp (France)	Under construction (2020 to 2023)	High – Third-party project details published in the public domain and confirmed as being 'accurate' by the developer.	Offshore wind farm	1	<50	<50
W21	Five Estuaries (Galloper Extension)	Proposed	Low, Environmental Statement not available.	Offshore wind farm	3	209.5	191.1
W22	Forthwind Demonstration Project (Methil)	Operational ²	High	Offshore wind farm	*2	617.8	633.1
W23	Galloper	Operational ²	High	Offshore wind farm	*2	202.5	184.4
W24	Greater Gabbard	Operational ²	High	Offshore wind farm	*2	202.2	184.2
W25	Gunfleet Sands	Operational ²	High	Offshore wind farm	*2	158.5	146.0
W26	Gwynt y Mor	Operational ²	High	Offshore wind farm	*2	354.8	367.9
W27	Hornsea Four	Consented (Construction expected 2025 – 2030)	High – Third-party project details published in the public domain and confirmed	Offshore wind farm	3	361.6	358.3

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ID (Figure 5.4.1)	Development name	Status	Confidence in assessment	Description of development	Tier 1	Distance to Rampion 2 offshore export cable corridor (km)	Distance to Rampion 2 array area (km)
			as being 'accurate' by the developer.				
W28	Hornsea Project One	Operational ²	High	Offshore wind farm	*2	380.2	379.2
W29	Hornsea Project Two	Under Construction (Commissioning expected 2023)	High – Third-party project details published in the public domain and confirmed as being 'accurate' by the developer.	Offshore wind farm	1	366.5	364.3
W30	Hornsea Three	Consented (Construction expected 2024 – 2028)	High – Third-party project details published in the public domain and confirmed as being 'accurate' by the developer.	Offshore wind farm	2	387.4	390.4
W31	Humber Gateway	Operational ²	High	Offshore wind farm	*2	316.6	324.2
W32	Hywind Scotland (Hywind 2)	Operational ²	High	Offshore wind farm	*2	743.2	756.2
W33	Inch Cape	Consented (Construction	High – Third-party project details	Offshore wind farm	1	648.8	634.2

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ID (Figure 5.4.1)	Development name	Status	Confidence in assessment	Description of development	Tier 1	Distance to Rampion 2 offshore export cable corridor (km)	Distance to Rampion 2 array area (km)
		expected from 2021)	published in the public domain and confirmed as being 'accurate' by the developer.				
W34	Kentish Flats Extension	Operational ²	High	Offshore wind farm	*2	133.1	117.2
W35	Kincardine	Operational ²	High	Offshore wind farm	*2	692.2	706.3
W36	Lincs, Lynn & Inner Dowsing	Operational ²	High	Offshore wind farm	*2	268.2	273.7
W37	London Array	Operational ²	High	Offshore wind farm	*2	163.0	146.1
W38	Moray East	Under Construction (Commissioning expected 2021)	High – Third-party project details published in the public domain and confirmed as being 'accurate' by the developer.	Offshore wind farm	1	837.6	822.8
W39	Moray West	Consented (Construction expected 2022 – 2024)	High – Third-party project details published in the public domain and confirmed	Offshore wind farm	1	834.9	819.9

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ID (Figure 5.4.1)	Development name	Status	Confidence in assessment	Description of development	Tier 1	Distance to Rampion 2 offshore export cable corridor (km)	Distance to Rampion 2 array area (km)
			as being 'accurate' by the developer.				
W40	Neart na Gaoithe	Under Construction (Commissioning expected 2021)	High – Third-party project details published in the public domain and confirmed as being 'accurate' by the developer.	Offshore wind farm	1	626.1	611.5
W41	Norfolk Boreas	Consent under determination (Construction expected 2022 – 2025)	High – Third-party project details published in the public domain and confirmed as being 'accurate' by the developer.	Offshore wind farm	3	313.4	324.2
W42	Norfolk Vanguard	Consent under determination (Construction expected 2024 – 2028)	High – Third-party project details published in the public domain and confirmed as being 'accurate' by the developer.	Offshore wind farm	3	294.0	303.6

ID (Figure 5.4.1)	Development name	Status	Confidence in assessment	Description of development	Tier 1	Distance to Rampion 2 offshore export cable corridor (km)	Distance to Rampion 2 array area (km)
W43	North Falls (Greater Gabbard Extension)	Proposed	Low, Environmental Statement not available.	Offshore wind farm	3	192.0	172.8
W44	North Hoyle	Operational ²	High	Offshore wind farm	*2	349.5	362.5
W45	Ormonde	Operational ²	High	Offshore wind farm	*2	412.2	426.1
W46	Race Bank	Operational ²	High	Offshore wind farm	*2	287.1	290.3
W48	Rampion 1	Active	High – Third-party project details published in the public domain and confirmed as being 'accurate' by the developer. ³	Offshore wind farm	1	10.5	0
W49	Rhyl Flats	Operational ²	High	Offshore wind farm	*2	353.3	365.9
W50	Robin Rigg	Operational ²	High	Offshore wind farm	*2	486.7	500.8
W51	Scroby Sands	Operational ²	High	Offshore wind farm	*2	259.0	252.2

³ PINS Advice Note 17 states 'Where other projects are expected to be completed before construction of the proposed NSIP and the effects of those projects are fully determined, effects arising from them should be considered as part of the baseline and may be considered as part of both the construction and operational assessment.' Rampion 1 is therefore included in the CEA because the full effects of the project offshore are considered to not yet be fully realised.

wood.

ID (Figure 5.4.1)	Development name	Status	Confidence in assessment	Description of development	Tier 1	Distance to Rampion 2 offshore export cable corridor (km)	Distance to Rampion 2 array area (km)
W52	Seagreen Alpha	Under construction (Commissioning expected 2023)	High – Third-party project details published in the public domain and confirmed as being 'accurate' by the developer.	Offshore wind farm	1	656.4	642.1
W53	Seagreen Bravo	Under construction (Commissioning expected 2023)	High – Third-party project details published in the public domain and confirmed as being 'accurate' by the developer.	Offshore wind farm	1	654.4	640.9
W54	Sheringham Shoal	Operational ²	High	Offshore wind farm	*2	283.6	282.5
W55	Sheringham Shoal and Dudgeon Extension Projects	Proposed	Low, Environmental Statement not available.	Offshore wind farm	2	282.5	283.6
W56	Sofia	Consented (Construction	High – Third-party project details published in the public	Offshore wind farm	1	489.4	487.9

wood.

ID (Figure 5.4.1)	Development name	Status	Confidence in assessment	Description of development	Tier 1	Distance to Rampion 2 offshore export cable corridor (km)	Distance to Rampion 2 array area (km)
		expected 2023 - 2026)	domain and confirmed as being 'accurate' by the developer.				
W57	Teesside	Operational ²	High	Offshore wind farm	*2	428.1	441.7
W58	Thanet	Operational ²	High	Offshore wind farm	*2	164.5	144.2
W59	Triton Knoll	Under Construction (Commissioning expected 2021)	High – Third-party project details published in the public domain and confirmed as being 'accurate' by the developer.	Offshore wind farm	1	311.1	307.6
W61	Walney Phase 1	Operational ²	High	Offshore wind farm	*2	409.0	422.8
W62	Walney Phase 2	Operational ²	High	Offshore wind farm	*2	413.7	427.4
W60	Walney Extension	Operational ²	High	Offshore wind farm	*2	426.6	440.0
W63	West of Duddon Sands	Operational ²	High	Offshore wind farm	*2	400.0	413.7
W64	Westermost Rough	Operational ²	High	Offshore wind farm	*2	333.8	342.2
ID (Figure 5.4.1)	Development name	Status	Confidence in assessment	Description of development	Tier 1	Distance to Rampion 2 offshore export cable corridor (km)	Distance to Rampion 2 array area (km)
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Τ1	Perpetuus Tidal Energy Centre (PTEC)	Proposed (Offshore plans approved 2016, plan to be operational 2025. Onshore planning application to be submitted 2021.)	Medium – Third-party project details published in the public domain but not confirmed as being 'accurate'	Tidal Energy	1	47.8	<50
A340	340 South East IOW Area – Volker Dredging Ltd / CEMEX UK Marine Ltd	Active ⁴	High, marine archaeology impact assessments are undertaken.	Aggregates	1	30.6	23.7
A351	351 South East IOW Area – Tarmac Marine Ltd / Volker Dredging Ltd	Active	High, marine archaeology impact assessments are undertaken.	Aggregates	1	21.2	15.8

⁴ Active aggregates licence sites are those where activities are still ongoing, hence effects arising from them may still be ongoing. In line with PINS Advice Note 17, all such sites are included in the CEA as the effects are considered to not yet be fully realised.

wood.

ID (Figure 5.4.1)	Development name	Status	Confidence in assessment	Description of development	Tier 1	Distance to Rampion 2 offshore export cable corridor (km)	Distance to Rampion 2 array area (km)
A372/1	372/1 North Nab Area – Hanson Aggregates Marine Ltd	Active	High, marine archaeology impact assessments are undertaken.	Aggregates	1	28.3	23.3
A395/1	395/1 Off Selsey Bill – Aggregates Industries UK Ltd / Kendall Bros (Portsmouth) Ltd / Tarmac Marine Ltd	Active (end date 05/03/2028)	High – Third-party project details published in the public domain and confirmed as being 'accurate' by the developer.	Aggregates	1	20.2	15
A395/2	395/2 Off Selsey Bill Area – Kendall Bros (Portsmouth) Ltd / Tarmac Marine Ltd	Active	High, marine archaeology impact assessments are undertaken.	Aggregates	1	21	16.9
A396/1	396/1 Inner Owers – Tarmac Marine Ltd	Active (end date 07/07/2030)	High – Third-party project details published in the public domain and confirmed as being 'accurate' by the developer.	Aggregates	1	0.1	0

wood.

ID (Figure 5.4.1)	Development name	Status	Confidence in assessment	Description of development	Tier 1	Distance to Rampion 2 offshore export cable corridor (km)	Distance to Rampion 2 array area (km)
A396/2	396/2 Inner Owers – Tarmac Marine Ltd	Active (end date 07/07/2030)	High – Third-party project details published in the public domain and confirmed as being 'accurate' by the developer.	Aggregates	1	2	3.5
A407	407 St Catherine's Area – CEMEX UK Marine Ltd	Active	High, marine archaeology impact assessments are undertaken.	Aggregates	1	38.6	28.4
A435/1	435/1 Inner Owers – Hanson Aggregates Marine Ltd	Active (end date 07/07/2030)	High – Third-party project details published in the public domain and confirmed as being 'accurate' by the developer.	Aggregates	1	0.7	0.1
A435/2	435/2 Inner Owers – Hanson Aggregates Marine Ltd	Active (end date 07/07/2030)	High – Third-party project details published in the public domain and confirmed as being 'accurate' by the developer.	Aggregates	1	2.3	0.7

wood.

ID (Figure 5.4.1)	Development name	Status	Confidence in assessment	Description of development	Tier 1	Distance to Rampion 2 offshore export cable corridor (km)	Distance to Rampion 2 array area (km)
A451	451 St Catherine's Area – Westminster Gravels Ltd	Active	High, marine archaeology impact assessments are undertaken.	Aggregates	1	23.5	16.5
A453	453 Owers Extension – CEMEX UK Marine Ltd.	Active (end date 31/03/2032)	High – Third-party project details published in the public domain and confirmed as being 'accurate' by the developer.	Aggregates	1	0.5	5.5
A458	458 West Bassurelle Area – Tarmac Marine Ltd / CEMEX UK Marine Ltd	Active	High, marine archaeology impact assessments are undertaken.	Aggregates	1	<50	36.4
A460	460 South Hastings Area – CEMEX UK Marine Ltd / Tarmac Marne Ltd / Hastings Aggregates Marine Ltd	Active	High, marine archaeology impact assessments are undertaken.	Aggregates	1	<50	34.8

wood.

ID (Figure 5.4.1)	Development name	Status	Confidence in assessment	Description of development	Tier 1	Distance to Rampion 2 offshore export cable corridor (km)	Distance to Rampion 2 array area (km)
A461	461 Median Deep Area – Volker Dredging Ltd	Active	High, marine archaeology impact assessments are undertaken.	Aggregates	1	<50	36.8
A464	464 West Bassurelle Area – Tarmac Marine Ltd / CEMEX UK Marine Ltd	Active	High, marine archaeology impact assessments are undertaken.	Aggregates	1	<50	33.6
A473/2	473/2 Greenich Light East Area - CEMEX UK Marine Ltd	Active	High, marine archaeology impact assessments are undertaken.	Aggregates	1	<50	25.7
A473/2	473/2 North Area - Hanson Aggregates Marine Ltd / CEMEX UK Marine Ltd	Active	High, marine archaeology impact assessments are undertaken.	Aggregates	1	<50	28.5
A474/1	474/1 North Area - Hanson	Active	High, marine archaeology impact	Aggregates	1	<50	32.9

wood

ID (Figure 5.4.1)	Development name	Status	Confidence in assessment	Description of development	Tier 1	Distance to Rampion 2 offshore export cable corridor (km)	Distance to Rampion 2 array area (km)
	Aggregates Marine Ltd		assessments are undertaken.				
A474/2	474/2 North Area - Hanson Aggregates Marine Ltd	Active	High, marine archaeology impact assessments are undertaken.	Aggregates	1	<50	37.2
A478	478 Area 1 South Area - DEME Building Materials Ltd	Active	High, marine archaeology impact assessments are undertaken.	Aggregates	1	<50	29.6
A488	488 Inner Owers North – Tarmac Marine Ltd.	Active (end date 07/07/2030)	High – Third-party project details published in the public domain and confirmed as being 'accurate' by the developer.	Aggregates	1	0.6	3.9
D1	Open disposal site - Newhaven	Open⁵	High – Third-party project details published in the public	Burial at sea	1	40.6	13.07

⁵ Open disposal sites are those where activities are still ongoing, hence effects arising from them may still be ongoing. In line with PINS Advice Note 17, all such sites are included in the CEA as the effects are considered to not yet be fully realised.

wood.

ID (Figure 5.4.1)	Development name	Status	Confidence in assessment	Description of development	Tier 1	Distance to Rampion 2 offshore export cable corridor (km)	Distance to Rampion 2 array area (km)
			domain and confirmed as being 'accurate' by the developer.				
D2	Open disposal site - Rampion 1	Open	High – Third-party project details published in the public domain and confirmed as being 'accurate' by the developer.	Disposal for the existing Rampion 1 project	1	10.5	0
D3	Open disposal site - Shoreham	Open	High – Third-party project details published in the public domain and confirmed as being 'accurate' by the developer.	Maintenance dredging	1	21.5	12.2
D4	Open disposal site - Brighton/ Rottingdean	Open	High – Third-party project details published in the public domain and confirmed as being 'accurate' by the developer.	Dredged material from Brig on Marina	1	31.6	13.1

wood.

ID (Figure 5.4.1)	Development name	Status	Confidence in assessment	Description of development	Tier 1	Distance to Rampion 2 offshore export cable corridor (km)	Distance to Rampion 2 array area (km)
D5	Open disposal site - Nab Tower	Open	High – Third-party project details published in the public domain and confirmed as being 'accurate' by the developer.	Capital and maintenance dredge material	1	25.0	17.6
D6	Open disposal site - Aquind Cable Site A	Open	High – Third-party project details published in the public domain and confirmed as being 'accurate' by the developer.	Unknown waste type	1	5.0	0
D7	Open disposal site - Aquind Cable Site B	Open	High – Third-party project details published in the public domain and confirmed as being 'accurate' by the developer.	Unknown waste type	1	32.7	16.2
C1	AQUIND (UK to France)	Proposed (assume offshore installation in 2022)	High – Third-party project details published in the public domain and confirmed	Cable	1	5.4	0

ID (Figure 5.4.1)	Development name	Status	Confidence in assessment	Description of development	Tier 1	Distance to Rampion 2 offshore export cable corridor (km)	Distance to Rampion 2 array area (km)
			as being 'accurate' by the developer.				
C2	Interconnexion France- Angleterre 2 – IFA-2 HVDC	Installed but not yet operational	High – Third-party project details published in the public domain and confirmed as being 'accurate' by the developer.	Cable	1	9.8	0.3
C3	CrossChannel Fibre ⁶	Under construction (completion date October 2021)	Low, Environmental Statement not available.	Cable	1	Unknown	Unknown
TC1	ATLANTIC CROSSING 1 Century Link	Active	Low, ES not available or does not contain marine archaeology impact assessment	Telecommunication	1	12.5	29
TC2	COWES- FAWLEY 2 BT ⁸	Active	Low, ES not available or does not contain	Telecommunication	1	<50	<50

⁶ Not shown on **Figure 5.4.1, Annex A** as this information is currently not available on any public access databases.

ID (Figure 5.4.1)	Development name	Status	Confidence in assessment	Description of development	Tier 1	Distance to Rampion 2 offshore export cable corridor (km)	Distance to Rampion 2 array area (km)
			marine archaeology impact assessment				
тсз	PORTSMOUTH RYDE BT ⁸	Active	Low, ES not available or does not contain marine archaeology impact assessment	Telecommunication	1	31.5	<50
TC5	RIOJA 2 BT	Disused	High, not used	Telecommunication	1	28	42
TC6	CIRCLE SOUTH ZAYO	In use	Low, ES not available or does not contain marine archaeology impact assessment	Telecommunication	1	34	16

2. Onshore shortlisted other developments

Table 2-1 lists the onshore 'other developments' identified for inclusion in the CEA. The locations of these other developments are also shown in **Figure 5.4.2**, **Annex A**.

Table 2-1Shortlisted other developments (onshore)

ID (Figure 5.4.2)	Development name	Status	Application reference	Applicant	Location	Description of development	Tier 7
1	A27 Arundel Bypass project	Pre- application, no scoping report yet submitted. Preferred alignment issued	No reference	Highways England	From Crossbush junction to the East of Arundel to near Yapton Lane to the west of Arundel	A new dual carriageway bypass linking together the 2 existing dual carriageway sections of the road to replace the existing single carriageway way road.	3
2	AQUIND connector	Application submitted, awaiting decision	EN020022	AQUIND Ltd	Portsmouth northwards to west of Horndean	High Voltage Direct Current ('HVDC') marine and underground electric power transmission link between the south of England and Normandy in France. Onshore cable located east of Portsmouth running northwards to west of Horndean.	1

⁷ Please refer to **Table 5-3** of **Chapter 5: Approach to EIA, Volume 2** for definition of Tiers.

ID (Figure 5.4.2)	Development name	Status	Application reference	Applicant	Location	Description of development	Tier 7
3	London to Southampton Pipeline Project	DCO granted 07/10/2020	EN070005	Esso Petroleum Company Ltd	Between Boorley Green (Hampshire) and Esso West London Terminal storage facility Hounslow	97km of new steel pipeline, approximately 300mm in diameter; a new "pigging" station at Boorley Green; associated pipeline infrastructure; and modifications to the pigging station at the Esso West London Terminal storage facility.	1
4	Ricebridge Works	Application approved 20/01/2020	DM/18/4697	Ricebridge Works	Ricebridge Works, Brighton Road, Bolney, Haywards Heath, West Sussex, RH17 5NA	Demolition of five existing industrial buildings (1,153sq.m), construction of four industrial buildings (4,253sq.m) and associated works.	1
5	Land North of Toddington Lane	Application approved (with conditions) 01/09/2015	LU/347/14/R ES	Persimmo n Homes Ltd	Land North of Toddington Lane Littlehampton BN17 7PP	Approval of Reserved Matters following Outline Application LU/47/11 for Construction of 114 dwellings and associated works.	1
6	Land South of The Littlehampton Academy	Application approved (with conditions) 28/09/2016	LU/55/15/OU T	West Sussex County Council	Land South of The Littlehampton Academy Littlehampton BN17 6DQ	Application for outline planning permission with some matters reserved for 68 dwellings (resubmission following LU/51/14/).	1





ID (Figure 5.4.2)	Development name	Status	Application reference	Applicant	Location	Description of development	Tier 7
7	Land west of Brook Lane & South of A259 Angmering	Application approved (with conditions) 15/01/2018	A/169/17/OU T	Store Property Investment s Limited	Land west of Brook Lane & South of A259 Angmering	Outline application with all matters reserved for demolition of existing buildings on site & erection of a mixed use development comprising up to 90 residential units, a care home & ancillary facilities (resubmission following A/44/17/OUT).	1
8	46a & 47 Pier Road & Land north of Clifton Road	Application approved (with conditions) 19/12/2017	LU/287/17/PL	Emsdale Residential Limited	46a & 47 Pier Road & Land north of Clifton Road Littlehampton BN17 5LW	Demolition of existing buildings, change of use & erection of 1 building (office at ground floor, 8 dwellings at first and second floor level) (0.6ha).	1
9	Land off Burndell Road Yapton	Application approved (with conditions) 13/10/2017	Y/19/16/OUT	Gleeson Developm ents Ltd	Land off Burndell Road Yapton	Outline application for the development of a maximum of 108 residential dwellings, vehicular access from Burndell Road, public open space, ancillary works & associated infrastructure.	1
10	Land South of Cornfield Close	Application approved (with conditions) 14/08/2019	LU/330/18/PL	Clarion Housing	Land South of Cornfield Close Littlehampton BN17 6LD	Demolition of existing buildings & the erection of 77 residential homes with associated access and associated infrastructure.	1

ID (Figure 5.4.2)	Development name	Status	Application reference	Applicant	Location	Description of development	Tier 7
11	Windroos Nursery	Application approved (with conditions) 05/05/2017	LU/201/16/R ES	Armon	Windroos Nursery Worthing Road Littlehampton BN17 6LY	Approval of reserved matters following outline consent LU/229/10/ for appearance, landscaping, layout & scale for 84 dwellings.	1
12	Land West of Church Lane & South of Horsemere Green Lane Climping	Application approved (with conditions) 28/09/2018	CM/1/17/OUT	Mulgrave Properties LLP	Land West of Church Lane & South of Horsemere Green Lane Climping	Outline application for the erection of up to 300 dwellings & ancillary development including open space, a building within use class D1 (Non- Residential Institutions) (up to 875 sq m), and a building for use class A1 (Shops) (up to 530 sq. m).	1
13	Cinders Nursery & Land	Application approved (with conditions) 31/08/2018	Y/5/17/OUT	Sundial Planning	Cinders Nursery & Land R/O Cinders Lane Yapton BN18 0JJ	Outline application for 51 dwellings with all matters reserved except for access.	1
14	Riverbank Business Centre	Application approved (16/06/2015), under construction.	AWDM/0935/ 13	Hyde Housing	Riverbank Business Centre Shoreham-by- Sea BN43 5FL	Outline planning application for redevelopment of general industrial land for a mixed use scheme with up to 120 new dwellings, hotel, offices and light industrial, retail, financial and professional services and cafe,	1





ID (Figure 5.4.2)	Development name	Status	Application reference	Applicant	Location	Description of development	Tier 7
						with associated roadways, parking and flood defence wall.	
15	Mannings	Application submitted, awaiting decision	AWDM/1281/ 19	Southern Housing Group	Mannings Surry Street Shoreham- By-Sea West Sussex	Demolition of existing building and structures and construction of building ranging in height from three to six storeys providing 74 residential units including car parking, cycle parking, amenity space, soft and hard landscaping and associated ancillary facilities.	1
16	63 Brighton Road	Application approved 09/08/2018	AWDM/1497/ 17	Southern Housing Group	63 Brighton Road Shoreham-by- Sea BN43 6RE	Redevelopment of the site to provide ten buildings, containing 540 new homes 2,707sqm of commercial floorspace at ground floor level, parking spaces, reconstruction of the river wall, construction of mooring pontoons and observation platform, pedestrian/cycle route, open space, access roads, cycle parking and associated ancillary areas.	1
17	Kingston Wharf	Application approved 29/01/2021	AWDM/0204/ 20	Hyde Housing	Kingston Wharf, Brighton Road,	Mixed-use redevelopment comprised of three blocks of residential dwellings (4 to 8	1

ID (Figure 5.4.2)	Development name	Status	Application reference	Applicant	Location	Description of development	Tier 7
					Shoreham-by- Sea BN43 6RN	storeys) and mixed-use business centre (office, storage and cafe uses) - incorporating riverside walk, landscaping and ancillary car and cycle parking.	
18	Shoreham Airport	Application approved 27/12/2019	AWDM/1093/ 17	Albemarle Shoreham Airport Limited	Shoreham Airport Cecil Pashley Way Shoreham (Brighton City) Airport Lancing West Sussex BN43 5FF	Outline planning permission for the erection of new commercial buildings (up to 25,000m ² of floorspace) for Light Industrial, General Industrial and Storage and Distribution with access, landscaping and associated infrastructure (including a new pumping facility on the River Adur).	1
19	Ford Energy from Waste	Application submitted, awaiting decision	WSCC/036/2 0	Grundon Waste Managem ent, Viridor Waste Managem ent	Ford Circular Technology Park, Ford Road, Ford, Arundel BN18 0XL	Demolition of existing buildings and structures and construction and operation of an energy recovery facility and a waste sorting and transfer facility for treatment of municipal, commercial and industrial wastes, including ancillary buildings, structures, parking, hardstanding and landscape works.	1



ID (Figure 5.4.2)	Development name	Status	Application reference	Applicant	Location	Description of development	Tier 7
20	Burndell Road	Application approved (with conditions) 06/08/2020	WSCC/037/1 9	TJ Waste & Recycling Limited	Burndell Road, Yapton, BN18 0HR	Proposed Inert Waste Recycling Facility, with new building, hardstanding, car parking, boundary treatment and re- aligned access to the agricultural unit.	1
21	North Farm London Road	Application approved 14/03/2019	SDNP/18/049 95/FUL	Wiston Estate	North Farm London Road (A24) Washington West Sussex RH20 4BB	Hybrid application (Part Full/Part Outline) for demolition of existing equestrian and agricultural buildings. Change of use of existing buildings and extension of existing Winery to provide enhanced storage, visitor facilities, retail and Cafe. New commercial floorspace, five self- contained holiday let units, closure of existing direct access off the A24 with associated alterations to internal roads. Provision of new permissive Public Right of Way, associated infrastructure, car parking and landscaping works (4.19ha).	1
22	Unit H6 Rudford	Application approved (with	CM/56/19/PL	Dudman Investment s Limited	Unit H6 Rudford Industrial Estate	Erection & operation of concrete batching plant to include	1

ID (Figure 5.4.2)	Development name	Status	Application reference	Applicant	Location	Description of development	Tier 7
	Industrial Estate	conditions) 29/05/2020			Ford Road Ford BN18 0BD	distribution of concrete from the facility. 2120sqm.	
23	Land North of The Rosary	Application submitted 07/09/2020, awaiting decision	DC/20/1697	Reside Developm ents Ltd.	Land North of The Rosary Church Road Partridge Green West Sussex RH13 8JS	Outline Application for the erection of 81 new dwellings and associated public open space, landscaping, vehicular access, drainage and highways infrastructure works.	1
24	Thakeham Tiles Ltd	Application approved 23/10/2019	DC/18/2095	Thakeham Concrete Products Ltd & Thakeham Trust	Thakeham Tiles Ltd Rock Road Storrington Pulborough West Sussex RH20 3AD	Outline planning application for the demolition of all existing buildings, the erection of 90 dwellings with associated works and the formation of a new access onto Rock Road.	1
25	Land North of Downsview Avenue	Application approved 15/05/2020	DC/19/2015	Welbeck Strategic Land II LLP	Land North of Downsview Avenue Storrington RH20 4LU	Outline planning application for the erection of up to 62 residential units and the creation of a new vehicle access.	1

ID (Figure 5.4.2)	Development name	Status	Application reference	Applicant	Location	Description of development	Tier 7
26	Horsham Regulation 18 consultation sites SA414 Mayfield Proposal	Proposed Local Plan site ⁸	No reference	n/a	Land North east of Henfield (Mayfield)	310ha. Around 7000 dwellings, land for gypsy and traveller accommodation, early years/new primary and secondary schools. Healthcare and other community facilities. Link road to the A23, public transport corridor, active travel corridor and transport hub.	3
27	Land west of Bridge Road Roundabout	Application submitted 03/09/2020, awaiting decision	LU/238/20/O UT	Hampton Quay Holdings	Land west of Bridge Road Roundabout, Littlehampton, BN17 5DF	Outline planning permission for demolition of existing treatment works and redevelopment of a former camp site on the edge of the River Arun to provide up to 105 homes, 100sqm of A1 Shops use, 220sqm of A3 Restaurant use and 420m of pontoons to provide approximately 32 leisure moorings along with associated landscaping, sluice gate, flood defence works, car parking and highways works, including access.	1

⁸ In general, local plan sites should only be included in the CEA if a planning application has been submitted, however due to the size and proximity of this development it has been included by exception.





ID (Figure 5.4.2)	Development name	Status	Application reference	Applicant	Location	Description of development	Tier 7
28	Land at Coombe Farm	Application approved 17/02/2017	DM/15/0644	British Solar Renewabl es	Land at Coombe Farm, Bob Lane, Twineham, West Sussex	Generation of electricity through the use of Solar Photovoltaic panels and associated infrastructure. proposed landscaping.	1
29	Land at Ford Road Arundel	Application submitted 14/12/2020, awaiting decision	AB/135/20/O UT	The Norfolk Estate	Land at Ford Road Arundel	Outline application for the development of 90 dwellings & associated amenity land.	1

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2.2 Sources

2.2.1 **Table 2-2** provides the sources of information used to identify developments to be included in the onshore CEA. These sources will be reviewed periodically as the EIA progresses to ensure that new developments which arise up until submission of the DCO Application for development consent are included in the ES.

Table 2-2 Sources of information for developments considered in onshore CEA

Data source	Website	Date reviewed for PEIR
Planning inspectorate website	https://infrastructure.planninginsp ectorate.gov.uk/projects/south- east/	11/01/2021
Energy infrastructure development applications: decisions 2018-present	https://www.gov.uk/government/c ollections/energy-infrastructure- development-applications- decisions	11/01/2021
Energy infrastructure development applications: decisions 2005-2017	https://webarchive.nationalarchive s.gov.uk/20180927103145/https:// itportal.beis.gov.uk/EIP/pages/rec ent.htm	11/01/2021
Transport and Works Act 1992 applications	https://www.gov.uk/government/gr oups/transport-and-works-act- team	11/01/2021
Arun Local Plan 2011-2031	<u>https://www.arun.gov.uk/adopted-</u> local-plan	30/09/2020
Adur Local Plan 2017	<u>https://www.adur-</u> worthing.gov.uk/adur-local-plan/	30/09/2020
Chichester Local Plan: Key Policies 2014 - 2029	<u>https://www.chichester.gov.uk/ne</u> wlocalplan	30/09/2020
Horsham District Planning Framework 2015	https://www.horsham.gov.uk/plan ning/local-plan/read-the-current- local-plan	30/09/2020
West Sussex County Council	https://www.westsussex.gov.uk/pl anning/find-a-planning- application/	11/01/2021
South Downs National Park Authority	https://www.southdowns.gov.uk/pl anning-applications/	11/01/2021



Data source	Website	Date reviewed for PEIR
Adur District Council & Worthing Borough Council (shared planning)	Data provided via GIS from Council	02/10/2020
Adur District Council & Worthing Borough Council (shared planning)	https://www.adur- worthing.gov.uk/planning/applicati ons/view/	11/01/2021
Arun District Council	Data provided via GIS from Council	09/10/2020
Arun District Council	https://www.arun.gov.uk/weekly- lists	11/01/2021
Brighton & Hove City Council (outside final search area)	Data provided via GIS from Council	03/08/2020 and 20/08/2020
Chichester District Council	Data provided via GIS from Council	07/10/2020
Chichester District Council	https://chichester.gov.uk/viewplan ningapplications	11/01/2021
Horsham District Council	Data provided via GIS from Council	22/10/2020
Horsham District Council	https://public- access.horsham.gov.uk/public- access/	11/01/2021
Lewes District Council	Data provided via GIS from Council	02/10/2020
Lewes District Council	https://planningpa.lewes.gov.uk/o nline-applications/	11/01/2021
Mid-Sussex District Council	https://pa.midsussex.gov.uk/onlin e- applications/search.do?action=si mple	11/01/2021
Highways England, A27 Arundel bypass scheme	https://highwaysengland.co.uk/our -work/south-east/a27-arundel- bypass/	11/01/2021





wood.

Annex A Figures







4.5.5



Volume 4, Appendix 5.5 Vulnerability to climate change – policy and baseline



wood.

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Relevant embedded environmental measures for climate vulnerability

Table 4-1

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1. Introduction

1.1 **Overview**

- 1.1.1 This appendix is provided in support of the Preliminary Environmental Information Report (PEIR) for Rampion 2. It should be read in conjunction with the description of the approach to the EIA provided in the **Chapter 5: Approach to the EIA**, **Volume 2** of the PEIR.
- 1.1.2 Rampion Extension Development Limited (RED) submitted a Scoping Report (RED, 2020) and request for a Scoping Opinion to the Secretary of State (SoS) (administered by the Planning Inspectorate (PINS)) on 2 July 2020 (RED, 2020). A Scoping Opinion was received on 11 August 2020 (The Planning Inspectorate, 2020). In paragraph 3.3.22 of the Scoping Opinion, the following comment was received in relation to climate change:

"Climate and Climate Change

3.3.22 The ES should include a description and assessment (where relevant) of the likely significant effects the Proposed Development has on climate (for example having regard to the nature and magnitude of greenhouse gas emissions) and the vulnerability of the project to climate change. Where relevant, the ES should describe and assess the adaptive capacity that has been incorporated into the design of the Proposed Development. This may include, for example, alternative measures such as changes in the use of materials or construction and design techniques that will be more resilient to risks from climate change."

- 1.1.3 In response to paragraph 3.3.22 of the Scoping Opinion, this appendix provides a description of the climate variables affecting the Proposed Development to establish existing and future baseline data and current understanding with regards to climate and extreme weather impacts. This appendix provides information on this data, as well as details of the policy requirements of relevance to the vulnerability of the Proposed Development to climate change. It also includes details of environmental measures that have been incorporated in the design to date to ensure resilience to climate change.
- 1.1.4 The vulnerability of the Proposed Development to climate change has been considered by the chapters listed below and environmental measures relating to climate resilience principles have been incorporated into the design. These have been described within all the following relevant chapters in the PEIR Volume 2, Appendix 27.2. Flood Risk Screening Assessment, Volume 4. Further evolution of the design of the Proposed Development will be reported in documentation supplied for planning purposes at ES and DCO Application stage (including the Design and Access Statement and the deemed marine licence). Relevant chapters of the PEIR are:
 - Chapter 6: Coastal processes, Volume 2;
 - Chapter 9: Benthic subtidal and intertidal ecology, Volume 2;
 - Chapter 11: Marine mammals, Volume 2;

- Chapter 12: Offshore ornithology, Volume 2;
- Chapter 13: Shipping and navigation, Volume 2;
- Chapter 14: Nature conservation, Volume 2;
- Chapter 19: Landscape and visual impact, Volume 2;
- Chapter 21: Soils and agriculture, Volume 2;
- Chapter 23: Terrestrial ecology and nature conservation, Volume 2;
- Chapter 24: Transport, Volume 2;
- Chapter 25: Ground conditions, Volume 2;
- Chapter 27: Water environment, Volume 2;
- Appendix 27.2: Flood Risk Screening Assessment, Volume 4; and
- Chapter 28: Major accidents and disasters, Volume 2.
- 1.1.5 From the preliminary assessment in these PEIR chapters and appendices, it can therefore be concluded that based on the environmental measures embedded in the Proposed Development's design and assumed management practices, UK climate change projections (UKCP18), and information from other environmental aspects, that the Proposed Development will not be vulnerable to climate change.
- 1.1.6 The description and preliminary assessment of the effects the Proposed Development has on climate with regards to greenhouse gas (GHG) emissions during the construction, operation and maintenance and decommissioning phases is described in **Appendix 5.2: Greenhouse gas assessment, Volume 4**.

1.2 Structure of this appendix

- 1.2.1 The remainder of this appendix is structured as follows:
 - Section 2: Legislation, policy and guidance;
 - Section 3: Baseline conditions;
 - Section 4: Climate resilient design;
 - Section 5: Glossary of terms and abbreviations; and
 - Section 6: References.

2. Legislation, policy and guidance

- 2.1.1 The United Nations Framework Convention on Climate Change (UNFCCC) is the major international body responsible for managing climate change and carbon emissions. In 2015, it adopted the Paris Agreement, the aims of which include: *"Increasing the ability to adapt to the adverse impacts of climate change and foster climate resilience and low greenhouse gas emissions development, in a manner that does not threaten food production"* (United Nations, 2015).
- 2.1.2 The UK Climate Change Act 2008 (UK Government, 2008) commits the UK to producing a Climate Change Risk Assessment (CCRA) at no longer than five yearly intervals. To date, two CCRAs have been produced (UK Government, 2012; 2017). The CCRA identified significant risks to infrastructure from flooding, rising sea levels and increases in the frequency and severity of extreme weather. It also obligates the Secretary of State to prepare the National Adaptation Programme (NAP). The NAP, produced in 2018, sets out key actions for a five-year period to adapt to the challenges of climate changes in the UK.
- 2.1.3 The National Planning Policy Framework (NPPF) sets out the Government's planning policies for England (Ministry of Housing, Communities & Local Government, 2019). It states that Local Plans "should take a proactive approach to mitigating and adapting to climate change, taking into account the long-term implications for flood risk, coastal change, water supply, biodiversity and landscapes, and the risk of overheating from rising temperatures" (Paragraph 149). Further it states that "new developments should be planned for in ways that ... avoid increased vulnerability to the range of impacts arising from climate change" (Paragraph 150).
- 2.1.4 The Environment Agency has produced guidance on the inclusion of climate change allowanced in flood risk assessments, (Environment Agency, 2020). This contains recommended percentage uplifts for climate change to be added to assessments which is addressed within Appendix 27.2: Flood Risk Screening Assessment, Volume 4.
- 2.1.5 The National Policy Statement (NPS) for Renewable Energy Infrastructure (EN-3) (Department of Energy and Climate Change, 2011a) includes considerations for renewable energy infrastructure such that it is resilient to climate change. Section 2.3 of NPS EN-3 addresses climate change adaptation for renewable energy infrastructure, specifically in relation to the Proposed Development, it states that "Offshore and onshore wind farms are less likely to be affected by flooding, but applicants should particularly set out how the proposal would be resilient to storms". Section 3 includes an assessment of changes in storm conditions that may impact the Proposed Development, and these climate projections have been considered to date in the design process.
- 2.1.6 Climate change considerations in other Energy NPSs have also been considered where relevant, for example NPS EN-1 (Department of Energy and Climate Change, 2011b) for generic considerations to ensure electricity networks infrastructure is resilient to climate change. In particular, NPS EN-1 requires the Environmental Statement (ES) to "set out how the proposal will take account of the projected impacts of climate change", which has been included in this appendix. In

line with NPS EN-1, **Section 3** provides consideration of changing climate over the "design, build, operation and, where appropriate, decommissioning of new energy infrastructure". NPS EN-1 also requires use of the latest UK Climate Projections, which are presented in **Section 3** using a high emission scenario. The design of the Proposed Development has been development with consideration of potential impacts of climate change covering the estimates lifetime of the new infrastructure.

- 2.1.7 Paragraph 2.4.1 of NPS EN-5 (Department of Energy and Climate Change, 2011c) for onshore electricity infrastructure requires new developments their resilience to flooding, effects of wind and storms on overhead lines, increase in transmission loses and earth movement or subsidence caused by flooding or drought (for underground cables). Overhead lines are not part of the Proposed Development and are therefore not considered further. Consideration of the other issues have been addressed for the Proposed Development in Volume 2, Appendix 27.2. Flood Risk Screening Assessment, Volume 4. Further evolution of the design of the Proposed Development will be reported in further documentation to be supplied for planning purposes at ES and DCO Application stage (including the Design and Access Statement).
- 2.1.8 The Environmental Impact Assessment Guide to: Climate Change Resilience & Adaptation (Institute of Environmental Management and Assessment (IEMA), 2020) provides guidance on the consideration of a project's resilience to climate change.
- 2.1.9 East Sussex County Council declared a climate emergency in 2019 and published a Climate Emergency Action Plan in June 2020 (East Sussex Council, 2020a). This action plan commits the Council to becoming carbon neutral for its own activities as soon as possible, and by 2050 at the latest. Additionally, the East Sussex Environment Strategy 2020 (East Sussex Council, 2020b) includes a commitment to remain within its science-based carbon budgets, defined as East Sussex's share of the total global carbon budget. This strategy is delivered by the Environment Board, a partnership of private, public and educational sector organisations. The contextualisation within this assessment is based on the total UK carbon budget.

Table 2-1 Local planning policy issues relevant to vulnerability to climate change

Reference	Policy issue	
Local planning policies (onshore)		
Arun Local Plan 2011-2031 (Arun District Council, 2018)	In the Arun Local Plan, the Council comments that it will support proposals which contribute to both mitigating and adapting to climate change, although it is noted that policies in the Local Plan on Climate Change, Energy Efficiency and Renewable Energy will primarily relate to the onshore elements of the Proposed Development. The Local Plan includes Policy ECC SP1 Adapting to climate change, which states that <i>"The Council will support development which is located and appropriately designed to adapt to impacts arising from climate change such as the increased probability of tidal and fluvial flooding; water</i>	

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Reference	Policy issue
	stress; health impacts as a result of extreme temperatures and a decline in the quality of habitats and richness of biodiversity". This plan has been used to support the identification of climate hazards that may affect the Proposed Development. These potential climate hazards and have been considered in the design to date to ensure resiliency.
Horsham District Planning Framework 2015 (Horsham District Council, 2015)	The Planning Framework identifies key objectives to fulfil the vision for the Horsham district, which includes Spatial Objective 12: "Ensure that new development minimises carbon emissions, adapts to the likely changes in the future climate and promotes the supply of renewable, low carbon and decentralised energy." This is supported by Strategic Policy 35: Climate Change, which includes the following statements: "Development must be designed so that it can adapt to the impacts of climate change, reducing vulnerability, particularly in terms of flood risk, water supply and changes to the district's landscape." This plan has been used to support the identification of climate hazards that may affect the Proposed Development. These potential climate hazards and have been considered in the design to date to ensure resiliency.
Draft Horsham District Local Plan 2019-2036 (Horsham District Council, 2019)	The Draft Local Plan includes Strategic Policy 37 - Climate Change proposing measures that will be required for developments to adapt to the potential impacts of climate change, including: " <i>All major development must demonstrate</i> <i>how it has been designed to adapt to the impacts of climate</i> <i>change and reduce vulnerability, particularly in terms of flood</i> <i>risk, water supply and changes to the District's landscape</i> ". This plan has been used to support the identification of climate hazards that may affect the Proposed Development. These potential climate hazards and have been considered in the design to date to ensure resiliency.
Mid-Sussex District Plan 2014-2031 (Mid-Sussex District Council, 2018)	The District Plan includes a Strategic Objective <i>"To promote development that makes the best use of resources and increases the sustainability of communities within Mid Sussex, and its ability to adapt to climate change".</i> This plan is therefore relevant to the Proposed Development as the design has considered potential impacts of climate change.
South Downs National Park Local Plan (South Downs National Park, 2019)	The South Downs Local Plan covers the entire South Downs National Park and gives consideration to the impact of climate change on the National Park. The Vision for the National Park includes " <i>adapting well to the impacts of climate change</i> ". This plan is therefore relevant to the Proposed Development as the design has considered potential impacts of climate change.

Reference	Policy issue	
Local planning policies (offshore)		
South Inshore and South Offshore Marine Plan	The South Inshore and South Offshore Marine Plan covers an area of around 20,000 km ² of inshore and offshore waters across 1,000 km of coastline from Folkestone to the river Dart. Objective 7 of the plan is "to support the reduction of the environmental, social and economic impacts of climate change, through encouraging the implementation of mitigation and adaptation measures that … Reduce vulnerability, improve resilience to climate and coastal change". This plan is therefore relevant to the Proposed Development as the design has considered potential impacts of climate change.	



3. Baseline conditions

3.1 Introduction

- 3.1.1 Current baseline conditions are determined from the following published scientific reports:
 - Met Office Southern England: Climate (Met Office, 2016); and
 - International Council for the Exploration of the Sea (ICES) Ecosystem Overviews: Greater North Sea Ecoregion (ICES, 2018).
- 3.1.2 The UK Climate Projections 2018 (UKCP18) (Met Office, 2018a) are used as the basis of future baseline assessment. UKCP18 are the *de facto* projections for use in climate change impact and adaptation assessment in the UK.
- 3.1.3 Data has been obtained from desk studies. No surveys were required for the vulnerability to climate change baseline. The most relevant UKCP18 grid square for the Proposed Development has been used to download the relevant climate data to represent the spatial scope of the future baseline. This is either a 25km², 12km² or marine grid square (Met Office, 2018a), based on the information required.
- The potential impacts of climate change are projected to increase over time. The changes in climate variables have been assessed for the '2030s' (2020 2049) and the '2060s' (2050 2079), where available in line with the construction, operation and maintenance, and its anticipated decommissioning phases of the Proposed Development. For some climate variables only data for the end of the 21st century is available.
- 3.1.5 Climate scenarios and pathways provide plausible representations of future states of the climate system, incorporating socio-economic, technological demographic and environmental development. Representative Concentration Pathways (RCP) were developed for the most recent Fifth Assessment Report (AR5) by the Intergovernmental Panel on Climate Change (IPCC) (IPCC, 2014).
- 3.1.6 The future baseline considers RCPs to understand changes in climate variables under a high/worst-case emissions scenario (RCP8.5) and a medium emissions scenario (RCP4.5).
- 3.1.7 Where data is available, climate variables for future climate conditions have been downloaded directly from UCKP18, relative to a 1981-2010 baseline. Where information is not directly available, climate risks have been assessed using a combination of variables and/or sources and information outside of UKCP18, or from technical guidance provided alongside UKCP18. Data sources are described in **Section 3.3** and **Table 3-1**.
- 3.1.8 Future baseline conditions are determined from the following published reports and research:
 - Met Office UKCP18 probabilistic projections, regional projections and marine projections (Met office, 2018a);



- Met Office UKCP09 climate projections (UK Climate Projections, 2010);
- Met Office UKCP18 Factsheets and headline finding reports (Met Office 2018b; 2018c; 2018d; 2018e; 2019);
- Intergovernmental Panel on Climate Change assessment reports (IPCC, 2014) and special reports (IPCC, 2011); and
- Peer-reviewed scientific literature (Moemken et al., 2018; Rädler et al., 2019; Tinker and Howes, 2020) and expert reports (Copernicus Climate Change Service, 2019; Marine Climate Change Impacts Partnership, 2020).
- 3.1.9 Climate variables that have been assessed as relevant to the vulnerability to climate change of the Proposed Development are:
 - changes to wind speed and direction;
 - changes to significant wave height (a term used to define characteristic height of typical ocean waves);
 - changes to air and sea surface temperatures;
 - changes to precipitation;
 - changes in lightning strikes; and
 - changes in sea level and storm surges.
- 3.1.10 The anticipated direction of change for the above climate variables are shown representing potential impacts of climate change.
- 3.1.11 Climate change is associated with a range of assumptions and limitations with respect to uncertainty. For example, there is uncertainty regarding how global climatic trends would be reflected at the regional scale. To overcome these issues, a range of projections are used from UKCP18.

3.2 Current baseline

- 3.2.1 Current climate conditions near the PEIR Assessment Boundary are described in the report '*Met Office Southern England: Climate*'. which provides a regional climate summary for land conditions in southern England (Met Office, 2016) with a focus on the latest 30 year averaging period of 1981 2010:
 - mean annual temperature along the south coast of England is ~11.5°C, which mean maxima are close to 21°C along the south coast;
 - January is the coldest month with daily minimum temperatures of about 3°C. In contrast, maximum temperatures occur in July or August and are typically associated with heat waves lasting several days;
 - coastal regions can be affected by sea breezes which result in lower maximum temperatures than further inland from late spring through the summer and milder temperatures in winter;



- annual rainfall totals vary from 550 950 mm. Periods of prolonged rainfall can lead to widespread flooding, especially in winter and early spring when soils are usually near saturation; and
- Southern England is one of the more sheltered parts of the UK. Mean wind speed and gusts (short duration peak values) are strongest in winter from December to February.
- 3.2.2 The offshore part of the Proposed Development falls in the sub-region of the Greater North Sea. The Greater North Sea is strongly influenced by the inflow of oceanic water from the Atlantic Ocean. The temperature cycle of the North Atlantic (the Atlantic Multidecadal Oscillation) affects the North Sea (ICES, 2018).

3.3 Future baseline

- 3.3.1 The anticipated direction of change for different climate variables under two climate change scenarios (RCP4.5 and RCP8.5 is shown in **Table 3-1**. The table includes an indication of the direction of change based on latest scientific understanding in terms of increases, decreases, or no distinguishable change, high uncertainty in the expected trend, or negligible change.
- 3.3.2 The future baseline is based on an anomaly change (i.e. the expected change relative to baseline conditions) or suggested trend.
- 3.3.3 The table also includes information on the qualitative level of confidence (categorised into low, medium and high) and data source. For climate variables where UKCP18 (Met Office, 2018a) probabilistic values are available, and there is agreement across the different climate models, the level of confidence is set to high. Where results from the UKCP18 (Met Office, 2018a) regional projections are available, the level is set to medium. In all other cases the level of confidence is set to low.
- 3.3.4 Overall warming seas, reduced oxygen, ocean acidification and sea-level rise are described as key risks for the future baseline in UK seas (Marine Climate Change Impacts Partnership (MCCIP), 2020). On land, the key trend is towards warmer, wetter winters and hotter, drier summers (Met Office, 2019).

Temperature

- 3.3.5 Climate change projections show trends towards warmer temperatures over both land and sea surface temperature.
- 3.3.6 Over land, projections suggest a trend towards warmer winter temperatures and hotter summer temperatures (Met Office, 2018b).
- 3.3.7 Projections of increases in sea surface temperatures over the 21st century are accompanied by a decline in sea ice formation. Most models suggest an increase of between 0.25°C and 0.4°C per decade. The Greater North Sea is anticipated to experience greater warming compared to other regions of the UK (MCCIP, 2020).
Wind speed and wind direction

- 3.3.8 Changes in wind speed and direction have a direct effect on the availability of the wind resource although future climate projections are associated with significant uncertainty (Intergovernmental Panel on Climate Change (IPCC), 2011).
- 3.3.9 Recent research has suggested evidence of increased wind speeds in Europe over the 21st century (IPCC, 2011; Rädler et al., 2019; Pryor et al, 2020). In contrast, another European climate model suggests a 3% decrease in available energy relating to wind speed changes in Europe across the 21st century (Copernicus Climate Change Service, 2019). Data from UKCP18 (Met Office, 2018a) shows negligible change in wind speed and wind direction at the onshore part of the Proposed Development over its lifetime.
- 3.3.10 Wind gusts are anticipated to increase in intensity over the 21st century (Rädler et al., 2019; Moemken et al., 2018).

Significant wave height and storm surges

- 3.3.11 Although associated with uncertainty, there are links between climate change and wind, wave and storm activity around the UK. Models and observations suggest there has been an increase in the most severe storms and significant wave heights in recent decades since 1950s in UK waters (MCCIP, 2020).
- 3.3.12 Climate scenarios project wave height to reduce slightly over the 21st century. While there is a general tendency towards lower wave heights there is no agreement in the direction of change (i.e. an increasing or decreasing signal) among model projections (Met Office, 2018c) and the most severe waves could increase in height (MCCIP, 2020).
- 3.3.13 UKCP18 data presents no significant change in future storm surges as a result of climate change. It is unknown if storm surges will become more severe, less severe or remain the same over the 21st century (Met Office, 2018d). The chance of severe storms reaching the UK may increase if tropical cyclones become more intense and their region of origin expands northwards due to sea temperature rise, although there is low confidence in these projections (MCCIP, 2020).

Sea level

- 3.3.14 Globally sea level has risen over the 20th century and will continue to rise over the coming century. Sea level is expected to continue to increase beyond 2100 even with large reductions in greenhouse gas (GHG) emissions (Met Office, 2018d). Mean sea level around the UK has risen by about 12-16cm since 1990.
- 3.3.15 Sea level rise may affect tidal characteristics although the contribution to storm surges is unlikely to change (Met Office, 2018d). Changes to tidal characteristics may include a change in tidal range, increases in wave length and wave depth (Pickering et al., 2012).

Precipitation

3.3.16 Climate projections from UKCP18 suggests that mean winter precipitation is likely to increase in the future under both a medium and high emission climate scenario.



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3.3.17 UKCP18 projections suggest a move towards warmer, wetter winters and hotter, drier summers over the 21st century. Natural variation in the climate system means that some dry winters and some wet summers will still occur. Summer rainfall reductions tend to be the largest in the south of England compared to the rest of the UK (Met Office, 2018e).

Lightning

3.3.18 Climate projections suggest an increase in the occurrence of lightning strikes across Europe over the 21st century (UK Climate Projections, 2010; Rädler et al., 2019).



Table 3-1 Future trends in climate variables for 2030s and 2060s under different climate change scenarios RCP 4.5 and RCP 8.5

Hazard		RCP 4.5		RCP 8.5		Qualitative	Data source		
		2030s	2060s	End of 21 st century	2030s	2060s	End of 21 st century	confidence	
Air temperature	Mean summer temperature	个	↑	n/a	↑	↑	n/a	High	UKCP18 – 25km² probabilistic projections
	Mean winter temperature	↑	↑	n/a	↑	↑	n/a	High	UKCP18 – 25km² probabilistic projections
	Maximum summer temperature	↑	↑	n/a	↑	↑	n/a	High	UKCP18 – 25km² probabilistic projections
	Minimum winter temperature	\uparrow	↑	n/a	↑	↑	n/a	High	UKCP18 – 25km² probabilistic projections
Sea surface temperature	Sea surface temperature	-	-	-	-	-	\uparrow	Low	Tinker and Howes, 2020
Wind	Wind speed anomaly at 10m	-	-	-	\leftrightarrow	\leftrightarrow	n/a	Medium	UKCP18 – 12km ² regional projections
	Eastward wind anomaly at 10m	-	-	-	\leftrightarrow	\leftrightarrow	n/a	Medium	UKCP18 – 12km ² regional projections



Hazard		RCP 4.5		RCP 8.5			Qualitative	Data source	
		2030s	2060s	End of 21 st century	2030s	2060s	End of 21 st century	confidence	
	Northward wind anomaly at 10m	-	-	-	\leftrightarrow	\leftrightarrow	n/a	Medium	UKCP18 – 12km ² regional projections
	Wind gusts	-	-	↑	-	-	↑	Low	Rädler et al., 2019 Moemken et al., 2018
Significant wave height and storm surges	Significant wave height	-	-	\downarrow	-	-	\checkmark	Low	Copernicus Climate Change Service, 2019
	Storm surges	-	-	-	-	-	↑	Low	Marine Climate Change Impacts Partnership, 2020
Precipitation	Mean winter precipitation	↑	\uparrow	n/a	↑	\uparrow	n/a	High	UKCP18 – 25km² probabilistic projections
	Mean summer precipitation	\downarrow	\downarrow	n/a	\downarrow	\downarrow	n/a	High	UKCP18 – 25km² probabilistic projections
Marine conditions	Sea level	\uparrow	\uparrow	n/a	\uparrow	\uparrow	n/a	High	UKCP18 – marine projections



Hazard		RCP 4.5		RCP 8.5		Qualitative	Data source		
		2030s	2060s	End of 21 st century	2030s	2060s	End of 21 st century	confidence	
Lightning	Lightning strikes	-	_	↑	-	-	\uparrow	Low	UK Climate Projections, 2010; Rädler et al., 2019

Dashes (-) indicate where data is unavailable.

The baseline analysis focuses on climate variable data for the 2030s and 2060s, the timescales that are relevant to the Rampion 2 Proposed Development. Where such data is available, data for the end of the 21st century has not been considered in the baseline analysis as it is redundant.

Trends are noted by an arrow signifying an increase \uparrow , decrease \downarrow , or no distinguishable change, high uncertainty in the expected trend, or negligible change \leftrightarrow)

4. Climate resilient design

- 4.1.1 At this stage, the description of the Proposed Development is indicative and is based on a 'design envelope' approach (see **Chapter 4: The Proposed Development, Volume 2**). This approach identifies key design assumptions whilst retaining flexibility to accommodate further refinement during detailed design.
- 4.1.2 In line with best practice, consideration of climate change has been integrated into the early stages of design. As part of the Rampion 2 design process, a number of embedded environmental measures have been adopted to reduce the potential for environmental impacts and effects as a result of climate change on the Proposed Development. This includes commitments to ensure the design considers climate change and will be built to be resilient to climate change. Relevant commitments are presented in full in **Appendix 4.1: Commitments register, Volume 4** and summarised in **Table 4-1**.
- 4.1.3 Embedded environmental measures typically include those that have been identified as good or standard practice and include actions that will be undertaken to meet existing legislation requirements. As there is a commitment to implementing these embedded environmental measures, and also to various standard sectoral practices and procedure, they are considered inherently part of the design of Rampion 2 and are set out in this PEIR.
- 4.1.4 These embedded environmental measures provide appropriate resilience, given the current level of design, to increased extreme weather as well as changes in average conditions in line with the climate scenarios presented in this Appendix. Climate change will continue to be a principle taken into consideration as the design evolves through the key subsequent stages of the design, consultation and EIA process, culminating in the ES that will accompany the DCO Application. This approach will ensure that vulnerability of the Proposed Development to climate change will be considered throughout the project design and assessment process. Therefore, actions to increase the resilience of the Proposed Development to climate will be considered further in documentation supplied for planning purposes at ES and DCO Application stage (including the Design and Access Statement and the deemed marine licence) and are not assessed separately within the PEIR.

Table 4-1 Relevant embedded environmental measures for climate vulnerability

ID	Environmental measure proposed	Project phase measure introduced	How the environmental measures will be secured	Relevance to climate vulnerability
C-11	During construction topsoil and subsoil will be stored within the temporary working corridor of the onshore cable. The topsoil and subsoil will be stored in line	Scoping – updated at PEIR	Outline COCP and DCO requirement	This measure will ensure that construction works concerning stockpiles will



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ID	Environmental measure proposed	Project phase measure introduced	How the environmental measures will be secured	Relevance to climate vulnerability
	with Defra 2009 Construction Code of Practice for the Sustainable Use of Soils on Construction Sites PB13298, including guidance on utilising separate stockpiles and giving due consideration to adverse weather conditions. Any suspected or confirmed contaminated soils will be separated, contained and tested before removed.			consider adverse weather conditions.
C-73	Drainage design to manage, attenuate and, if necessary, treat surface water run-off will be included in all elements of temporary and permanent infrastructure. These will be designed in accordance with Sustainable Drainage (SuDS) principles including allowances for climate change and discharged at pre- development rates. Where the development intersects overland flow pathways or areas of known surface water flooding appropriate measures will be embedded into the design.	Scoping – updated at PEIR	Outline COCP and DCO requirement	This measure will ensure the onshore drainage design will include consideration for climate change over its design lifetime.
C-116	The basis of the structural design for the proposed onshore cable corridor and onshore substation infrastructure will be completed in general accordance with design standards to minimise the risk of structural or geotechnical instability. The structural design of onshore	PEIR	Embedded into design of Proposed Development and Outline COCP	This measure will ensure the design of the onshore substation building will be resilient to climate change over its design lifetime.



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ID	Environmental measure proposed	Project phase measure introduced	How the environmental measures will be secured	Relevance to climate vulnerability
	substation buildings will give due consideration to minimum design requirements for ambient design temperatures, wind pressures and snow loads, including climate change allowances where appropriate.			
C-184	The contractor(s) for construction, operation and decommissioning will use a short to medium range weather forecasting service from the Met Office, or other approved meteorological data and weather forecast provider, to inform short to medium-term programme management of activities, including implementation of necessary environmental control and/or impact mitigation measures with respect to climate conditions and extreme weather events. The contractor(s) will register with the Environment Agency's flood warning service in areas of flood risk. The contractor(s) will use this information to ensure that relevant measures, including those within the Code of Construction Practice and an Environmental Management System (EMS), are implemented and, as appropriate, consider additional measures to ensure the resilience of the programme during extreme weather events.	PEIR	Outline COCP and DCO requirement	This measure will ensure that processes and activities undertaken by contractor(s) for construction, operation and decommissioning include consideration for severe weather events.

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ID	Environmental measure proposed	Project phase measure introduced	How the environmental measures will be secured	Relevance to climate vulnerability
C-185	A high-level risk assessment of severe weather impacts on the construction, operation and decommissioning process will be produced by the contractor(s) to inform mitigations. Any receptors and/or construction, operation and decommissioning related activities potentially sensitive to severe weather events, including projections for climate change, should be considered in the risk assessment.	PEIR	Outline COCP and DCO requirement	This measure will ensure that processes and activities undertaken by contractor(s) for construction, operation and decommissioning include consideration for severe weather events.
C-187	All aspects of the Proposed Development will be finished to a high standard of design with appropriate material selection, utilising best practice guidance and relevant standard including consideration for potential impacts of climate change. Concepts within relevant international and national guidance for embedding climate change into technical standards will be embedded within the further design of all assets e.g. CEN/CENELEC GUIDE 32: Guide for addressing climate change adaptation in standards (2016). This will ensure the design is resilient to climate change and able to withstand all foreseeable weather conditions during the operational life of the project. The design will use quality materials that are	PEIR	Design and Access Statement and DML conditions	This measure will ensure that all aspects of the Proposed Development will be designed with consideration for potential impacts of climate change. This will ensure the design is resilient to climate change during the lifetime of the Proposed Development.

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ID	Environmental measure proposed	Project phase measure introduced	How the environmental measures will be secured	Relevance to climate vulnerability
	resilient to climate change to avoid deterioration and minimise the need for maintenance.			
C-190	The Proposed Development will be designed incorporating the current wind loading standards, which incorporate site specific criteria based on a number of factors including wind direction, altitude and topography. WTG foundations, towers and other components will be designed at detailed design stage to withstand expected changes in climate conditions during the operational life of the Proposed Development.	PEIR	Deemed marine licence	This measure will ensure the Proposed Development is resilient to extreme weather conditions for winds.
C-193	Replacement planting should be characteristic of the area and resilient to climate change. Plant species will be selected carefully at detailed design stage with appropriate management and maintenance techniques established to support the development of these species in line with the environmental requirements.	PEIR	Outline Landscape and Ecology Management Plan	This measures will ensure that replacement planting for the Proposed Development is resilient to climate change.



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5. Glossary of terms and abbreviations

Table 5-1 Glossary of terms and abbreviations

Term	Description
Adaptation	The process of adjustment in a design or operational procedure to respond to the projected impacts of climate change, in order to moderate harm or exploit beneficial opportunities.
AR5	Fifth Assessment Report
CCRA	Climate Change Risk Assessment
Climate	Climate is usually defined as the average weather over a period of time ranging from months to thousands or millions of years. The classical period for averaging these variables is 30 years, as defined by the World Meteorological Organization. Weather factors often considered in climate are surface variables such as temperature, precipitation and wind.
Extreme weather event	A weather event that is as rare as or rarer than the 10th or 90th percentile of a probability density function estimated from observations for a specific place and time of year. By definition the characteristics of what is called extreme weather may vary from place to place in an absolute sense.
GHG	Greenhouse gas
Greater North Sea	The Greater North Sea is located on the continental shelf of north-west Europe. It opens into the Atlantic Ocean to the north and to the south-west, via the English Channel. It is connected to the Baltic sea to the east.
Heatwave	A heatwave is an extended period of hot weather relative to the expected conditions of the area at that time of year, which may be accompanied by high humidity. A UK heatwave threshold is met when a location records a period of at least three consecutive days with daily maximum temperatures meeting or exceeding the heatwave temperature threshold. In East Sussex, the threshold value is 27°C.
IPCC	Intergovernmental Panel on Climate Change
MCCIP	Marine Climate Change Impacts Partnership
NAP	National Adaptation Programme
NPPF	National Planning Policy Framework



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Term	Description
NPS	National Policy Statement
Preliminary Environmental Information Report (PEIR)	The written output of the Environmental Impact Assessment undertaken to date for the Proposed Development. It is developed to support formal consultation and presents the preliminary findings of the assessment to allow an informed view to be developed of the Proposed Development, the assessment approach that has been undertaken, and the preliminary conclusions on the likely significant effects of the Proposed Development and environmental measures proposed.
PINS	The Planning Inspectorate
Representative Concentration Pathway (RCP)	Future pathways based on emissions and concentrations of greenhouse gases. Each RCP provides only one of many possible scenarios that could lead to specific forcing mechanisms.
RCP4.5	Medium emissions scenario. This scenario uses a Representative Concentration Pathway defined by the Intergovernmental Panel on Climate Change's latest 5th Assessment Report. Representative Concentration Pathway 4.5 specifies the concentration of greenhouse gases that would result in 4.5 W/m2 radiative forcing at the top of the atmosphere by 2100, relative to pre-industrial levels. The increase of global mean surface temperature by the end of the 21st century (2081– 2100) relative to 1986–2005 is likely to be 1.1°C to 2.6°C under RCP4.5.
RCP8.5	High/worst-case emissions scenario. This scenario uses a Representative Concentration Pathway defined by the Intergovernmental Panel on Climate Change's latest 5th Assessment Report. Representative Concentration Pathway 8.5 specifies the concentration of greenhouse gases that would result in 8.5 W/m2 radiative forcing at the top of the atmosphere by 2100, relative to pre-industrial levels. The increase of global mean surface temperature by the end of the 21st century (2081– 2100) relative to 1986–2005 is likely to be 2.6°C to 4.8°C under RCP8.5.
Rampion Extension Development Ltd. (RED)	RED is the Applicant for the Rampion 2 Development Consent Order.
Scoping Opinion	A Scoping Opinion is adopted by the Secretary of State for a Proposed Development.



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Term	Description
Scoping Report	A report that presents the findings of an initial stage in the Environmental Impact Assessment process.
RCP	Representative Concentration Pathways
SuDs	Sustainable drainage systems
UKCP18	UK Climate Change Projections 2018. UK Climate Projections 2018 is the most up-to-date assessment of how the climate of the UK may change over the 21st century, recently updated in 2018. UK Climate Projections 2018 uses climate science to provide observations and climate change projections for the UK and globally until 2100.
Vulnerability	The propensity or predisposition of a system or receptor to be adversely affected. This encompasses the sensitivity of the system or receptor and its capacity to cope and adapt.
Weather	Short term variations in the state of the atmosphere at a particular place and time in regard to heat, cloudiness, dryness, sunshine, winds, rain, etc.



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