

Volume 2, Chapter 3: Alternatives

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3. Alternatives

3.1 Introduction

- 3.1.1 This chapter considers the reasonable alternatives to the Proposed Development. It presents the design evolution process followed to-date, explains the outcomes of the process which have led to the refinement of the PEIR Assessment Boundary, and explains the environmental and other considerations which have been taken into account. The PEIR Assessment Boundary combines the Areas of Search for the offshore and onshore infrastructure associated with the Proposed Development. It is defined as the area within which the Proposed Development and associated infrastructure will be located, including the temporary and permanent construction and operational work areas.
- 3.1.2 By way of context, it is a requirement of The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (the 'EIA Regulations 2017') that the Environmental Statement (ES) submitted with the Application for development consent should include: 'a description of the reasonable alternatives studied by the applicant, which are relevant to the proposed development and its specific characteristics, and an indication of the main reasons for the option chosen, taking into account the effects of the development on the environment" (regulation 14(2)(d))'.
- 3.1.3 **Chapter 2: Policy and legislative context** sets out the underlying and supporting documentation for development of offshore wind energy development. The information provided in this chapter will be updated for inclusion in the ES in accordance with the EIA Regulations 2017 and other relevant legislation as the design of the Proposed Development evolves. The design process for the Proposed Development has taken full consideration of the National Policy Statement (NPS) for Energy (EN-1) (DECC, 2011a), the National Policy Statement (NPS) for Renewable Energy (EN-3) (DECC, 2011b), the National Planning Policy Framework (NPPF) (Ministry of Housing, Communities and Local Government, 2019), and Design Principles for National Infrastructure (National Infrastructure Commission, 2020).
- 3.1.4 Section 4.4 of NPS EN-1 indicates the need to present the main alternatives considered as part of the Proposed Development and to demonstrate consideration of environmental, social and economic effects including, where relevant, technical and commercial feasibility (paragraph 4.4.2).
- 3.1.5 Section 4.5 of NPS EN-1 sets out the principles of good energy infrastructure design. Paragraph 4.5.4 indicates that a project Application should be able to demonstrate how the design process was conducted and how the proposed design evolved. Where multiple design options were considered, the Applicant should set out the reasons for the selection of chosen option. NPS EN-1 also highlights the importance of good design in terms of siting relative to the existing landscape character, landform and vegetation which the Applicant should demonstrate (paragraph 4.5.3).
- 3.1.6 Section 2.4 of NPS EN-3 indicates that renewable energy proposals should demonstrate good design in relation to landscape and visual amenity whilst also

demonstrating how design has evolved to mitigate impacts such as noise and effects on ecology (paragraph 2.4.2).

- 3.1.7 NPS EN-3 also addresses the need for flexibility in the Application process for offshore wind NSIPs to allow for situations where full parameters of the project may be unknown at the time of submission (NPS EN-3, paragraph 2.6.43). In such instances, EN-3 recommends the use of the 'Rochdale Envelope' method which allows for the maximum adverse and positive scenario to be assessed in the EIA and a DCO granted on this basis (NPS EN-3, paragraph 2.6.43).
- 3.1.8 Section 127 of the NPPF sets out the design considerations helping decisionmaking for developments and indicates that developments:

a) will function well and add to the overall quality of the area, not just for the short term but over the lifetime of the development;

b) are visually attractive as a result of good architecture, layout and appropriate and effective landscaping;

c) are sympathetic to local character and history, including the surrounding built environment and landscape setting, while not preventing or discouraging appropriate innovation or change (such as increased densities);

d) establish or maintain a strong sense of place, using the arrangement of streets, spaces, building types and materials to create attractive, welcoming and distinctive places to live, work and visit;

e) optimise the potential of the site to accommodate and sustain an appropriate amount and mix of development (including green and other public space) and support local facilities and transport networks; and

f) create places that are safe, inclusive and accessible and which promote health and well-being, with a high standard of amenity for existing and future users; and where crime and disorder, and the fear of crime, do not undermine the quality of life or community cohesion and resilience.

- 3.1.9 The NPPF recommends early discussions between applicants, the relevant local planning authorities and local community, and consideration of the community's point of view regarding the design and style of the emerging scheme (paragraph 128).
- 3.1.10 The Proposed Development takes into consideration the Design Principles for National Infrastructure (National Infrastructure Commission, 2020). This guidance identifies four principles to guide the planning and delivery of major infrastructure projects: climate, people, places and value. The National Infrastructure Commission's Design Group developed the principles in consultation with all infrastructure sectors. They are intended to be applied to all economic infrastructure, including: digital communications, energy, transport, flood management, water and waste. As a renewable energy development, Rampion 2 follows the four principles of this guidance. Climate, people, places and value are considerations that have informed the design of the onshore offshore components of the Proposed Development.
- 3.1.11 Throughout the design development phase for the Proposed Development, prior to the publication of this Preliminary Environmental Information Report (PEIR), full

consideration has been given to reasonable alternatives. This is both for the technical engineering design as well as for the siting options. The remainder of this chapter is structured as follows:

- Section 3.2: Approach to design evolution describes the approach to the design evolution process that has been applied to develop the Rampion 2 design;
- Section 3.3: Offshore site selection describes the identification of the offshore design elements undertaken so far, and indicates the development that has occurred since the Scoping stage;
- Section 3.4: Onshore site selection describes the identification of the onshore design elements undertaken so far, and indicates the development that has occurred since the Scoping stage;
- Section 3.5: Alternative Technologies describes other technologies and approaches that have been considered and the reasons that these have not been selected;
- Section 3.6: PINS Scoping Opinion responses sets out the Planning Inspectorate's Scoping Opinion responses that are relevant to the consideration of alternatives and how these have been responded to in this PEIR;
- Section 3.7: Next steps describes the next steps that are to be taken in the design evolution process to achieve a final design for the DCO Application;
- Section 3.8: Glossary of terms and abbreviations; and
- Section 3.9: References sets out the references used in this chapter.

3.2 Approach to design evolution

Introduction

- 3.2.1 The design evolution process adopted for Rampion 2 is a fundamental element of the EIA. The process is iterative and has led to opportunities for the development of environmental measures which have been embedded directly into the design of Rampion 2. These are referred to as 'embedded environmental measures' (discussed in further detail in **Chapter 5: Approach to the EIA**). The process has involved engagement, providing opportunities for stakeholders to provide feedback and to understand and influence the design as it progresses. This will continue to develop for the ES and the Application for development consent.
- 3.2.2 From the outset the environment has been central to the design of Rampion 2, and at the PEIR stage this is demonstrated through the further development of the Commitments Register initially presented in the Scoping Report (RED, 2020).

Commitments Register

3.2.3 As part of the ongoing EIA process, Rampion Extension Development Ltd (RED) has built on the Commitments Register which was established at the Scoping stage. The register identifies environmental measures that RED will implement as

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part of the Proposed Development and that will be embedded into design. The commitments that are relevant to individual aspect assessments are outlined in **Chapters 6** to **28**. The Commitments Register is presented in full in **Appendix 4.1: Commitments Register**, **Volume 4**.

3.2.4 The Commitments Register contains a range of embedded environmental measures including proposed avoidance measures which have been informed by the ongoing design evolution process, best practice commitments which were adopted as part of the existing Rampion 1 project, and/or are considered to be sectoral practices and procedures for NSIPs and in particular offshore wind farm development. An example is at sensitive crossing locations the construction working width will be reduced as far as practicable. Several commitments have informed the design evolution through avoidance of sensitive receptors where possible, or through commitments to use techniques such as Horizontal Directional Drilling (HDD) to reduce impact on sensitive receptors. Those that are applicable to site selection and consideration of alternatives are set out in **Table 3-1**.

Table 3-1 Relevant embedded environmental measures to design evolution

ID	Environmental measure proposed	Project phase measure introduced	How the environmental measures will be secured
C-1	The onshore cable route will be completely buried underground for its entire length where practicable.	Scoping	Development Consent Order (DCO) works plans, description of development and requirements
C-3	At sensitive crossing locations the working width will be reduced as far as practicable.	Scoping	DCO works plans, description of development and requirements
C-4	Horizontal Directional Drill (HDD) technique will be used at the landfall location.	Scoping	DCO works plans, description of development and requirements
C-5	Main rivers, watercourses, railways and roads that form part of the Strategic Highways Network will be crossed by Horizontal Directional Drill (HDD) or other trenchless technology where this represents the best environment solution and is financially and technically feasible (see C-17).	Scoping – updated at PEIR	DCO works plans and order limits
C-6	Where practical, sensitive sites will be avoided by the temporary and permanent onshore project footprint including Sites of Special Scientific Interest (SSSIs), Local Nature Reserves, Local Wildlife Sites, ancient woodland, areas of consented development, areas of historic and authorised landfill and other known areas of potential contamination, National Trust Land, Listed Buildings, Scheduled monuments, and mineral resources (including existing mineral sites, minerals sites allocated in development plans and mineral safeguarding areas).	Scoping – updated at PEIR	DCO works plans and order limits

ID	Environmental measure proposed	Project phase measure introduced	How the environmental measures will be secured
C-10	No blasting is anticipated to be required and trenchless crossings will be undertaken by non-impact methods.	Scoping	Outline COCP and DCO requirement
C–17	Where trenchless techniques are not required or are not practical, watercourses may be crossed by open cut techniques (with flows overpumped around the working area). Appropriate environmental permits or land drainage consents will be applied for works from the Environment Agency (e.g. for Main Rivers, works on or near sea defences/flood defence structures or in a flood plain) or from the Lead Local Flood Authority (LLFA) (for Ordinary Watercourse crossings) (see C-5).	Scoping – updated at PEIR	Outline COCP and DCO requirement
C–20	The typical construction working area will be 50m along the onshore cable corridor to minimise the construction footprint. At other discrete locations this may be expanded to accommodate working area for example for Horizontal Directional Drilling (HDD).	Scoping	Outline COCP and DCO requirement
C–23	Where possible micrositing will be undertaken during detailed design to avoid ponds.	Scoping	Outline COCP and DCO requirement
C–36	The number of wind turbine generators (WTGs) will not exceed that of the existing Rampion 1 project.	Scoping	DCO requirements or Deemed Marine Licence (DML) conditions.
C–37	Maximum blade tip height is 325m from LAT and rotor diameter of 295m.	Scoping – updated at PEIR	DCO requirements or DML conditions.
C-38	The selection of the foundation type will primarily be based upon the site conditions combined with the wind turbine generator (WTG) that	Scoping	DCO requirements or DML conditions.



ID	Environmental measure proposed	Project phase measure introduced	How the environmental measures will be secured
	is selected. The following foundation types are being considered: Monopile and Jacket.		
C-40	There will be up to three offshore substations installed to serve the Proposed Development. The exact locations, design and visual appearance will be subject to a structural study and electrical design, which is expected to be completed post consent. The offshore substations will be installed on jacket or monopile foundations, similar to those described for the wind turbine generators (WTGs) themselves.	Scoping	DCO requirements or DML conditions.
C-42	The inter-array cables and the subsea export cables will be installed using one or a combination of the three methods: ploughing, trenching or jetting. It is likely that a combination of these methods will be adopted for localised areas depending on seabed conditions. The installation methods will be selected during detailed design and tendering phases.	Scoping	DCO requirements or DML conditions.
C-43	The subsea export cable ducts will be drilled underneath the beach using horizontal directional drilling (HDD) techniques.	Scoping	DCO requirements or DML conditions.
C-45	Where possible, subsea cable burial will be the preferred option for cable protection. Cable burial will be informed by the cable burial risk assessment and detailed within the Cable Specification Plan.	Scoping	DCO requirements or DML conditions.
C-60	All intrusive construction activities will be routed and microsited to avoid any identified marine heritage receptors pre-construction, with Archaeological Exclusion Zones (AEZs) (buffers) as detailed in the	Scoping – updated at PEIR	DCO requirements or DML conditions.



ID	Environmental measure proposed	Project phase measure introduced	How the environmental measures will be secured
	Outline Marine Written Scheme of Investigation (WSI) unless other mitigation is agreed with Historic England as per the WSI.		
C-61	Due regard will be given to design principles held in Rampion 1 Design Plan and design principles to be developed for Rampion 2, with consideration of the seascape, landscape and visual impacts on the South Downs National Park and Sussex Heritage Coast	Scoping – updated at PEIR	DCO requirements or DML conditions.
C-65	The proposed offshore cable corridor and cable landfall (below mean high water springs [MHWS]) will avoid all statutory marine designated areas.	Scoping	DCO requirements or DML conditions.
C-67	The onshore cable route will avoid the brows of hills as far as is reasonably practical and is likely to follow the established pattern of the landscape i.e. routed to closely follow the line of existing field boundaries as far as is practicable.	Scoping	DCO works plans, description of development and requirements
C-75	Construction and permanent development in flood plains will be avoided wherever possible. Where this is not possible (for example, the landfall location) environmental measures will be developed to ensure the works are National Policy Statement compliant, including a sequential approach to siting of infrastructure and passing the Exception Test where appropriate.	Scoping – updated at PEIR	Outline COCP and DCO requirement
C–78	Licensed and private water supplies will be avoided where practicable; if any impacts are anticipated then appropriate measures will be put in place to avoid impact on the quantity and quality of the supply.	Scoping	Outline COCP and DCO requirement



ID	Environmental measure proposed	Project phase measure introduced	How the environmental measures will be secured
C-89	There will be a minimum blade tip clearance of at least 22m above highest astronomical tide (HAT).	Scoping	Secured in the description of the development
C-96	Subsea array and export cables will be installed via either ploughing, jetting, trenching, or post-lay burial techniques, to a target burial depth of 1m.	Scoping	DCO requirements or DML conditions.
C-112	No ground-breaking activity or use of wheeled or tracked vehicles will take place within the Littlehampton Golf Course and Atherington Beach Local Wildlife Site (LWS) unless remedial action is required. Any predicted activity will be restricted to foot access for the purpose of surveying and monitoring of the progress of the horizontal directional drill (HDD).	PEIR	Outline COCP and DCO requirement
C-113	The construction corridor through the Warningcamp Hill and New Down Local Wildlife Site (LWS) will be narrowed to no more than 30m for its entire length. A method statement for the Warningcamp Hill and New Down LWS will be written and agreed with the South Downs National Park Authority and West Sussex County Council.	PEIR	Outline COCP and DCO requirement
C-114	Sullington Hill Local Wildlife Site will be crossed using a trenchless method such as Horizontal Directional Drill (HDD).	PEIR	Outline COCP and DCO requirement
C-115	The construction corridor through woodland, tree lines and across important hedgerows (in terms of the Hedgerows Regulations 1997) will be narrowed to no more than 30m for its entire length to minimise habitat losses. All hedgerows will be reinstated following cable installation.	PEIR	Outline COCP and DCO requirement



ID	Environmental measure proposed	Project phase measure introduced	How the environmental measures will be secured
C-122	All permanent cable crossings will pass beneath the bed of watercourses (no within bank crossings). Sufficient depth between the bed of the watercourse and the top of the cable (whether trenchless or open cut) will be provided to ensure no potential for exposure of cable due to scour. The minimum depth of cable (top) beneath 'true cleaned bed' of the watercourses is to be advised at ES stage.	PEIR	Outline COCP and DCO requirement
C-123	Starter (and exit) pits for Horizontal Directional Drilling (HDD) and other trenchless technologies will be micro-sited outside of the floodplain where possible (by moving the pits further away from watercourses).	PEIR	Outline COCP and DCO requirement
C-125	Where the cable route crosses an Environment Agency flood defence, trenchless methodologies will be used.	PEIR	Outline COCP and DCO requirement
C-137	All proposed infrastructure and construction activities will be sited outside of the inner Source Protection Zones (SPZ1) for the Southern Water Warningcamp and Burpham borehole public water supplies. Construction activities will also be steered as far as practicable outside of their respective SPZ2s, and there will be no drilling activities or storage of hazardous materials including chemicals, oils and fuels within any SPZ.	PEIR	Outline COCP and DCO requirement
C-154	Within the fluvial floodplain and at surface water flow pathways, the permanent cables will be completely buried, with the land above reinstated to pre-construction ground levels (some mounding may be appropriate to allow for settlement).	PEIR	DCO works plans, description of development and requirements



ID	Environmental measure proposed	Project phase measure introduced	How the environmental measures will be secured
C-155	Potential Annex I habitats ¹ will be avoided where possible.	PEIR	DCO / Deemed ML requirement
C-157	The proposed heavy goods vehicle (HGV) routing during the construction period to individual accesses will be developed to avoid major settlements such as Storrington, Cowfold, Steyning, Wineham, Henfield, Woodmancote and other smaller settlements where possible.	PEIR	Proposed routing in agreed CTMP
C-158	The proposed heavy goods vehicle (HGV) routing during the construction period to individual accesses will avoid the Air Quality Management Area (AQMA) in Cowfold where possible.	PEIR	Proposed routing in agreed CTMP
C-159	The proposed heavy goods vehicle (HGV) routing during the construction period to individual accesses will avoid the A24 through Findon as advised from the West Sussex County Council (WSCC) Freight Action Plan.	PEIR	Proposed routing in agreed CTMP

¹ Habitats protected under Annex I of the EC Directive 92/43/EEC on Conservation of Natural Habitats and Wild Fauna and Flora, 1992 (the 'Habitats Directive').

Design evolution process

3.2.5 The key elements of the design evolution process and how they correspond and link with the stages of the Rampion 2 EIA are illustrated in **Graphic 3-1**. Engagement with stakeholders has been key throughout the process, and further details on where engagement has influenced design is discussed in **Section 3.3**: **Offshore site selection** and **Section 3.4**: **Onshore site selection**.





- 3.2.6 The Scoping Report (RED, 2020) was based on a Scoping Boundary which at that early stage of the Proposed Development combined the Areas of Search for the offshore and onshore infrastructure associated with Rampion 2. It was defined as the area within which the Proposed Development and associated infrastructure would be located, including the temporary and permanent construction and operational work areas. A summary of the design evolution work and reasonable alternatives considered that led to the development of the Scoping Boundary were set out in the Scoping Report (RED, 2020), and a summary is provided in this chapter for offshore in **Section 3.3** and for onshore in **Section 3.4**.
- 3.2.7 Further design evolution has occurred since the Scoping stage. Activities have been aimed at ensuring that safeguarding the environment is central to the design of the Proposed Development from the outset and have included the following

activities to propose alternatives, optimisations and to reduce and refine the Scoping Boundary both onshore and offshore:

- updating of constraints mapping as new environmental information became available;
- analysis of information collected from EIA surveys;
- identification of technical construction challenges;
- collaborative working with technical environmental specialists and engineers;
- detailed review of land ownership; and
- engagement with stakeholders.
- 3.2.8 This process has resulted in the reduction of the Scoping Boundary to the PEIR Assessment Boundary (**Figure 1.1, Volume 3**). Onshore this has included a reduction in the boundary and the consideration of numerous cable routeing options to avoid as many environmental sensitivities as possible which is further explained in **Section 3.4**. Reductions in the boundary have also been made offshore which is further explained in **Section 3.3**.

3.3 Offshore site selection

Offshore wind farm area of search

- 3.3.1 In 2018, The Crown Estate (TCE) invited the owners of existing Round 3 wind farms to consider potential extensions of those schemes. Rampion Offshore Wind Limited (the owner of Rampion 1) applied to TCE for an extension to Rampion 1 through this wind farm extension leasing process. Following the outcome of TCE's plan-led Habitats Regulations Assessment (HRA), a new company Rampion Extension Development Limited (RED) was set up and was awarded the development rights for Rampion 2 in September 2019.
- 3.3.2 As part of the offshore wind farm site selection process for Rampion 2, detailed assessments and evaluations of potential developable areas were undertaken to ensure the best possible site could be brought forward. This considered areas in proximity to the existing project under the TCE Extensions Round process, and also the remaining parts of the TCE Round 3, Zone 6 area. These are residual areas not included within the Rampion 1 Application at the time of TCE Round 3 in 2013, and the additional areas consented as part of the Rampion 1, but which were not developed as part of the original scheme.
- 3.3.3 The Round 3 area within which Rampion 1 was brought forward (Zone 6) was one of nine Zones identified following a process of national, strategic level planning initiated in 2008, and represented a critical component of the UK's response to meeting international and national renewable energy targets and commitments. As part of the wider national strategic initiative, a Strategic Environmental Assessment (SEA) of suitable areas for offshore wind development was conducted by the then Department of Energy and Climate Change (DECC), which completed in 2009. Development rights for the zones were not awarded until the completion of the SEA.

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- 3.3.4 Rampion 1 was designed with a focus on achieving the most efficient and costeffective project at that time. The completed wind farm occupies approximately 72km² within the total 139km² consented area, with 300MW capacity headroom left undeveloped from the original consented maximum. Substantial progress has been made in the offshore wind industry in the period since the original project design was optimised in 2014. This includes advances in project economics, technology and understanding such as construction approaches, design, and social and environmental effects. A re-evaluation of areas within the wider Zone 6, and the surplus part of the area consented under the Rampion 1 DCO, was therefore carried out.
- 3.3.5 The consideration of environmental parameters and other constraints has been a central theme of site selection (see **paragraphs 3.3.8** and **3.3.9**). The site selection assessments have been supported by detailed consideration of the findings of the original Rampion 1 EIA and its subsequent Examination process, together with the knowledge and understanding gained through the post-consent and construction phases of Rampion 1. All of these have provided additional insight and understanding of the relevant environmental sensitivities and the range of other constraints applicable for the extension proposals.
- 3.3.6 An initial development boundary was identified based on the combination of these areas, and the identification of a proposed Rampion 2 project within this Area of Search. This ensures evidence-supported potential for successful development, whilst retaining sufficient flexibility to respond to additional constraints identification that may arise through the ongoing detailed assessment phases, as well as stakeholder feedback. On this basis, the Rampion 2 Scoping Boundary comprises both the seabed area awarded under the TCE extension process and areas within the remainder of the original Round 3 Zone 6 extents.
- 3.3.7 Based on an initial assessment of environmental parameters and constraints, an Area of Search was identified as a preliminary offshore boundary of the Rampion 2 offshore wind farm area. For the Scoping Boundary this included analysis of engineering, environmental, economic and consenting risks and was then subject to further feasibility analysis for key areas of concern.
- 3.3.8 Key feasibility concerns for the wind farm area initially included consideration of:
 - navigation risk, including the approaches to the Solent and proximity to the Dover Strait Traffic Separation Scheme;
 - landscape/seascape, visual and heritage (by locating the area of search no closer to shore than the existing Rampion 1 project);
 - the biological environment and ecology (including protected sites and designations);
 - socio-economics (including recreational sea users, and commercial interests such as fishing and marine aggregate dredging);
 - ground conditions and bathymetry including water depth; and
 - wind resource and engineering aspects.
- 3.3.9 In parallel with this, existing environmental 'hard constraints' were considered, based on spatial data and an understanding of the likely constraints, including:

- disposal sites;
- completed, drilled, plugged and abandoned, and suspended oil and gas wells;
- active subsurface structures;
- surface structures with helipads;
- International Maritime Organisation (IMO) shipping routes;
- consented developments;
- wrecks;
- active pipelines; and
- active cables.
- 3.3.10 The offshore wind farm area of search overlaid with shipping areas and Marine Conservation Zones (MCZs) is illustrated in **Figure 3.1**, **Volume 3.** Identification of this area considered the following factors:
 - this area is wholly within that originally considered by the Strategic Environmental Assessment (SEA) in 2008/2009;
 - the northern boundary maintains a minimum 13km distance from shore, as per the existing Rampion 1 project;
 - the eastern boundary extends no further eastwards than the original consented boundary in the Rampion 1 DCO; and
 - the southern and western boundaries were selected following analysis of shipping patterns to avoid the main vessel routes together with avoidance of the Offshore Overfalls Marine Conservation Zone (MCZ) to the south west and appropriate separation from the Dover Strait Traffic Separation Scheme (TSS) to the south east.
- 3.3.11 In addition, a marine cable link area to adjoin the two areas at the Rampion 1 south west corner was also added to the Scoping Boundary to enable cabling requirements across the full area. For clarity, no WTGs or substations will be located in the marine cable link area.
- 3.3.12 The aggregate of these seabed areas has been further optimised since the Scoping stage, and this is set out in **paragraphs 3.3.21** to **3.3.29**.

Offshore export cable corridor

3.3.13 A broad offshore export cable corridor (ECC) has been defined between the offshore wind farm and a landfall at Climping, West Sussex. The selection of the export cable corridor route, connecting the offshore wind farm to the onshore elements of Rampion 2, was primarily driven by the selection of the landfall site at Climping. The process by which Climping was identified as the proposed landfall point is set out in detail in **Section 3.4**. The selection of Climping was the culmination of feasibility work evaluating a number of possible grid connection, cable route corridor and landfall combinations.

- 3.3.14 In seeking the most appropriate route to link the offshore part of the Proposed Development with the onshore export cable route at Climping, a number of design principles have been applied to the offshore export cable corridor. These aim to minimise potential impacts associated with the installation and presence of the export cables and steer the decision-making process throughout. Initially these comprised:
 - avoiding key sensitive features where possible and where not, seeking to mitigate impacts;
 - minimising potential disruption to populated areas; and
 - identifying the shortest route as a preference for cable routing to minimise cost, construction timescales, and transmission losses.
- 3.3.15 These guiding principles have been applied alongside, and are compatible with, The Crown Estate's Cable Route Protocol (CRP) (The Crown Estate, 2019), which provides the overarching guidance and requirements for the identification of an appropriate and acceptable ECC.
- 3.3.16 The CRP sets out principles and requirements for offshore wind developers in the planning of offshore export cable routes. Compliance with these principles and requirements is secured within the offshore array Agreement for Lease (AfL). Compliance with these requirements must be demonstrated within the Corridor Identification and Approval for Linear Activities (CIAL) document which will accompany an Application to The Crown Estate for a transmission assets AfL. All the principles and requirements within the CRP are relevant to the site selection process, but of particular relevance are the following:
 - Principle 3: This principle makes it clear that the "Cable Route Protocol applies specifically to Habitats Regulations Sites", however it should be taken to include all other protected sites and sensitive habitats.
 - Requirement 9: This requirement sets out what constraints must be mapped during the site selection process, namely: Habitats Regulations sites and features of these sites, areas of Annex I habitats and irreplaceable habitats. Requirement 9 also makes it clear that consultation with the relevant Statutory Nature Conservation Body should be undertaken at this stage.
 - Requirement 10: This requirement makes it clear that design parameters of possible cabling infrastructure, including number and capacities of the export cables with their indicative spacing requirements and the additional structures, should be included within the site selection process.
- 3.3.17 The consideration of the shortest route between the offshore wind farm area of search and the landfall point focused the ECC area of search on the northern boundary of Rampion 2 (see first image in **Figure 3.2, Volume 3**).
- 3.3.18 Engineering and environmental constraints were also considered and this led to a focus on the western part of the Proposed Development area, west of the existing Rampion 1 footprint to avoid the need to cross the Rampion 1 export cables (see second image in **Figure 3.2, Volume 3**).
- 3.3.19 The ECC route design was then moved further west to avoid direct interaction with the Kingmere Rocks Marine Conservation Zone (MCZ) (see third image in **Figure**

3.2, Volume 3). Care was also taken to ensure avoidance of other known constraints as the western route was refined, including:

- avoidance of the Site of Special Scientific Interest (SSSI) designation at eastern part of landfall, 'Climping Beach';
- further avoidance of Kingmere Rocks MCZ to the east of the export corridor; and
- avoidance of active aggregates extraction licence areas to the east of the export corridor.
- 3.3.20 Further refinements to the ECC area of search were made following scoping to take account of engineering requirements.

Offshore refinement since the Scoping stage

- 3.3.21 The design refinement process delivering the offshore part of the PEIR Assessment Boundary was informed by two workshops which brought together technical engineering and environmental specialists.
- 3.3.22 Early stakeholder engagement and the Scoping Opinion highlighted potential concerns regarding ornithology, seascape landscape and visual impacts (SLVIA) and shipping and navigational risk that may be addressed through refinement of the offshore element of the Scoping Boundary.
- 3.3.23 Shipping and navigation issues included the proximity of the boundary to the Dover Strait Traffic Separation Scheme (TSS) which posed a potential navigation safety

Workshop 1: Review of stakeholder engagement feedback received via the Scoping Opinion Response (see **Section 3.5**), informal consultation and the first round of Expert Topic Group (ETG) meetings held as part of the Evidence Plan Process (further detailed in **Chapter 1: Introduction**).

Workshop 2: Review of potential design layouts for WTGs and grid which informed the minimum spacing.

risk particularly when considered in combination with the proximity to the Inshore Traffic Zone (ITZ). Particular concerns were raised that vessels utilising the TSS may be forced to travel much further west, in order to access the ITZ, with the attraction of Shoreham port to commercial vessel operators therefore being compromised as a result. There were also concerns raised around the displacement of fishing vessels in Shoreham.

- 3.3.24 Concerns were also raised for the potential for the formation of a narrow channel between the western edge of the array and the MCZ containing the Owers and Mixon rocks (as noted by the Royal Yacht Association). With limited available sea room for safe navigation and collision avoidance, such a narrow channel may result in increased collision and grounding risks. The Scoping Boundary has therefore been refined down here, to allow more space between the array area and the Owers and Mixon rocks.
- 3.3.25 As a result of these concerns the Zone 6 area closest to the TSS (to the east) and fishing grounds near Shoreham, and the Extension area to the west have been reduced for the PEIR Assessment Boundary. These constraints are shown on

Figure 3.1, Volume 3 and the reduction in the boundary is illustrated on Figure 3.3, Volume 3. Shipping and navigation risks are considered in more detail in Chapter 13: Shipping and navigation.

- 3.3.26 For Rampion 1, SLVIA was a principal issue at Examination, due to the location of the array 13km off the Sussex coast and therefore its exposure to and visibility from settlements along the coast, the South Downs National Park (SDNP) and the Sussex Heritage Coast. Through early engagement it became clear that these issues also apply to Rampion 2. The Rampion 1 Examination Recommendation Report (PINS, 2013) made the following points which are also of relevance to the design of Rampion 2, and were taken into consideration during the refinement of the PEIR Assessment boundary:
 - the importance of uninterrupted sea views to the character and sensation of space when within Brighton;
 - material visual impact of Rampion 1 on Brighton and the seafront in particular;
 - on balance, the Examining Authority did not consider the effect on seaward views from coastal settlements to outweigh the need for energy infrastructure; and
 - the Examining Authority panel did not consider the likely effect of night-time lighting to be an over intrusive element of the night skyline in relation to SLVIA.
- 3.3.27 The concerns raised with regard to visual impact have also been addressed by reducing the Zone 6 area in the east, to reduce the impact from the Sussex Heritage Coast. The Round 3 Zone 6 area is shown on **Figure 3.1, Volume 3**, and the reduced area included in the PEIR Assessment Boundary is illustrated on **Figure 3.3, Volume 3**. Layout concepts are explored further in **Chapter 16**: **Seascape, landscape and visual**.
- 3.3.28 Finally, through engagement it was identified that the Scoping Boundary extended beyond the area covered by the digital aerial ornithological surveys (for which it is best practice to collect site-specific survey data covering the proposed array area plus a 4km buffer). Consequently, the boundary at the eastern end of the original Zone 6 area has been refined to ensure that the proposed Rampion 2 array area plus a 4km buffer is entirely within the Area of Search covered by the programme of aerial digital surveys.
- 3.3.29 This offshore design refinement process has resulted in the reduction of the Scoping Boundary to the PEIR Assessment Boundary (Figure 3.3, Volume 3).

3.4 Onshore site selection

Introduction

3.4.1 In order to select a landfall location, an onshore cable corridor, and onshore grid connection location, a number of steps were taken. These identified all the available options for onshore sites, then refined these to create the onshore part of the PEIR Assessment Boundary based on known environmental, technical and commercial constraints. The overall process is shown in **Graphic 3-2** and described in the following sections. Site selection is an iterative process, and the

steps shown in **Graphic 3-2** sometimes occurred in parallel or were revisited as more information became available.





Identification of grid connection location

Step 1: Initial screening of grid connection options

- 3.4.2 In order to begin to define the onshore elements of the Propose Development, it was necessary to understand the various options for connecting the power output into the electrical grid system.
- 3.4.3 Large scale offshore wind farms need to be connected into National Grid's 400kV electricity transmission system, as opposed to the local Distribution system which

is generally designed to feed local homes and businesses and only has capacity to accommodate smaller generators.

- 3.4.4 This was also the case for the existing Rampion 1 Wind Farm which feeds its 400MW output into Bolney National Grid Substation in Mid Sussex.
- 3.4.5 Onshore infrastructure from the existing Rampion 1 project cannot be used or readily modified for use by Rampion 2 since the cables and substation equipment for the existing windfarm already operate at full capacity and were only designed for the original wind farm approved in 2014. Rampion 2 will require additional new infrastructure capable of carrying up to three times the electrical output of Rampion 1.
- 3.4.6 Under the Electricity Act 1989, transmission assets must be divested by generators following construction. Therefore, the Rampion 1 assets are owned by an unrelated company to the Applicant and could not be shared or upgraded in any case.

Step 2: Due regard of the South Downs National Park

- 3.4.7 The importance and sensitivity of the South Downs National Park was a key consideration of this initial screening exercise, since the choice of grid connection location would fundamentally influence if, and to what extent, new onshore infrastructure may cross the National Park.
- 3.4.8 **Graphic 3-3** below shows that the 400kV transmission line runs west to east through Hampshire, Sussex and Kent, with a number of key locations on the system at which generators can connect.



Graphic 3-3 Electricity Transmission System in Southeast England (based on National Grid, 2020)

- 3.4.9 The three most likely candidates in terms of location and distance were considered to be:
 - Bolney, Mid Sussex, where the existing Rampion Offshore Wind Farm connects into the grid;
 - Lovedean, Hampshire, approximately 64.8km west of Bolney; and
 - Ninfield, East Sussex, approximately 51.4km east of Bolney.
- 3.4.10 Ninfield was discounted as being not economically viable when assessed for the original Rampion project. This option and why it had been discounted, was presented in Section 3 Alternatives of the ES for Rampion 1 (E.ON Climate and Renewables, 2012), and summarised in **paragraph 3.4.22**.
- 3.4.11 During the early development process, the possibility arose of a future new connection location in this part of the 400kV transmission system. National Grid are still at an early stage of planning for a new substation known as Little Horsted, to be located between Bolney and Ninfield.
- 3.4.12 As with Bolney and Lovedean, a connection into Little Horsted would involve crossing the South Downs National Park.
- 3.4.13 Due to the sensitivity and importance of the South Downs National Park, it was decided that two further options would be also be considered as part of initial screening. These are Fawley and Chilling, both in Hampshire and located in the order of 80km west of Bolney.
- 3.4.14 Although these options are substantially further away than the three options referred above, they were considered as they would require very minimal onshore infrastructure, and would avoid need for any cabling through the National Park.

Step 3: Grid connection feasibility study

- 3.4.15 An electrical connection feasibility study was conducted by National Grid at RED's request, entitled 'Feasibility Study for the connection of up to 1200MW of Rampion Extension Project' (dated July 2020). The study also established the electrical capacity (megawatts) likely to be available on the transmission system on the desired project timescales, and identified what localised and wider system upgrades would be needed for each of the substations considered.
- 3.4.16 The study concluded that up to 1,200MW would be available on this part of the transmission system for a project coming onstream after 2027. The study also identified the following factors that are relevant to on a connection point:
 - Bolney and Fawley each would be capable of accommodating 1,200MW of generation;
 - Lovedean and Chilling both had capacity limits, of 800MW and 700MW respectively, so either of these options would require a significant scaling back of the proposed output of Rampion 2;
 - there were concerns about available physical space at Lovedean for the necessary new equipment should the planned Aquind Interconnector between England and France gain consent and connect into the substation; and

• Little Horsted was at a very a preliminary stage of development, both in technical, business case and consent terms, it could therefore only be regarded as a speculative future possible substation.

Step 4: Options discounted due to economic non-viability

- 3.4.17 The Fawley and Chilling options, located on the west and east banks of Southampton Water respectively, are significantly further away than the other grid connection options. However, they were included because (subject to technical and economic viability) they would require minimal onshore infrastructure as well as avoiding any elements of the Proposed Development impacting on the South Downs National Park.
- 3.4.18 Having initiated the grid electrical feasibility studies with National Grid, a further evaluation of likely costs and risks associated with these two options was conducted. The following key aspects were identified.
 - Fawley and Chilling would both require four marine export cable circuits being laid over a distance of at least 55km from the most westerly possible extent of the offshore wind farm Area of Search, most likely even further from the actual wind farm proposal ultimately defined within the Area of Search.
 - Laying cable across this length of route, as opposed to the 17km offshore export cable route used for the original Rampion 1 project, brings with it a higher risk level of unforeseen seabed issues and general construction risk.
 - The site preparation for four cable circuits totalling over 240km, spaced sufficient apart would entail significant preparation costs for boulder and unexploded ordnance (UXO) clearance (particularly important in this area due to historic UXO levels in and around Southampton and Portsmouth).
 - Both the Fawley and Chilling options have significant issues with shipping and navigation through the Solent and Southampton Water, which experience very high levels of shipping and other marine traffic. In the case of Fawley, this would require four separate marine cabling installation operations across the full width of the very busy shipping lanes in Southampton Water.
 - The cross-sea route towards Fawley or Chilling also crosses the main shipping route in and out of Portsmouth. All of these factors would significantly constrain the operational logistics of how and when the cable installation work could be undertaken, with such restrictions typically adding significantly to the construction cost.
 - The IFA 2 Interconnector² also connects into the National Grid at Chilling, with a landfall at Monks Hill beach in the Solent.
 - In terms of the local environment, there are number of nature conservation site designations along the coastline of Southampton Water, both marine and land-based. Chilling, although located at the coast, has a challenge of shallow and

² Interconnexion France-Angleterre 2 (IFA 2) is a subsea electrical interconnector running under the English Channel between France and UK

silted inshore approaches which would further complicate and add significant cost to the installation of cabling into this landfall.

- 3.4.19 An assessment of the likely costs to install marine cables was made, taking into account the logistical constraints due to high volume of shipping which would mean an extended timeframe to complete the works.
- 3.4.20 For the Chilling option, the additional capital cost required was estimated to be £129m, compared to the selected Climping to Bolney corridor. This additional cost, together with Chilling being constrained to 700MW, would render the overall Proposed Development not economically viable.
- 3.4.21 For the Fawley option, the additional capital cost compared to the selected Climping to Bolney corridor was estimated to be £216m. Although Fawley could accommodate the full proposed 1,200MW output, as with Chilling this additional cost would be prohibitive and render the overall Proposed Development not economically viable.
- 3.4.22 Ninfield was considered and rejected for the existing Rampion 1 project, and the reasons for discounting it remain applicable (Appendix 3.1, E.ON Climate and Renewables, 2012). An updated estimate, for consistency with the other options presented above made relative to the Climping to Bolney corridor, is £302m.
- 3.4.23 In addition to prohibitive additional costs of a significantly longer marine cable, there were a number of other issues including shipping, steep cliffs and ecological constraints including the Pevensey Levels SSSI.
- 3.4.24 It is recognised that economic drivers should not be the sole factor in deciding which option should be pursued. However, in this case these three options are not economically viable by a very significant margin, which would effectively end the prospects for the development.
- 3.4.25 However, this still left three other options for the grid connection location for the next stage of evaluation: Bolney, Lovedean and Little Horsted, with the latter having the caveat of development uncertainty/timing, which was to be explored further.

Step 5: Screening of landfall and cable route options

Approach to screening

- 3.4.26 Based on the remaining three grid connections, a screening exercise of combinations of landfall and cable corridor options to reach the grid connection points was carried out.
- 3.4.27 A constraints mapping approach was used to assess the environmental, consenting and technical constraints associated with each option. The study area covered the onshore (landward of Mean Low Water Springs) area to the substation options plus 30km. Constraints data was gathered in a GIS format, and presented on maps as layers.
- 3.4.28 Using professional judgement, these were described as 'hard' or 'soft' constraints. 'Hard' constraints are those that will directly influence the boundaries of sites/indicative cable routes, unless suitable mitigation is available. They generally

constitute no-build areas and are often defined through reference to national policy and legislation. Examples of hard constraints are:

- Ramsar sites, Special Protection Areas, and other internationally protected sites for biodiversity;
- historic environment designated sites, such as World Heritage Sites and Conservation Areas;
- settlements;
- some land uses such as quarries and Ministry of Defence land; and
- technical constraints such as gradients over 10%.

3.4.29

Soft' constraints will not generally prevent progress when considered in isolation. Soft constraints are more likely to include local policy designations and can often be moderated through mitigation. Examples include:

- landscape and visual designations such as Areas of Outstanding Natural Beauty (AONB) and public rights of way including National Trails;
- some designated sites for biodiversity such as ancient woodland and National Nature Reserves;
- land uses such as leisure and recreation; and
- technical constraints such as motorways and railway lines.
- 3.4.30 The constraint layers were combined to create an initial 'heat map' (with no individual weighting). This provided an initial indication of the spread and concentration of constraints in the study area, which acted as a visual aid for the assessment. In addition to classifying and analysing the key constraints, a number of 'ideal' technical criteria were established to aid the identification of potential landfall locations, substation search areas and indicative cable routes.
- 3.4.31 Site visits were used to ground-truth the constraints analysis, and a workshop was held to review and sense-check all the available information. The aim of this workshop was to further consider the landfall, cable route and substation locations. Professional judgement was used to establish those considered to be most technically viable and which have the fewest environmental / consenting constraints, and identify pinch-points. The sections below describe the outcomes of this screening exercise.
- A 50m onshore temporary construction corridor is required for the majority of the route, although it may be possible to reduce this width in areas of particular localised constraints. This indicative corridor is shown in Graphic 3-4 to Graphic 3-9.

Landfall locations considered

- ^{3.4.33} In addition to considering the landfall used for the existing Rampion 1 project, at Brooklands Park, East Worthing, five additional landfall options were identified, giving a total of six landfall options which were assessed (see **Table 3-2**).³
- 3.4.34 The Sussex coastline is heavily developed, in particular the central conurbation extending from Worthing in the west, through Lancing, Shoreham, Portslade, Hove and Brighton in the east. To the east of Brighton vertical cliffs rise providing a significant barrier to available landing points until east of Newhaven.
- 3.4.35 This led to all but one of the landfall options falling outside of this central conurbation area. There had been other options within this area that were considered but discounted for the existing Rampion 1 project, which also would not be suitable for this Proposed Development (Section 3.4 Landfall Selection Process, E.ON Climate and Renewables, 2012).
- 3.4.36 The criteria for a suitable landfall includes sufficient physical space onshore, for the onshore cabling, transition joint bays and Horizontal Directional Drilling (HDD) drilling rig and construction logistical operations, and an unconstrained inshore area for when export cable laying vessels will come in close to shore.
- 3.4.37 In addition, as well as sufficient open space at the landfall itself, it is crucial that there is a workable onwards route towards the eventual grid connection point. There were some locations with open space at the coast, such as Goring Gap, which then had a built environment barrier slightly further inland, thereby not providing a feasible onward route towards the grid connection point.
- 3.4.38 A potential landfall location at Lee-on-the-Solent was excluded due to the presence of Ministry of Defence land and close proximity to Alver Country Park. Similarly, a landfall location at West Wittering was excluded as a potential option due to recreational constraints and the presence of Chichester and Langstone Harbours Special Protection Area (SPA).
- 3.4.39 To inform the identification of potential landfall locations, substation sites and indicative cable routes, a detailed constraints mapping exercise was undertaken whereby a number of key environmental, technical and commercial constraints were established. This constraints data was gathered over a study area based on a 30km buffer around the potential grid connection points to allow for the area between these points and the coastline.



³ This excludes Saltdean and Rottingdean which were initially considered, but immediately discounted. The steep cliffs at these locations were of concern, as they reach significant heights and the feasibility of installing cable circuits beneath them was uncertain.

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Grid Connection Option	Landfall(s)	Comment
Bolney	Brooklands	As per existing Rampion 1 project landfall
	Climping	Next nearest landfall option west of Brooklands which met the necessary criteria
Lovedean	Climping	Next nearest landfall option west of Brooklands which met the necessary criteria
	Church Norton	Lying east of the headland of Selsey Bill
	Bracklesham	Lying west of the headland of Selsey Bill
	East Wittering	Most westerly option, lying west of the headland of Selsey Bill
Little Horsted	Tide Mills	Next nearest technically feasible landfall option east of Brooklands which met the necessary criteria
	Saltdean	Initially considered but immediately discounted as not feasible due to steep cliffs.
	Rottingdean	Initially considered but immediately discounted as not feasible due to steep cliffs.

Table 3-2	Description	of landfall to	grid	connection	options	considered
			3			

- 3.4.40 This constraints mapping informed the development of the onshore element of the Scoping Boundary which the Scoping Report (RED, 2020) was based upon. A summary of the design evolution work and reasonable alternatives considered which led to the development of the Scoping Boundary is provided in **paragraphs 3.4.26** to **3.4.32**.
- 3.4.41 Indicative routes were identified which minimised the likely impact on the environment whilst complying with technical feasibility criteria (e.g. construction width requirements, gradients, and bend radius). These indicative routes from the landfall options are shown on **Figure 3.4**, **Volume 3**.

3.4.42 The next sections outline those options which were considered but subsequently discounted in favour of the selected Climping to Bolney landfall.

Screening of Bolney connection landfall and cable corridor options

a) Existing Rampion 1 cable route via Brooklands

- 3.4.43 The first option considered for additional cabling to Bolney was to follow the same general alignment as used on the existing Rampion 1 project, starting from a landfall location at Brooklands Park, East Worthing.
- 3.4.44 There is already a good understanding of the environmental and technical characteristics and constraints along this route from the development and construction of the existing project. In addition, this option would also benefit from existing landowner relations for the majority of the additional land which is likely to be required.
- 3.4.45 Whilst 14km of this route traversed the South Downs National Park, the successful reinstatement of the route and in particular the sensitive section of chalk grassland at Tottington Mount, would give confidence that further cables could be laid and reinstated in an acceptable manner.
- 3.4.46 An assessment was first conducted at the Brooklands landfall, which is key to the feasibility of this route, since it defines the start point and hence also the onward route towards Bolney. As well as the constraints considered when designing the existing project, this assessment needed to consider a revised baseline position including the presence of infrastructure installed for Rampion 1.
- 3.4.47 The scope of assessment included not only the onshore spatial and technical requirements at Brooklands Park, but also the nearshore constraints relevant to the feasibility of the necessary offshore works associated with the bringing export cables into the landfall.
- 3.4.48 The findings of the landfall assessment were as follows.
 - Within Brooklands Park, the existing project infrastructure and other preexisting site constraints leaves insufficient physical space for new project infrastructure of up to double the physical size of the existing project.
 - It would not be possible to locate up to four new Transition Joint Bays (compared to the two of the existing project) or accommodate a 50m cable working width routed northwards through the remainder of the site.
 - There is a particular pinch point towards the north of the Brooklands site, where the Rampion 1 cables crossed Teville stream near Southern Water works. In order to avoid damage to the stream, cables were routed along a narrow, culverted access road, leaving no space available for additional cables.
 - Much of the Brooklands site is a capped off landfill site which required a particular routeing and special precautions when constructing Rampion 1 to avoid any environmental pollution incident. Routeing under or through the lake situated within this area was ruled out as a high environmental risk.

- There is also a highly congested inshore/intertidal area as well as constraints from existing assets and plant onshore in and adjacent to Brooklands Park. This includes four cables from the existing Rampion 1 Offshore Wind Farm (three power cables and one communications cable) as well as operations-critical outfall pipes from Southern Water and GSK water treatment and chemical plants respectively.
- Underground pipes and cables associated with the adjacent works were discovered during Rampion 1 construction through the Park, which were not identified before construction.
- Cables fan out to a broad offshore corridor of around 350m width, for construction purposes, and accessibility for maintenance and repair. There is insufficient flexibility for likely required vessel 'anchor spread' for a cable installation vessel nearshore to safely install four new export cables in the vicinity of the existing live power cables and outfall pipes.
- 3.4.49 In summary, the assessment concluded that the required additional Transition Joint Bays and cable corridor cannot be physically accommodated at the Brooklands landfall, due to existing constraints both onshore and offshore.
- 3.4.50 Aside from these constraints preventing the use of Brooklands as landfall, a number of spatial bottlenecks were also identified further along the existing Rampion 1 route where it was only just feasible to accommodate the existing project infrastructure.
- 3.4.51 The most significant of these was at Tottington Mount, at the northern escarpment, within the South Downs National Park. This was the highest point on the original Rampion 1 cable route, it is visually prominent and has a significant sensitive Chalk Grassland habitat to navigate through.
- 3.4.52 At this location, steep gradients required the Rampion 1 onshore cable to take an 'S-shaped' routeing to meet technical and safe working gradient limits. The route also crossed a Scheduled Monument (cross dyke) at Tottington Mount. Specialist techniques were employed to limit impact (precision trenching) and enhanced reinstatement such as deep cut turves replaced as quickly as possible and supplementation with native seeds (collected in previous seasons and stored at Kew Seed Bank).
- 3.4.53 The findings of the assessment at Tottington Mount were that in order to install cables for Rampion 2 in parallel with the existing route (with typical working width of 50m to accommodate trenches, excavated material and a haul road), they could not be accommodated without horizontal 'benching' into the hillside. This technique is typically used for roads or rail lines which traverse steep hill side slopes. Even with a locally reduced working width, this would result in a significant impact to habitat and the hillside profile, with a wide-reaching visual scar. This was deemed not to be an option given visual and habitat sensitivity.
- 3.4.54 Based on the above assessments, it was concluded it was not technically feasible to follow the existing Rampion 1 cable route and therefore this was not considered to be a reasonable alternative. Therefore, no constraints mapping was undertaken for this option and it was duly discounted.



b) Climping to Bolney

Graphic 3-4 Climping to Bolney



- 3.4.55 The following paragraphs and **Graphic 3-4** summarise the Climping to Bolney onshore cable route corridor. As this is the preferred cable route corridor, and is used as the basis of the PEIR Assessment Boundary, further details on this route are included in **Chapter 4: The Proposed Development.** Further route refinements that have been made to the router since scoping are described in **paragraphs 3.4.103** to **3.4.109**.
- 3.4.56 At 36.6km, the indicative cable route was approximately 10km shorter than all options with grid connection points at Lovedean, and is closer to the offshore wind site. The route passes through five relevant planning authority areas, including the South Downs National Park Authority (SDNPA). However, the length of cable route through the National Park (14km) is approximately half the distance of the options at Lovedean or Little Horsted. Within the SDNP, the route passes through areas assessed as having low to medium levels of tranquillity in the SDNP Tranquillity Study (SDNPA, 2017).

3.4.57 The route crosses some areas of flood zone 3, which may require trenchless construction techniques, avoidance of construction compounds in these areas, and / or a flood risk assessment. Construction works may impact upon blocks of mature woodland, including Priority Habitat.

Screening of Lovedean connection landfall and cable corridor options

Introduction

- 3.4.58 For the Lovedean connection option, four potential landfall locations in West Sussex were identified at:
 - Climping (as ultimately selected for the Proposed Development landfall but connecting at Bolney);
 - Church Norton;
 - Bracklesham; and
 - East Wittering.
- 3.4.59 The conclusion of this exercise was that there was not a feasible route (approaching from the landfalls lying to the south/southeast) which could avoid the SDNP altogether. A route skirting the south of the SDNP boundary is not deemed feasible in routeing logistics terms due to a number of built environment obstacles, specifically the urbanised area to the north of Portsmouth.
- 3.4.60 The following routeings described in the sections below are influenced by avoidance of environmental and physical constraints within the SDNP area. A technical constraint associated with Lovedean is the Aquind Interconnector which if approved would also connect into Lovedean. This introduces spatial and technical constraints for connecting the wind farm into the Lovedean substation.
- 3.4.61 Following the constraints appraisal, it was identified that Lovedean substation has capacity limit of 800MW so would require a significant scaling back of the proposed output of Rampion 2.

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Option A - Climping to Lovedean





- 3.4.62 At 46.7km, this was one of the longer indicative cable routes identified; it passes through seven relevant planning authority areas (see **Graphic 3-5**). The route is partially within the SDNP and passes through an area assessed as having a relatively high level of tranquillity (SDNPA, 2017), and is close to two of the SDNP's representative viewpoints.
- 3.4.63 The route crosses several regional trails, including the West Sussex Literary Trail, Staunton Way, Shipwright's Way, Sussex Border path and Monarch's Way as well as National Cycle Network Routes 2 and 22.
- 3.4.64 This route option crosses a Scheduled Monument (Devil's Ditch), where consultation with Historic England would be required on the nature of the works and the potential need for Scheduled Monument consent.
- 3.4.65 The route crosses some areas of flood zone 3, which may require trenchless construction techniques, avoidance of construction compounds in these areas, and/or a flood risk assessment.

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3.4.66 The Climping to Lovedean option passes through small areas of mature woodland, some of which are Priority Habitat, and is in close proximity to ancient woodland.

Option B – East Wittering to Lovedean

Graphic 3-6 East Wittering to Lovedean



- 3.4.67 At 47.3km, this was one of the longer indicative cable routes identified (see **Graphic 3-6**); it passes through six relevant planning authority areas. The route is partially within the SDNP and passes through an area assessed as having a relatively high level of tranquillity (SDNPA, 2017), between Chilgrove and Chalton. This route option is close to two of the SDNP's representative viewpoints and crosses the north-eastern tip of the Chichester Harbour Area of Outstanding Natural Beauty (AONB).
- 3.4.68 The route crosses several regional trails, including the West Sussex Literary Trail, Staunton Way, Shipwright's Way, Sussex Border path and Monarch's Way as well as National Cycle Network Routes 2 and 22.

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- 3.4.69 This route option crosses a Scheduled Monument (Devil's Ditch), where consultation with Historic England would be required on the nature of the works and the potential need for Scheduled Monument consent.
- 3.4.70 The route crosses notable areas of flood zone 3, which may require trenchless construction techniques, avoidance of construction compounds in these areas, and/or a flood risk assessment.
- 3.4.71 At Fishbourne Channel, the route crosses a number of international, European and national biodiversity designations. For the purposes of the screening process, it is assumed that this crossing will be made by HDD. Whilst Habitat Regulations Assessment (HRA) would be required, it is not expected that there would be adverse effects on the integrity of these sites. Further inland, the route option passes through small areas of mature woodland, some of which are Priority Habitat. The route option also passes in close proximity to ancient woodland.

Option C – Bracklesham to Lovedean




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- 3.4.72 The Bracklesham to Lovedean route is 45.2km in length and passes through six relevant planning authority areas (see **Graphic 3-7**). The route is partially within the SDNP and passes through an area assessed as having a relatively high level of tranquillity (SDNPA, 2017), between Chilgrove and Chalton. This route option is close to two of the SDNP's representative viewpoints and crosses the north-eastern tip of the Chichester Harbour Area of Outstanding Natural Beauty (AONB).
- 3.4.73 The route crosses several regional trails, including the West Sussex Literary Trail, Staunton Way, Shipwright's Way, Sussex Border path and Monarch's Way as well as National Cycle Network Routes 2 and 22.
- 3.4.74 This route option crosses a Scheduled Monument (Devil's Ditch), where consultation with Historic England would be required on the nature of the works and the potential need for Scheduled Monument consent.
- 3.4.75 The route crosses notable areas of flood zone 3, which may require trenchless construction techniques, avoidance of construction compounds in these areas, and/or a flood risk assessment.
- 3.4.76 At Fishbourne Channel, the route crosses a number of international, European and national biodiversity designations. For the purposes of the screening process, it is assumed that this crossing will be made by HDD. Whilst Habitat Regulations Assessment (HRA) would be required, it is not expected that there would be adverse effects on the integrity of these sites. Further inland, the route option passes through small areas of mature woodland, some of which are Priority Habitat. The route option also passes in close proximity to ancient woodland.

wood.

Option D – Church Norton to Lovedean





- 3.4.77 At 47.7km, this is the longest of the indicative cable routes identified; it passes through six relevant planning authority areas (see **Graphic 3-8**). The route is partially within the SDNP and passes through an area assessed as having a relatively high level of tranquillity (SDNPA, 2017), between Chilgrove and Chalton. This route option is close to two of the SDNP's representative viewpoints and crosses the north-eastern tip of the Chichester Harbour Area of Outstanding Natural Beauty (AONB).
- 3.4.78 The route crosses several regional trails, including the West Sussex Literary Trail, Staunton Way, Shipwright's Way, Sussex Border path and Monarch's Way as well as National Cycle Network Routes 2 and 22.
- 3.4.79 This route option crosses a Scheduled Monument (Devil's Ditch), where consultation with Historic England would be required on the nature of the works and the potential need for Scheduled Monument consent.

- 3.4.80 The route crosses notable areas of flood zone 3, which may require trenchless construction techniques, avoidance of construction compounds in these areas, and / or a flood risk assessment.
- 3.4.81 Depending on the location of the HDD for the landfall installation, the indicative cable route will be in close proximity to multiple international and European biodiversity designations present and possibly pass through Priority Habitats Lowland Fens and Reedbed.
- 3.4.82 At Fishbourne Channel, the route crosses a number of international, European and national biodiversity designations. For the purposes of the screening process, it is assumed that this crossing will be made by HDD. Whilst Habitat Regulations Assessment (HRA) would be required, it is not expected that there would be adverse effects on the integrity of these sites. Further inland, the route option may pass through small areas of mature woodland, some of which are Priority Habitat. The route option also passes in close proximity to ancient woodland.

Screening of Little Horsted connection landfall and cable corridor

- 3.4.83 Little Horsted is a potential future substation and is not yet consented. However, it was decided to progress landfall and cable route corridor constraint mapping in parallel with discussions with National Grid to understand the likely prospects for this and the risk it would not go ahead or not on the required timescales.
- 3.4.84 Three locations (Rottingdean, Saltdean and Tide Mills) were identified that were located outside 'hard' constraints. However, there were concerns over the technical feasibility of installing cable circuits beneath the steep cliffs at both Rottingdean and Saltdean. Therefore, Tide Mills was considered to be the only technically feasible option.
- 3.4.85 Eastern and western routes were considered from Tide Mills to Little Horsted, as shown in **Graphic 3-9**. Key constraints identified for these routes include:
 - routes pass though priority habitats, and the eastern option passes through a Local Wildlife Site;
 - western option passes through a Scheduled Monument;
 - half of both routes is in the SDNP;
 - much of the western route is elevated leading to potential visual impacts;
 - construction may impact leisure activities including access to the beach via Mill Drove, Buckle Caravan and Camping Park, and a sailing club;
 - both routes pass through a recreation ground;
 - both routes pass through flood zone 3; and
 - uncertainty whether National Grid will progress the Little Horsted substation site.



Graphic 3-9

Conclusion of Screening Process

A summary of the constraints identified in the screening process is provided in 3.4.86
Table 3-3. As a result of this process, the Climping to Bolney option was chosen
 as the preferred onshore cable corridor and was subsequently taken forward to the Scoping stage.

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Table 3-3 Summary of constraints for landfall to substation options

Landfall / Substation Option	Length of cable route corridor	Environmental issues identified	Technical issues identified	Risk factors	Outcome of screening
Existing Rampion Route via Brooklands	26.2km (including 14.0km through SDNP)	Tottington Mount - visually prominent and has a significant sensitive Chalk Grassland habitat.	Required additional infrastructure cannot be physically accommodated at the Brooklands landfall, due to existing constraints both onshore and offshore.	No specific issues identified.	It was concluded it is not technically feasible to follow the original Rampion 1 route due constraints at the landfall and Tottington Mount. This option is therefore not a reasonable alternative.
Climping to Bolney	36.6km (including 14.0km through SDNP)	Mature woodland, Priority Habitat. South Downs National Park (SDNP) including areas of low to medium tranquillity. Flood zone 3	Limited space for construction and / or potential disturbance at: crossing of the A259 Priory Farm Crossing of A24	No specific issues identified.	Selected as cable route for Scoping.



Landfall / Substation Option	Length of cable route corridor	Environmental issues identified	Technical issues identified	Risk factors	Outcome of screening
			 Fair Oak Farm and Upper Buncton Farm; and Spithandle Lane. 		
Climping to Lovedean	46.7km (including 31.0km through SDNP)	Scheduled monument Flood zone 3 Mature woodland, Priority Habitat, proximity to ancient woodland SDNP including viewpoints and areas of high tranquillity. Regional public rights of way.	Lovedean substation has capacity limit of 800MW so would require a significant scaling back of the proposed output of Rampion 2. ⁴ Limited space for construction and / or potential disturbance at: • agricultural retailers / wholesalers and New Road • woodland of Chilgrove Hill and the B2141, Bow Hill Farm	No specific issues identified.	Rejected due to technical issues (capacity at Lovedean substation) and environmental constraints.

⁴ Constraints mapping is an iterative process, and the technical information on the capacity limit at Lovedean was identified after this was included as a potential substation location.



Landfall / Substation Option	Length of cable route corridor	Environmental issues identified	Technical issues identified	Risk factors	Outcome of screening
			(also potential slopes in this area); and		
			 the crossing of a railway and a minor road due to Old Idsworth Garden and its access road. 		
East Wittering to Lovedean 47.3km (including 28.5km through SDNP)	47.3km (including 28.5km through SDNP)	International, European and national biodiversity designations at Fishbourne Channel.	Lovedean substation has capacity limit of 800MW so would require a significant scaling back of the proposed output of Rampion 2. Limited space for construction and / or potential disturbance at:	No specific issues identified.	Rejected due to technical issues (capacity at Lovedean substation) and environmental constraints.
		Scheduled monument			
		Flood zone 3			
		Mature woodland, Priority Habitat, proximity to			
	ancient woodland	 woodland of 			
		SDNP including viewpoints and areas of high tranquillity.	Chilgrove Hill and the B2141, Bow Hill Farm (also potential slopes in this area); and		
		Regional public rights of way.			
			 the crossing of a railway and a minor 		



Landfall / Substation Option	Length of cable route corridor	Environmental issues identified	Technical issues identified	Risk factors	Outcome of screening
		Chichester Harbour AONB.	road due to Old Idsworth Garden and its access road.		
Bracklesham to Lovedean	45.2km (including 28.5km through SDNP)	As East Wittering to Lovedean	As East Wittering to Lovedean	No specific issues identified.	Rejected due to technical issues (capacity at Lovedean substation) and environmental constraints.
Church Norton to Lovedean	47.7km (including 28.5km through SDNP)	As East Wittering to Lovedean	As East Wittering to Lovedean	No specific issues identified.	Rejected due to technical issues (capacity at Lovedean substation) and environmental constraints.
Tide Mills to Little Horsted	22.4 to 23.3km (including approximately 10km through SDNP)	Western option: loss of a Scheduled Monument, elevation and visibility of construction works.	No specific issues identified.	National Grid's substation at Little Horsted may not be progressed.	Rejected due to uncertainty over Little Horsted substation site.



Landfall / Substation Option	Length of cable route corridor	Environmental issues identified	Technical issues identified	Risk factors	Outcome of screening
		Eastern sub-option: passes through Local Wildlife Site.			
		Both options: flood zone 3, priority habitats, SDNP, leisure activities, recreation ground.			

- 3.4.87 It is planned that the Lovedean substation will be extended by National Grid for the Aquind interconnector project, which would limit the maximum capacity available to Rampion 2 to 800MW. Following the substation extension there will only remain sufficient space for a single bay connection which would have significant limit the space available for Rampion 2. The cable route from the proposed landfall at Climping to Lovedean is 10km longer than from Climping to Bolney in total, and is a longer route across the National Park.
- 3.4.88 Based on this screening process and the onshore site selection appraisal, a landfall at Climping was selected with an identified route connecting it to Bolney, noting that the new substation site may not be directly adjoining the existing Bolney substation site. This substation, landfall and connecting cable route combination was selected largely due to Climping being in closest proximity to the preferred connection point (relative to other options considered) but also for the following key reasons:
 - the limited number of statutory designations at the coast and immediately inland in association with the Climping landfall;
 - the availability of large foreshore areas clear of development and large flat areas immediately inland at the Climping landfall;
 - there are isolated Listed Buildings in the vicinity of Climping landfall, but these can be avoided through the sensitive locating of construction works;
 - the ancient woodland and Priority Habitat woodland in the vicinity of the Climping landfall and the potential substation site options are avoidable;
 - the Climping landfall is well screened for local residential receptors;
 - the landfall is located in close proximity (relative to the other landfall options identified) to Rampion 2 site minimising the offshore cable route required;
 - the limited number of Listed Buildings within 500m of the existing Bolney substation and the potential satellite substation site options are generally well screened / within the bounds of properties;
 - statutory ecological designations are largely avoided along the cable route, and none were identified within the corridor during the screening process; and
 - the identified cable route generally avoids developments including settlements, isolated houses and other buildings. Any impacts on isolated Listed Buildings that may be in the vicinity should be avoidable through detailed design and planning of the cable laying works in those sections. Following the Scoping stage, the cable corridor refinement process considered a 50m buffer around all residential properties (see paragraph 3.4.98).
- 3.4.89 It was noted at the Scoping stage that this connection combination does include developing within the South Downs National Park.
- 3.4.90 A more detailed investigation of the Climping to Bolney cable route and potential substation sites in proximity to the existing Bolney substation was subsequently undertaken to:
 - investigate and appraise potential new substation site options in the vicinity of the existing Bolney connection (which is explored in the next section) using the

same methodology described above and determine potential cable routes to these from the indicative cable route;

- understand land ownership along the cable route and at potential substation site options; and
- consider potential technical pinchpoints including ground truthing along the indicative cable route and understand options to minimise these.

Step 6: National Grid CION process

- 3.4.91 Separate from the Applicant's own screening process to establish the preferred connection point in terms of feasibility, deliverability and environmental impact, National Grid, as transmission system owner, has a separate selection process. This must be performed in order to satisfy regulations set out by Ofgem, the electricity industry regulator.
- 3.4.92 A key part of this is the Connections Infrastructure Option Notice (CION) process, which is typically carried out as a final check on the grid connection solution selected by the developer.
- 3.4.93 The CION process evaluates the transmission options required for a development. It leads to the identification of a connection point which is in line with obligations to develop and maintain an efficient, coordinated and economical system of the electricity transmission network.
- National Grid confirmed in February 2020 that their CION assessment had concluded Bolney would be the most economic and efficient grid connection location which meets the required capacity and Proposed Development timeframe. This would therefore be the basis of the Connection Agreement between National Grid and the Applicant.

Development of the onshore part of the Scoping Boundary

- 3.4.95 The Screening Process described above concluded that the Climping to Bolney onshore cable corridor was to be taken forward to the Scoping stage. This was the basis upon which the Scoping assessment was presented in the Rampion 2 EIA Scoping Report (RED, 2020).
- 3.4.96 The Scoping Boundary was approximately 37km in length, included the landfall area at Climping, a cable route corridor stretching from Climping to Bolney, and an area within which to identify the new substation. The boundary was approximately 2km wide along the cable corridor, including a 1km buffer either side of the indicative potential cable centreline. The Scoping Boundary was approximately 5.7km wide in the area being considered for the substation at the north eastern extent of the cable route corridor as a preferred location had not yet been identified.

Onshore cable corridor refinement since the Scoping stage

Overview

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- 3.4.97 Following the Scoping stage, the onshore cable route was further refined to reduce the number of options being considered and the size of the area included in the PEIR Assessment Boundary. The design refinement process delivering the onshore cable corridor element of the PEIR Assessment Boundary has been informed by several multi-disciplined activities. These have brought together engineering, environmental, land ownership and stakeholder concerns and sensitivities to propose, appraise and reduce alternatives within the Scoping Boundary.
- 3.4.98 When refining the proposed cable corridor location, the following high-level guiding principles were identified:
 - selection of the shortest cable route to minimise environmental effects through Proposed Development footprint between the landfall at Climping and potential substation search areas near Bolney;

Stakeholder engagement:

Consideration of stakeholder feedback from the Scoping Opinion and onshore Expert Topic Groups (ETG) meetings and other engagement held for onshore aspects (see **Chapter 1: Introduction** for a list of ETG meetings and attendees).

Workshops: Collaboration of engineering and environmental specialists to review technical, environmental and land ownership pinch points along the cable route, incorporating a review of concerns previously raised by stakeholders.

EIA surveys: Analysis of information collected from EIA surveys and providing input via collaborative workshops.

Informal consultation: An informal consultation exercise was undertaken between 14 January and 11 February 2021.

- minimise disruption by considering the proximity to properties. Where possible, a 50m buffer has been applied to properties; this buffer will inform the ongoing design evolution and identify locations where additional baseline information or further design amendments may be required (this distance was defined as an area within which there was a significant possibility of construction and/or operation effects to sensitive receptors); and
- avoidance of key sensitive features where possible by the early adoption of commitments outlined in the Commitments Register and set out in Table 3-1 such as C-3, C-4, C-6, C-20, C-23 and C-75; and
- minimise disruption to sensitive features where possible by the early adoption
 of commitments outlined in the Commitments Register and set out in Table 3-1
 such as C-3, C-4, C-5, C-6 and C-20.
- 3.4.99 Onshore cable corridor design refinement workshops interrogated technical, environmental and land ownership pinch points along the potential onshore cable corridor, incorporating a review of stakeholder concerns to propose, appraise and reduce alternatives. A comparative analysis exercise was performed where cable corridor options were identified to facilitate a clear and robust approach to the

selection of a preferred option or reduce the number of options being considered. This approach also facilitated incorporation of National Planning Policy Framework (NPPF) and National Planning Statement (NPS) mitigation requirements discussed in **paragraph 3.1.4** as well as balancing technical engineering constraints.

- 3.4.100 The onshore design refinement workshops described above adopted a BRAG (Black, Red, Amber, Green) appraisal approach to define constraints for each option using the colour coding and rating system shown in **Table 3-4**. The constraints included:
 - biodiversity;
 - historic environment;
 - agricultural land;
 - landscape and visual;
 - planning policy and planning applications;
 - residential properties and other sensitive land uses;
 - flood risk and surface water; and
 - technical concerns.

Table 3-4 BRAG appraisal approach for design refinement

1	Low potential for the development to be constrained (green) e.g. option is not located close to sensitivities such as historical assets, priority habitats or settlements and does not directly interact with these constraints.
2	Medium potential for the development to be constrained (amber) e.g. option is located within close proximity to sensitivities such as priority habitat, listed buildings, flood zones or properties, but does not directly interact with these constraints.
3	High potential for the development to be constrained (red) e.g. option directly disturbs sensitivities such as a Local Wildlife Site; flood zone 2; engineering constraints such as side slopes present construction challenges.
4	Very high potential for the development to be constrained (black) e.g. option directly interacts with sensitivities such as flood zone 3, internationally designated sites or construction is unfeasible due to engineering challenges such as steep slopes.

3.4.101 The onshore cable corridor element of the Scoping Boundary has been refined through the activities described, considering alternatives where appropriate to avoid or minimise environmental sensitivities. The exercise undertaken took the indicative cable route from the initial onshore appraisal study that connected Climping to Bolney within the Scoping Boundary as a starting point. Localised cable route options were compared against this original route, and a summary of

the key options considered are presented in **paragraphs 3.4.103** to **3.4.132** and shown on **Figure 3.5**, **Volume 3**.

3.4.102 The PEIR Assessment Boundary (**Figure 1.1, Volume 3**) incorporates the cable route options still under consideration which are assessed with the onshore aspect chapters (**Chapters 18** to **28**). These are at Warningcamp, and at the two substation options at Wineham Lane North and Bolney Road/Kent Street.

Climping

- 3.4.103 Through a review of the environmental sensitivities at the landfall location at Climping, it is proposed for the landfall to be sited to the west of the Climping Beach SSSI and for it to be installed using HDD techniques (outlined in C–4, **Table 3-1**) which will avoid any disruption to the intertidal zone at Climping and to Littlehampton Golf Course and Atherington Beach Local Wildlife Site (LWS). The use of HDD techniques will result in the onshore cable being set back from the beach in adjacent agricultural fields. Further details on the choice of HDD at the landfall location is provided in **paragraph 3.5.13**.
- 3.4.104 Alternative cable routeing options (**Graphic 3-10**) were considered at Climping as the initial appraisal study route (Climping A) in this location was within close proximity to properties, Climping Park (a residential retirement park) and listed buildings. The original route also included a bend which would present technical construction challenges. Furthermore, it was deemed necessary to straighten the crossing angle of the River Arun and railway, to facilitate HDD techniques in this location. Alternatives considered (Climping B and C) sought to reduce interaction with sensitivities and optimise cable route length and shape. All three route options run through the flood plain (flood zone 3).

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Graphic 3-10 Cable route options considered at Climping

- 3.4.105 The initial appraisal study route (Climping A) bends around Climping Park (within approximately 100m) and avoids part of the flood plain and therefore presents a longer cable route of approximately 4km in length. Two HDDs would be required to cross the A259 and the River Arun separately. It is located within 100m of a number of listed buildings, within approximately 90m of a residential property on A259, and is within 300m of an area outlined in Arun's Adopted Local Plan as allocated for housing.
- 3.4.106 The Climping B route option was proposed as an alternative to avoid close proximity to a number of listed buildings, to provide more space for a crossing of the A259 by HDD and to provide a more direct cable route of approximately 3.78km in length that minimises bends. However, Climping B overlaps with land allocated for housing in Arun's Local Plan, is within 100m of two listed buildings (which are residential properties) associated with Brookpits Manor, and is approximately 50m from Climping Park.

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- 3.4.107 The Climping C route was proposed as an alternative route as it allows a crossing of two roads and a watercourse with a single HDD and is approximately 3.82km in length. It is furthest away from Climping Park (located between Climping A and B) at approximately 200m distance, and is further away from some listed buildings compared to the other routes (approximately 220m from the cable route centreline). However, the Climping C route also overlaps with land allocated for housing in Arun's Local Plan.
- 3.4.108 Climping A and Climping B routes in this location have been discounted owing to close proximity to housing developments, Climping Park and listed buildings, and due to technical engineering challenges. The Climping C route option was adopted as part of the PEIR Assessment Boundary. As this route overlaps with land allocated for housing, and is close to residential properties in the north of the area, these issues are assessed in the PEIR and will continue to be considered during the route refinement. The likely significant effects associated with the adopted route are set out in the relevant onshore assessment chapters (Chapters 18 to 28) such as Chapter 27: Water environment.
- 3.4.109 Following informal consultation feedback received in early 2021, it was identified that the area of the PEIR Assessment Boundary potentially allocated for a construction compound at Climping overlaps with an area that has received planning consent. The planning approval is for up to 300 houses, shops, offices, open space and transport improvements (Arun District Council, undated). As a result, the potential location of the compound was reviewed and was subsequently moved to a new location in Climping so that the PEIR Assessment Boundary now avoids the planned residential development.

Warningcamp

- 3.4.110 The initial appraisal study route at Warningcamp is shown as Warningcamp A on **Graphic 3-11.** The following constraints were identified for this route option:
 - located within 60m of the Bathworth Park Lyminster Scheduled Monument (SM) (ringworks);
 - located within 40m of Arun Valley LWS;
 - located within 30m of ancient woodland;
 - passes through 70m of flood zone 2;
 - crosses the A27 road via HDD and the route is in close proximity to the A27 bypass project located to the west;
 - potential landscape and visual impacts due to the proximity to Arundel Castle; and
 - transverses a side slope which presents engineering construction challenges.
- 3.4.111 Due to these constraints, three potential alternative routes were identified in this location, and the initial appraisal study route (Warningcamp A) was not considered further in the PEIR.

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Graphic 3-11 Cable route options considered at Warningcamp

- 3.4.112 Warningcamp D route option crosses through approximately 740m of Arun Valley LWS which is considered an important area for breeding birds, dragonflies, water beetles, snails and plants. It also crosses through approximately 890m of flood zone 2 and 70m of flood zone 3. It is located approximately 100m from ancient woodland and 60m from Batworth Park Lyminster SM. As with the initial appraisal study route (Warningcamp A), this would require a crossing of the A27 via HDD and the route would also need to pass the planned A27 bypass project promoted by Highways England, located to the west. It is approximately 100m from the Grade II* listed Priory Farmhouse and crosses an archaeological notification area (Site of Pynham Augustinian Priory and Hospital, and Calcetto Priory Medieval Farmstead, Arundel). Given the significant environmental sensitivities associated with this cable route option in comparison to the other potential cable route options, the Warningcamp D option was discounted from further consideration in the PEIR.
- 3.4.113 The remaining two cable route options have been retained within the PEIR Assessment Boundary at this stage and are named as Warningcamp B and C.

Overall, there is no clear preference for either Warningcamp B or C at this stage of design. The following environmental constraints have been identified:

- Warningcamp B crosses an archaeological notification area (Napoleonic Barracks and possible burial ground, Crossbush) and there may be lasting impacts below ground due to the cable crossing this archaeological site;
- Warningcamp C is more constrained by ancient woodland;
- Warningcamp C is likely to cause more construction traffic impacts to the village of Crossbush; and
- both Warningcamp B and C are within a sensitive area for noise due to the close proximity of residential receptors.
- 3.4.114 In order to select the final cable route in this area, further information will be gathered via a site visit to review the technical constraints, site access and proximity to nearby residential receptors. An archaeological geophysical survey is also planned and to target priority areas including Warningcamp B route. Relevant onshore assessment chapters where likely significant effects of each of the options are set out include Chapter 23: Terrestrial ecology and nature conservation, Chapter 26: Historic environment and Chapter 27: Water environment.

Wepham and Norfolk Clump

- 3.4.115 At Wepham the initial appraisal study route option (Norfolk Clump C shown in **Graphic 3-12**) crossed side slopes presenting technical construction challenges, including a requirement for benching which would cause additional impacts (see **paragraph 3.4.53**). The alternative routes Norfolk Clump A and B were therefore identified as a reasonable alternative to avoid these challenges by reconfiguring the cable route to 90 degrees over the slope.
- 3.4.116 Norfolk Clump C route crosses approximately 300m of Warningcamp Hill and New Down LWS and is located approximately 50m from ancient woodland. It also crosses approximately 1.85km of Source Protection Zone 2. This route option crosses approximately 550m of an archaeological notification area (Deserted Medieval Village on Warningcamp Hill) and through approximately 3.3km of another archaeological notification area (Multi-Period Archaeological Features on Wepham Down, Barpham Hill and Perry Hill, Burpham).
- 3.4.117 In comparison, Norfolk Clump A and B cross less of Source Protection Zone 2 and of the LWS (approximately 230m in total). These routes are located in close proximity to three areas of ancient woodland, the closest being within approximately 60m. As with Norfolk Clump C, these alternatives cross approximately 550m of an archaeological notification area and through approximately 3.1km of another archaeological notification area (Multi-Period Archaeological Features on Wepham Down, Barpham Hill and Perry Hill, Burpham). Given the technical construction challenges presented by the initial appraisal study (Norfolk Clump C) route option, it was discounted and Norfolk Clump A and B were considered in more detail.

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Graphic 3-12 Cable route options considered at Norfolk Clump

- 3.4.118 The following environmental constraints were identified for the two remaining options which pass to the northwest (Norfolk Clump A) and southeast (Norfolk Clump B) of Norfolk Clump, both to the northeast of Wepham:
 - Norfolk Clump A crosses approximately 1.6km of Source Protection Zone 2, which may present consenting issues, compared to approximately 370m for Norfolk Clump B. Although Norfolk Clump B is less sensitive, it is on a slope which could be challenging in terms of surface water.
 - Norfolk Clump A is sited on the brow of a hill; commitment C-67 (Table 3-1) states "The onshore cable route will avoid the brows of hills as far as is reasonably practical". It also runs directly adjacent to a PRoW although there is a hedge separating the potential cable corridor and the PRoW.
 - Norfolk Clump A would therefore require more PRoW management than Norfolk Clump B. However, a PRoW crossing would be necessary for Norfolk Clump B south of Home Farm.

- Although Norfolk Clump B is closer to the Warningcamp Hill and New Down LWS (within approximately 260m, compared to 600m for Norfolk Clump A), the cable corridor further south at Wepham runs through this LWS.
- There are fewer utilities crossings on Norfolk Clump B.
- Overall Norfolk Clump B was preferred from an environmental perspective and has 3.4.119 been adopted as the PEIR Assessment Boundary. Norfolk Clump A was discounted and is not considered further in the PEIR. Relevant onshore assessment chapters where likely significant effects of the adopted route in this area are set out include Chapter 23: Terrestrial ecology and nature conservation, Chapter 26: Historic environment and Chapter 27: Water environment.

Washington

- Following a site visit and review of topography maps, a number of constraints were 3.4.120 identified in this area, including crossing a steep slope and ancient woodland. The initial appraisal study route (Washington A shown on **Graphic 3-13**) is within 40m of Washington Chalk Pit, which is a Locally Important Geological Site and a historic landfill site. The route crosses through approximately 2.3km of an Archaeological Notification Area (Prehistoric Features on Barnsfarm Hill and Highden Hill, Storrington and Sullington and Washington) and approximately 870m of another Archaeological Notification Area (Multi-Period Features on Chantry Bottom, Sullington Hill and Kithurst Hill, Storrington and Sullington). The route is in close proximity to the South Downs Way and runs through an area designated under Horsham's Neighbourhood Plan for potential future development.
- An alternative route option (Washington B) was identified to reduce technical 3 4 121 difficulties associated with the slope and potential environmental impacts. The area to the south and east is highly constrained with steep slopes and environmental sensitivities such as Chanctonbury Hill SSSI and Washington Chalk Quarry LWS, as well as ancient woodland. As a result, there are no viable options further to the east of Washington A, and the areas directly north and west of Washington A are constrained by steep slopes, Sullington Hill LWS and patches of ancient woodland.





Graphic 3-13 Cable route options considered at Washington

The Washington B route was considered to be the only viable alternative to the 3.4.122 initial Washington A route, with the least impact on environmental sensitivities as they avoid crossing ancient woodland. This route is located marginally outside the Scoping Boundary (which is discussed further in Chapter 5: Approach to EIA) and crosses approximately 200m of Sullington Hill LWS. The route is located approximately 40m from Rock Common Sand Quarry, a locally important geological site and crosses through approximately 1km of Archaeological Notification Area: Multi-Period Features on Chantry Bottom, Sullington Hill and Kithurst Hill, Storrington and Sullington. It is within 100m of Washington Conservation Area, which includes several Grade II listed buildings and within 100m of two Grade II listed buildings at Lower Chancton Farm. Views in this area will also need to be considered from the SDNP. The refinement of the Washington B route and the specific construction techniques in this area are being discussed with key stakeholders including the South Downs National Park Authority to better understand sensitivities and preferences for cable construction in this area.

- 3.4.123 Given the technical construction challenges presented by the initial appraisal study route (Washington A), it was discounted and the Washington B route was adopted as part of the PEIR Assessment Boundary. The likely significant effects associated with the adopted route are set out in the relevant onshore assessment chapters such as Chapter 23: Terrestrial ecology and nature conservation and Chapter 19: Landscape and visual impact.
- 3.4.124 In informal consultation received in early 2021, West Sussex County Council identified a preference for a trenchless crossing of Sullington Hill LWS, to reduce ecology impacts. Sullington Hill LWS is located along the adopted route to the south west of Washington (see **Graphic 3-14**), and is designated for chalk grassland and woodland. HDD techniques have therefore been adopted at this location and will be included in the PEIR assessment.

Windmill Quarry

3.4.125 At Washington, West Sussex the initial appraisal study route (Windmill Quarry C, shown on **Graphic 3-14**) crosses through Windmill Quarry, an authorised and active landfill site shown in brown. This rendered this cable route unviable and has therefore been discounted from any further consideration in this PEIR. Two reasonable alternative routes were therefore proposed for consideration, one of which has been included within the PEIR Assessment Boundary (Windmill Quarry B route option with extension).



- 3.4.126 The two alternative two route options (Windmill Quarry A and B) avoid Windmill Quarry landfill and pockets of ancient woodland, however they do cross through a larger area of the SDNP compared to the original Windmill Quarry C route. A gas pipeline has also been identified which crosses the A283 and would cross these routes. Therefore, an extension to Windmill Quarry B has also been proposed to minimise engineering issues associated with the existing gas pipeline. The following environmental issues have been identified with these options and the extension:
 - both routes are in proximity to ancient woodland, although there is more room on Windmill Quarry B for ecological considerations and involves one less hedgerow crossing;
 - Windmill Quarry B and extension avoids more woodland and trees;
 - the potential impacts from noise due to the proximity to residential properties in the area will need to be considered;

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- Windmill Quarry A has the potential for more impacts to the historic environment; and
- access to Windmill Quarry A is through a single-track road which would need to remain open for residents as it is their only access. In contrast, the dualcarriage way access for Windmill Quarry B would be easier to cross and manage.
- 3.4.127 Overall, from an environment and engineering perspective, Windmill Quarry B with the extension to avoid the gas pipeline is preferred and has been adopted as the PEIR Assessment Boundary. Windmill Quarry A has been discounted and is not considered further in the PEIR. Relevant onshore assessment chapters where likely significant effects of the adopted route are set out include Chapter 23: Terrestrial ecology and nature conservation and Chapter 19: Landscape and visual impact.

Henfield

3.4.128 The initial appraisal study route through the Henfield area was presented as two options, Henfield 1A and Henfield 1B (shown on **Graphic 3-15**). Both routes cross the River Adur and its tributaries at numerous points, most of which are classed as main watercourses. RED are committed to using HDD techniques to cross all main watercourses (see C-5 in **Table 3-1**). Therefore, the Henfield 1A route would require six separate HDDs and Henfield 1B route would require four separate HDDs. Both Henfield 1A and 1B routes also cross flood zones 2 and 3 at numerous points.





- 3.4.129 Henfield 1C route has been proposed as an alternative route to reduce the number of watercourse crossings and area of flood zone crossed. This route crosses the River Adur in a single location and crosses less flood zones than Henfield 1A and 1B route option, and only two HDDs would be required. All routes are within proximity to ancient woodland.
- 3.4.130 Given the significant water environment constraints and associated engineering challenges presented by Henfield 1A and 1B routes, both routes were discounted and Henfield 1C was adopted as part of the PEIR Assessment Boundary. The likely significant effects associated with the adopted route are set out in the relevant onshore assessment chapters such as **Chapter 23: Terrestrial ecology and nature conservation** and **Chapter 27: Water environment**.

Bolney Road/Kent Street

3.4.131 The original route (Bolney Road 1A&1B) crossed approximately 90m of flood zone 2 and is located within approximately 40m of flood zone 3 (shown on Graphic 3-16). It runs parallel to Cowfold Stream. Two alternative routes have been proposed to avoid crossing this section of the flood plain and to provide a more direct cable

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route which are Bolney Road 1E (central route), and Bolney Road 1C & 1D (western route).



Graphic 3-16 Cable route options considered at Bolney Road/Kent Street

- 3.4.132 Bolney Road 1E route was discounted due to its very close proximity to a property (Lower Barn) and the requirement to cross the floodplain twice. The environmental constraints associated with the two remaining options are:
 - Bolney Road 1A&1B crosses the floodplain in two locations, and runs parallel to Cowfold Stream, a tributary of the River Adur. At the floodplain crossings, it also crosses broad bands of vegetation (approximately 20m wide) with mature trees;
 - Bolney Road 1A&1B would cause more disturbance to landowner than route 1C & 1D which goes through the middle of this area rather than following the stream;
 - Bolney Road 1A&1B is longer than 1C&1D by approximately is 500m; and

- Bolney Road 1C & 1D is a more direct cable re-route which avoids the flood plain entirely.
- 3.4.133 Overall, from an environmental and engineering point of view, Route 1C&1D is preferred and have been adopted as the PEIR Assessment Boundary. Route 1A&1B has been discounted and is not considered further in this PEIR. Relevant onshore assessment chapters where likely significant effects of the adopted route are set out include **Chapter 27: Water environment**.

Onshore substation search area refinement since Scoping

Initial substation search areas

- 3.4.134 Since the Scoping stage, more detailed site selection work has been undertaken to appraise the seven substation search area options within the Scoping Boundary. The following high-level guiding principles guided the initial identification of suitable sites:
 - to be located within the Scoping Boundary and within 5km of the grid connection point at Bolney (see paragraph 3.4.135);
 - avoid key sensitive features where possible by the early adoption of commitments outlined in the Commitments Register and set out in Table 3-1 such as C-3, C-4, C-6, C-20, C-23 and C-75;
 - minimise disruption to sensitive features where possible by the early adoption
 of commitments outlined in the Commitments Register and set out in Table 3-1
 such as C-3, C-4, C-5, C-6 and C-20;
 - avoid residential properties, and considered proximity to residential properties and other sensitive land uses as far as possible; and
 - to have access from a suitable public highway.
- 3.4.135 In order to meet National Grid Code reactive power requirements, dynamic compensation electrical equipment should be installed ideally as close to the grid connection point as possible. As the distance from this equipment to the connection point increases, the size of the required compensation equipment also increases. This can have implications on National Grid's speed of response requirements. For these reasons a workable distance of 5km was determined from which to base the onshore substation search areas.
- 3.4.136 Onshore substation search area refinement workshops interrogated technical, environmental and land ownership issues at each of the sites, incorporating a review of stakeholder concerns to appraise and reduce the number of options. Following further design work, it was identified that an area of approximately 9ha is required to site the substation, including areas for temporary construction, permanent infrastructure and embedded environmental measures. Therefore, three of these substation search areas were discounted (see **Figure 3.6, Volume 3**, and **paragraphs 3.4.137** to **3.4.139**).
- 3.4.137 Eight Acres Shaw substation search area was discounted due to the following issues:

- the site is within an area being promoted within the Draft Local Plan for Horsham for development of a new town (Mayfield); and
- at 4.9ha, the site area was considered too small to accommodate the permanent substation area and construction laydown area.
- 3.4.138 Frylands substation search area was discounted due to the following issues:
 - at 3.3ha, the site area was considered too small to accommodate the permanent substation area and construction laydown area;
 - the site cannot be expanded in size due to existing properties to the north, west and south and overhead 400kV lines to the east; and
 - Frylands Farm immediately to the south, has direct close-range views across the site.
- 3.4.139 Snake Harbour substation search area was discounted due to the following issues:
 - at 4.1ha, the site area was considered too small for the permanent substation area and construction laydown area;
 - the site cannot be expanded in size due to the close proximity of existing properties; and
 - the site has open views from Snake Harbour House to the immediate west and Snake Harbour Farm to the north.

Star Road substation search area

- 3.4.140 A comparative analysis exercise was performed on the four remaining substation search area options to facilitate a clear and robust approach to reducing the number of options being considered at PEIR. This exercise was informed by:
 - a review of environmental constraints mapping and any information provided by EIA surveys undertaken;
 - stakeholder consultation with relevant Local Planning Authorities (LPAs), the SDNPA and Natural England to understand potential concerns and risks;
 - a review of land ownership and ongoing engagement with landowners; and
 - a technical site survey to confirm suitability.
- 3.4.141 As a result of this exercise one further substation search area (Star Road) was discounted from any further consideration in the PEIR. This is adjacent to an industrial estate in the village of Partridge Green (**Figure 3.6, Volume 3** and **Graphic 3-17**. The following constraints were identified associated with this substation search area:
 - the substation search area is located in a floodplain with the southern part of the area situated within Flood Zone 3;
 - of the four remaining substation search areas, Star Road is located the furthest away from the routes potentially required for construction traffic;
 - several public rights of way cross the substation search area which would potentially need to be permanently re-routed;

- existing sewage works in the vicinity of the substation search area could lead to the potential for existing ground contamination; and
- the substation search area encroaches on grazing marsh, and is adjacent to ancient woodland, both of which are priority habitats.
- 3.4.142 On balance this substation search area option had the most environmental constraints when compared with the other substation search areas. When considering the configuration of permanent and temporary work areas within the remaining developable area of the substation search area, it was considered to be too small and also has bordering environmental sensitivities. Therefore, Star Road has been discounted from further consideration in the PEIR.

Graphic 3-17 Star Road substation search area option



Wineham Lane South substation search area

- 3.4.143 Wineham Lane South substation search area is located immediately south of Bob Lane, to the south of the existing Bolney substation (**Figure 3.6, Volume 3** and **Graphic 3-18**) on greenfield land. Access would be from Wineham Lane. Constraints associated with this substation search area option include its close proximity to ancient woodland which borders the east of the area, and its proximity to a Grade II listed building.
- 3.4.144 Desk study data does not suggest a concentration of records of protected species in this substation search area and cable route options leading to this substation search area option require fewer watercourse crossings than Wineham Lane North and Bolney Road/Kent Street search area options.
- 3.4.145 This option is less than 50m from the Royal Oak pub and residential properties on Wineham Lane, so there is potential for socio-economic impacts and disturbance to residents. Local residents have provided feedback that they would prefer this option to be removed. Information was also received that planning applications for commercial developments cover part of this site.



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3.4.146 As a result of informal consultation feedback and the proximity to sensitive receptors, Wineham Lane South substation search area has been removed from the PEIR Assessment Boundary.

Graphic 3-18 Wineham Lane South substation search area option



3.4.147 A summary of the key characteristics of the two remaining search area options are presented in **paragraphs 3.4.148** to **3.4.156** and all substation search area options are illustrated on **Figure 3.6**, **Volume 3**. A number of cable routes were considered to each of these areas, see **paragraphs 3.4.158** to **3.4.179**.

Bolney Road/Kent Street substation search area

- 3.4.148 Bolney Road/Kent Street substation search area option is located to the east of Cowfold Village (Figure 3.6, Volume 3 and Graphic 3-19) on greenfield land adjacent to an industrial estate. Constraints associated with this search area option include its proximity to Oakendene Manor Grade II listed building, proximity to the High Weald Area of Outstanding Natural Beauty (AONB) and nearby residential properties. It is also the furthest substation option from the grid connection point at Bolney.
- 3.4.149 No designated sites or priority habitats have been identified within or directly adjacent to this substation search area, and desk study data collected does not suggest a concentration of records of protected species in this substation search area. There is some natural screening around this site due to vegetation.
- 3.4.150 Access to the site would be directly from the A272, which is subject to agreement by Highways England.

3.4.151 Bolney Road/Kent Street substation search area has been retained within the PEIR Assessment Boundary at this stage. Relevant onshore assessment chapters where likely significant effects of each of this option are set out include Chapter 19: Landscape and visual impact, Chapter 22: Noise and vibration and Chapter 26: Historic environment.

Graphic 3-19 Bolney Road/ Kent Street substation search area option



Wineham Lane North substation search area

- 3.4.152 Wineham Lane North substation search area is located immediately to the north of the existing Bolney substation (**Figure 3.6, Volume 3** and **Graphic 3-20**) on greenfield land. Access would be from Wineham Lane. Constraints associated with this search area option include its close proximity to ancient woodland which borders the north of the area, and proximity to nearby properties.
- 3.4.153 Desk study data does not suggest a concentration of records of protected species in this area and there are no historic environment records identified on or adjacent to the substation search area. The substation search area is bordered by some natural mature screening.
- 3.4.154 The cable corridor to this substation option crosses an area that has planning consent to develop a solar farm. An amendment to the cable corridor will need to be considered to avoid this area. A footpath runs through this site, although there is potential to reroute this.
- 3.4.155 Wineham Lane North substation search area has been retained within the PEIR Assessment Boundary at this stage. Relevant onshore assessment chapters where likely significant effects of this option are set out include **Chapter 22: Noise** and vibration and **Chapter 23: Terrestrial ecology and nature conservation**.



Graphic 3-20 Wineham Lane North substation search area

Next steps

- 3.4.156 Both Bolney Road/Kent Street and Wineham Lane North substation search areas have been retained within the PEIR Assessment Boundary. Further information will be gathered in advance of the DCO Application to inform the selection of the final substation location.
- 3.4.157 This will include:
 - consultation with Highways England to understand whether access can be obtained from the A272 to Bolney Road/Kent Street;
 - ongoing ecology surveys that will provide further detailed information on the ecological sensitivities associated with both search area locations;
 - further site visits to both search area locations are planned to further examine the proximity to sensitive receptors, and engineering issues such as construction and operational site access;
 - the EIA work undertaken which will continue to be built on for the ES and will continue to inform the design iteratively. In particular this will include any noise monitoring undertaken;
 - technical and economic analysis; and
 - feedback from informal and formal consultation.

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Cable route options to Wineham Lane North and Bolney Road / Kent Street substation search areas

Introduction

3.4.158 A number of different cable route options were identified to each of the remaining two substation search areas. This section describes those alternative routes considered.

Cable route options to Wineham Lane North substation search area

Overview

3.4.159 **Graphic 3-21** shows the cable route options considered to connect to a substation search area at Wineham Lane North. The potential cable routes identified were also relevant to connect to the since discounted Wineham Lane South substation search area given the close proximity to this site.



Graphic 3-21 Wineham Lane North and Wineham Lane South cable route options

Route shared by Wineham Lane North 1A and Wineham Lane North 1B

- 3.4.160 For this section of the route options (west of Wineham Lane North substation), the following constraints have been identified:
 - existing power line goes through the woodland gap next to this location. This
 route would involve removing some of the existing woodland next to the power
 line, which is relatively new plantation;
 - 200m from Archaeological Notification Area (Site of the Medieval Hospital of St Edmund and St Mary, Shermanbury); and
 - 200m from Snakes Harbour and 430m from Royal Oak Inn, both Grade II listed buildings.
- 3.4.161 This option has been retained within the PEIR Assessment Boundary and these issues continue to be considered.

Route shared by Wineham Lane North 1B and Wineham Lane South 1B

- 3.4.162 For this section of the route options (west of Wineham) the following constraints have been identified:
 - within 100m of flood zone 2 and 3; and
 - close proximity to listed buildings and residential areas at Springlands Gate, Springlands (Grade II listed), Frylands Farm (Grade II listed) and less than 50m from Granary Cottage.
- 3.4.163 Informal consultation responses indicated that Fryland's Lane which is parallel to Wineham Lane North 1B & Wineham Lane South Route 1B is single track, and if the cable route crosses the lane this may temporarily disrupt access to a residential property.
- 3.4.164 This route is less constrained than the alternative at this location (Wineham Lane North Route 1A & Wineham Lane South Route 1A) with fewer trees, it is parallel to the existing 400kV line, and has a less challenging watercourse crossing.
- 3.4.165 This option has been retained within the PEIR Assessment Boundary and these issues continue to be considered.

Route shared by Wineham Lane South 1A and Wineham Lane South 1B

- 3.4.166 For this section of the routes (south of Wineham Lane North substation search area), the following constraints have been identified:
 - located within 220m of ancient woodland;
 - located within 160m of an Archaeological Notification Area (Site of the Medieval Hospital of St Edmund and St Mary, Shermanbury); and
 - located 130m from Grade II listed building: Snakes Harbour, and 260m from Grade II listed building: the Royal Oak Inn.
- 3.4.167 This option has been retained within the PEIR Assessment Boundary and these issues continue to be considered.

Route shared by Wineham Lane North 1A and Wineham Lane South 1A

- 3.4.168 For this section of the route options (to the east of Oaklands Farm and to the west of Springlands) the following constraints have been identified:
 - from a hydrology perspective, this route is preferred due to less flood risk and smaller crossings. The alternative here (Wineham Lane North 1B & Wineham Lane South Route 1B) would require a larger crossing and at greater risk of surface water flood risk;
 - from a historic environment perspective, this route is preferred to the alternative in this area (Wineham Lane North 1B & Wineham Lane South Route 1B) as it has better screening from listed buildings at Granary Cottage; and
 - this route option crosses a non-designated woodland block.
- 3.4.169 The UK Power Networks overhead wires in the northern corner of Wineham Lane North Route 1A & Wineham Lane South Route 1A would potentially require the reduction in the width of the onshore temporary construction corridor. This is also recommended by the ecology team due to the proximity to woodland. This pinch point requires further investigation.
- 3.4.170 This option is included in the PEIR Assessment Boundary and these issues continue to be considered.

Routes to Bolney Lane/Kent Street substation search area

- 3.4.171 **Graphic 3-22** shows the cable route options considered to connect to Bolney Lane/Kent Street search area. For the southern route into the substation (Bolney Rd/Kent St 1A &1C) the following issues have been identified:
 - 530m from an existing industrial estate on the west side of the proposed substation location;
 - located 570m from ancient woodland;
 - on a hill, so potential for more impacts to views;
 - directly adjacent to planning application for Solar photovoltaic Farm; and
 - approximately 200m from residential properties at Westridge Farm and Oakfield Farm.
- 3.4.172 For the northern route (Bolney Rd/ Kent St 1B &1D) the following issues have been identified:
 - 530m from an existing industrial estate on the west side of the proposed substation location;
 - located 240m from ancient woodland;
 - directly adjacent to planning application for solar photovoltaic farm;
 - additional watercourse crossings/surface water flood risk compared to Route 1A &1C; and

- approximately 200m from residential properties at Southfields Farm and Oakfield Farm.
- 3.4.173 Both options would take the same route into the northern side of Bolney substation. The following constraints have been identified for this route:
 - situated next to Rampion 1 substation and therefore needs to avoid crossing RWE's existing cables;
 - the cable corridor is approximately 35m from ancient woodland at Prior's Bush and approximately 100m from ancient woodland at Nyeshill Farm Shaw;
 - 200m from Grade II listed building: Dawe's Farmhouse;
 - overlaps with a planning application for a 10MW solar photovoltaic farm; and
 - overlaps with a change of use planning application: Proposed change of use from existing barn/storage building to a two bedroomed residential dwelling at Dawes Farm.
- 3.4.174 This option has been retained within the PEIR Assessment Boundary and these issues continue to be considered.
- 3.4.175 Both routes are approximately 60m north of Prior's Bush ancient woodland, and within 150m of Eastridge Manor Care Home. Informal consultation feedback has requested that this route is moved further from the ancient woodland and Care Home, and also residential properties within 400m including Coombe House and Dawes Farm. These issues will be considered in the assessment and future design refinements, however the area is generally quite constrained by ancient woodland, residential properties and the planned solar farm. The route that has been selected in this area is the shortest route whilst avoiding environmental sensitivities as far as possible, and no further changes to the route will be made for the PEIR Assessment Boundary.
- 3.4.176 There is no overall preference from an environmental, engineering or other perspective for one of these routes, so both are retained within the PEIR Assessment Boundary.
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Graphic 3-22 Bolney Lane/Kent Street cable route options

Next steps

- 3.4.177 All cable route options to the Wineham Lane North substation search area have been retained within the PEIR Assessment Boundary at this stage as there is no clear preference from an environmental or engineering perspective. Should Wineham Lane North substation search area be discounted from the final design, at least one of these two corridors could be removed.
- 3.4.178 In order to further inform the design refinement process prior to the DCO Application for these cable route options, the following additional information will be obtained:
 - a site visit will be conducted and examine any potential engineering issues;
 - further environmental baseline information such as the results of ongoing ecology surveys will inform a close review of the comparative analysis of each of the routes;
 - technical and economic analysis; and

- feedback from informal and formal consultation with stakeholders.
- 3.4.179 Both route options to the Bolney Road/Kent Street substation search areas have been retained within the PEIR Assessment Boundary, as there is no overall preferred option. If this location is discounted, the southern Bolney Road/Kent Street cable corridor option (Bolney Road/Kent Street Route 1A & 1C) is unlikely to be retained. This would be re-evaluated once a decision on the substation location has been made.

3.5 Alternative technologies

Offshore

WTG foundations

- 3.5.1 The following alternative offshore foundation types were initially considered for the Rampion 2 WTG foundations, in addition to monopiles and jacket foundations:
 - gravity base;
 - tripod foundations; and
 - mono suction bucket foundations.

Brief explanations are provided below as to why these were not taken further in the development of Rampion 2 and hence are not assessed for EIA purposes.

- 3.5.2 Gravity Base foundations are ballasted concrete foundations that sit on the seabed. The stability of these foundations is provided by the overall size and dead weight of the foundation, which is required to resist all the anticipated WTG loads and Met Ocean forces. As a consequence, the foundations tend to be very large and expensive to manufacture onshore, transport to the offshore site and install on a pre-prepared seabed. Gravity foundations also occupy a large footprint on the seabed, so the environmental impact on the seabed and obstruction in the water column is much greater than other types of foundation.
- 3.5.3 Gravity foundations were considered for Rampion 1 at the EIA stage, but were subsequently ruled out due the ground conditions being very variable and unsuitable for this type of foundation. Similar variable ground conditions are known to exist on Rampion 2. Due to the ground conditions and the environmental issues they have not been considered further for Rampion 2.
- 3.5.4 Tripod foundations are steel or concrete three-legged substructures which are secured to the seabed by pin piles. These structures often require complex welding or jointing to manufacture. Offshore wind experience to date has shown that these types of foundations are expensive to fabricate compared to the much simpler three or four legged Jacket foundations. Hence tripod foundations have not been considered further for Rampion 2.
- 3.5.5 A mono suction bucket foundation is a large single open-bottom steel caisson (upturned bucket), which is attached to a tubular column that supports the WTG. During installation the caisson is drawn into the seabed by creating a negative pressure in the void between the caisson and the seabed. Many demonstration

projects have been undertaken to-date in the offshore wind industry. Most have encountered difficulties during installation. Hence the technology is not considered mature enough and carries too much risk for it to be considered as a suitable foundation solution for Rampion 2.

- 3.5.6 Despite the issues with mono-suction bucket foundations, smaller suction buckets have been successfully deployed at the base of Jacket foundations, in lieu of pin piles. Therefore, the option for Jacket foundations with suction bucket has been retained for assessment and further consideration for Rampion 2.
- 3.5.7 Due to these constraints with gravity base, tripod and mono suction bucket foundations, only monopile and jacket foundations have been considered for Rampion 2. These options are described in **Chapter 4**.

Export Cables

- 3.5.8 The following types of export cable were initially considered:
 - High Voltage Direct Current (HVDC); and
 - High Voltage Alternating Current (HVAC), both 275kV and 400kV.
- 3.5.9 Brief explanations are provided below as to why HVDC and 400kV HVAC were not taken further in the development of Rampion 2 and hence are not assessed for EIA purposes.
- 3.5.10 A HVDC connection was discounted on the following basis:
 - The 1.2GW capacity for Rampion 2 is split between two separate offshore array areas (Extension Area and the Zone 6 Area) with a significant distance between the two areas. A single point HVDC connection between the landfall and an offshore substation situated in the Extension Area would result in long array cable lengths being required between the Zone 6 area WTGs and the substation, which would have a significant impact on costs.
 - HVDC is generally considered for export cable circuit lengths of greater than 100km which is approximately where the economic balance point is between HVDC and HVAC. The Rampion 2 export circuit length is significantly less than this threshold point.
- 3.5.11 HVAC was therefore chosen as the most economical means of connecting Rampion 2. A maximum of 275kV is considered, however this voltage may be reduced depending on the final configuration of the wind farm.
- 3.5.12 The alternative solution between a HVDC and a 275kV AC connection is 400kV AC. The circuit length is an issue for 400kV as the cable capacitance at this voltage power limits the ability to export power and leads to significant voltage rise. These factors in turn lead to the requirement for additional electrical equipment (both onshore and offshore) at significant additional cost.

Alternative landfall techniques

3.5.13 Cable landfalls can be accomplished through different methods depending on technical, environmental, social and economic considerations at a landfall site. The landfall construction methods for cable installation are typically:

- open cut;
- HDD; or
- a combination of both.
- 3.5.14 Under the open cut method, a trench is excavated on the beach, similar to the onshore cable route, the cables are installed and the trench is backfilled. The trench can be divided into two sections; the onshore section, which can be undertaken by land-based equipment and the offshore section which has to be undertaken by offshore specialist dredging/trenching equipment.
- 3.5.15 Open cut methodology can be disruptive from an environment and social perspective. Constraints to using open cut are listed below:
 - close proximity to third party buildings;
 - environmentally sensitive ground that cannot be disturbed;
 - multiple obstructions that need to be crossed (roads, railways, canals, ditches) which cannot be disrupted during construction;
 - flood defences that cannot be disturbed; and
 - public access to be the beach, as this will be restricted during installation.
- 3.5.16 Horizontal directional drilling (HDD) is a method of installing cables, in areas that cannot be open cut due to technical, environmental or social considerations. The HDD technique involves drilling a hole through the ground between two points and installing a duct through which the cable will be installed, one of which is offshore for the construction of the landfall.
- 3.5.17 Due to the sensitive nature of the beach and natural flood defences, HDD has been selected for construction of the landfall. This will provide the best solution from an environmental perspective and also has the benefit of the beach remaining open to the general public during the construction activities.

Onshore

Alternative trenchless crossing techniques

- 3.5.18 RED has committed to use trenchless crossings for main watercourses, railways and roads that form part of the Strategic Highways Network. There are several trenchless techniques that can be employed for these types of crossings. These non-open cut crossing methods include auger boring, HDD, pipe-jacking, and microtunnelling. In general, trenchless crossings are constructed at a minimum depth of 2m below roads, 5m below railways and 10m under major rivers. However, the actual design will be submitted to the appropriate body for approval prior to construction.
- 3.5.19 The auger bore crossing technique may be used for non-major highway crossings, ditch crossings, minor river and canal crossings, up to 100m in length. Ground conditions dictate where this technique can be best utilised. The technique is implemented in two forms, guided and non-guided. The preference would be using a guided auger bore in order to maintain accuracy over the crossing alignment.

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- 3.5.20 The HDD crossing technique is generally used for long crossings such as rivers and multiple crossings where trenching or open excavation is not feasible, practical or the environmental and/or social impact is too high. The HDD crossing technique provides a good degree of accuracy.
- 3.5.21 Pipe-jacking uses a hydraulic ram or jack to thrust an open-ended pipe under the crossing. The soil is removed as the pipe is thrust forward. Closed face, unmanned operations are the preferred methods; manned excavations are avoided as far as possible.
- 3.5.22 Commonly the microtunnel crossing technique is used to cross infrastructure such as railway lines, major rivers and motorways. This technique performs well in a variety of ground conditions and gives the best guarantee of little or no settlement. This method requires additional temporary land take for launch and reception pits, drilling fluid management and to accommodate associated equipment.
- 3.5.23 The selection of the crossing methodology for installing a cable duct across natural or built infrastructure such as watercourses, roads and railways has considered various key technical, commercial, schedule and environmental aspects. These include:
 - restrictions such as the ability of the installation contractor to avoid disturbing the surface of the natural obstacle or built infrastructure;
 - disruption and disturbance due to road closures and noise;
 - loss of or disturbance to environmentally sensitive areas such as protected or sensitive habitats, community facilities such as sports grounds, designated sites, and buried archaeology;
 - schedule constraints;
 - economics of crossing methodology;
 - owner's requirements of the natural and built infrastructure; and
 - local government restrictions.
- 3.5.24 Taking these aspects into consideration, where an open cut methodology is not feasible or practical, HDD is the recommended trenchless crossing method for the Proposed Development, subject to the specific requirements of the crossing/infrastructure owner. This is due to the HDD methodology providing the longest available crossing length and a lower cost compared to the alternatives for longer crossings.

3.6 **PINS Scoping Opinion responses**

3.6.1 **Table 3-5** sets out the comments received in Section Four and Five of the PINS Scoping Opinion relevant to the consideration of alternatives and how these have been addressed in this PEIR. A full list of the PINS Scoping Opinion comments and responses is provided in **Appendix 5.1**. Regard has also been given to other stakeholder comments that were received in relation to the Scoping Report (RED, 2020). The information provided in the PEIR is preliminary and therefore not all the

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Scoping Opinion comments have been able to be addressed at this stage, however all comments will be addressed within the ES.

Table 3-5 PINS Scoping Opinion responses relevant to the consideration of alternatives

PINS ID number	Scoping Opinion comment	How this is addressed in this PEIR
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 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	Chapter 4: The Proposed Development describes the technology proposed and states that the 33kV or 66kV option will be chosen based on the WTG model selected. Section 3.5 describes the selection process between HVAC and HVDC
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).	Chapter 4 describes the construction of the landfall and techniques to be adopted. This PEIR chapter (Chapter 3: Alternatives) 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.
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 course crossings, major roadways and railways. The ES should identify the locations and	The PEIR identifies the locations and type of all crossings. Where reliance is placed in the PEIR on the use of a specific method as mitigation, the PEIR and subsequently the ES will ensure that such commitments are appropriately defined and

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PINS ID number	Scoping Opinion comment	How this is addressed in this PEIR
	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.	secured. Appendix 4.2: Crossings schedule, Volume 4 has been produced and cross referenced in the PEIR where appropriate.
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'.	This PEIR chapter 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.	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 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.	This PEIR chapter provides a description of the reasonable alternatives considered by RED.
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	This PEIR chapter and Chapter 4 provide narrative on the narrowing of the range

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PINS ID number	Scoping Opinion comment	How this is addressed in this PEIR
	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 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.	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.
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.	Consideration has been given to the siting of onshore infrastructure in relation to best and most versatile agricultural land (Grade 1, 2 and 3a) in the design process. The assessment of potential temporary and permanent loss of Agricultural Land Classification land is assessed in Chapter 21: Soils and agriculture.
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.	The rail network will be crossed by HDD technique (outlined in commitment C-5 Table 3-1) ensuring no disruption to services. Further information is provided in Chapter 24: Transport .
5.9.2	The Scoping Report does not clearly identify the locations where the cable may	A crossing schedule is provided in Appendix 4.2 :



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PINS ID number	Scoping Opinion comment	How this is addressed in this PEIR
	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.	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. Further information and assessment is provided in Chapter 27: Water environment.
4.9.5	The Inspectorate notes the Applicant's identification of a "significant marine aggregate dredging route…within the north-west of the study area" in this regard.	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 Section 3.3: Offshore site selection).
4.7.5	Paragraph 5.8.5 and figures 5.8.3 – 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.	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 (see Section 3.3).

3.6.2 RED carried out an Informal Consultation exercise for a period of four weeks from 14 January 2021 to 11 February 2021. This Informal Consultation exercise aimed to engage with a range of stakeholders including the prescribed and nonprescribed consultation bodies, local authorities, Parish Councils and general public with a view to introducing the Proposed Development and seeking early feedback on the emerging designs.



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- 3.6.3 The key themes emerging from Informal Consultation in January 2021 relating to alternatives are:
 - concerns over the location of the Wineham Lane substation search area
 options and their proximity to nearby properties in relation to noise in particular;
 - concerns over the use of Wineham Lane for construction traffic;
 - questions around the management of Public Rights of Way during construction including temporary and permanent diversions, and reinstatement;
 - concerns over minimising impacts on sensitive sites including ancient hedgerows, ancient woodland, trees, SSSIs and areas of high biodiversity; and
 - substation design and potential screening.

3.7 Next steps

- 3.7.1 The Rampion 2 design evolution process is an iterative process which has been guided by detailed specialist engineering and environmental assessment, multidisciplinary workshops and informal consultation involving local stakeholders, regulatory stakeholders and non-governmental organisations through Parish Council meetings, Project Liaison Group discussions and the Evidence Plan Process. The process is not yet completed, however, the progress made to date which has informed the design is presented in this PEIR in **Chapter 4**.
- 3.7.2 Design evolution will continue within the PEIR Assessment Boundary following the publication of the PEIR and will be refined further, prior to DCO submission. The final design will take into account full consideration of additional data obtained through further site-specific surveys, desk-based reviews and feedback from both formal and informal consultation.

3.8 **Glossary of terms and abbreviations**

Table 3-	6 Glos	sarv of	terms	and	abbrev	viation	S
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Term (acronym)	Definition
Agricultural Land Classification (ALC)	Agricultural Land Classification provides a means of assessing the quality of farmland. Its assessment is based on physical limitations of the land, such as climate, site characteristics (e.g. gradient) and soil. The assessment gives an indication of the versatility and expected yield of the land. The system classifies agricultural land in five grades. The 'best and most versatile' agricultural land is classified as 1, 2 and 3a. The Agricultural Land Classification was developed by the former Ministry of Agriculture, Fisheries and Food in 1988 and revised in 1996.

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Term (acronym)	Definition
Area of Outstanding Natural Beauty (AONB)	Land protected for conservation and preservation under section 82 of the Countryside and Rights of Way Act 2000 for its natural beauty.
Code of Construction Practice (COCP)	The code sets out the standards and procedures to which developers and contractors must adhere to when undertaking construction of major projects. This will assist with managing the environmental impacts and will identify the main responsibilities and requirements of developers and contractors in constructing their projects.
Development Consent Order	This is the means of obtaining permission for developments categorised as Nationally Significant Infrastructure Projects, under the Planning Act 2008.
Development Consent Order (DCO) Application	An application for consent to undertake a Nationally Significant Infrastructure Project made to the Planning Inspectorate who will consider the application and make a recommendation to the Secretary of State, who will decide on whether development consent should be granted for the Proposed Development.
DML	Deemed Marine Licence
EIA Regulations, 2017	The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017.
	The EIA regulations require that the effects of a project, where these are likely to have a significant effect on the environment, are taken into account in the decision- making process for the project.
Environmental Impact Assessment (EIA)	The process of evaluating the likely significant environmental effects of a proposed project or development over and above the existing circumstances (or 'baseline').
Environmental Statement (ES)	The written output presenting the full findings of the Environmental Impact Assessment.
Evidence Plan Process	A voluntary consultation process with specialist stakeholders to agree the approach and the information required to support the EIA and HRA for certain aspects.
ETG	Expert Topic Group
Habitats Regulation Assessment (HRA)	The assessment of the impacts of implementing a plan or policy on a European Site, the purpose being to consider the impacts of a project against conservation objectives of



Term (acronym)	Definition
	the site and to ascertain whether it would adversely affect the integrity of the site.
Horizontal Directional Drill (HDD)	An engineering technique avoiding open trenches.
Iterative design	A process by which the design is reviewed and amended to make improvements, solve problems, respond to and incorporate environmental measures and feedback from stakeholders.
ITZ	Inshore Traffic Zone
LAT	Lowest Astronomical Tide
LPA	Local Planning Authority
Local Wildlife Site (LWS)	Local Wildlife Sites are non-statutory designations conferred by local planning authorities and given weight through local planning policy. These sites are selected through a selection of criteria (criteria are area dependent) aimed at identifying "substantive nature conservation value".
Marine Conservation Zone (MCZ)	A Marine Conservation Zone (MCZ) is a type of marine nature reserve in UK waters. They were established under the Marine and Coastal Access Act (2009) and are areas designated with the aim to protect nationally important, rare or threatened habitats and species.
National Planning Policy Framework (NPPF)	The National Planning Policy Framework sets out the Government's planning policies for England and how these are expected to be applied. It provides a framework within which local plans can be developed which reflect the community's needs.
NPS	National Policy Statement
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, draw preliminary conclusions

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Term (acronym)	Definition
	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 .
Public Rights of Way	Public Rights of Way include footpaths, byways and bridleways.
Receptor	These are as defined in Regulation 5(2) of The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 and include population and human health, biodiversity, land, soil, water, air, climate, material assets, cultural heritage and landscape that may be at risk from exposure to pollutants which could potentially arise as a result of the Proposed Development.
RED	Rampion Extension Development Limited
Rochdale Envelope	The Rochdale Envelope is a parameter-based approach to environmental assessment which aims to take account of the need for flexibility in the evolution of detailed design.
Scoping Opinion	A Scoping Opinion is adopted by the Secretary of State for a Proposed Development.
Scoping Report	A report that presents the findings of an initial stage in the Environmental Impact Assessment process.
SDNP	South Downs National Park
SDNPA	South Downs National Park Authority
SEA	Strategic Environmental Assessment
Secretary of State	The body who makes the decision to grant development consent.
Site of Importance for Nature Conservation	A designation used by local authorities for area of land of local conservation value.
SM	Scheduled Monument
Site of Special Scientific Interest (SSSI)	Sites designated at the national level under the Wildlife & Countryside Act 1981 (as amended). They are a series of sites that are designated to protect the best examples of significant natural habitats and populations of species.

Term (acronym)	Definition
Special Protection Area (SPA)	Sites designated under EU Directive (79/409/EEC) to protect habitats of migratory birds and certain threatened birds under the Birds Directive
Stakeholder	Person or organisation with a specific interest (commercial, professional or personal) in a particular issue.
TCE	The Crown Estate
TSS	Traffic Separation Scheme

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