Rampion 2 Wind Farm

Category 8: Examination Documents

Applicant's Post Hearing Submission – Issue Specific Hearing 1

Appendix 6 – Further information for Action Point 7 – Horizontal Directional Drilling at Climping Beach

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Revision A

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1. Introduction

1.1 Overview

1.1.1 Rampion Extension Development Limited (hereafter referred to as 'RED') (the 'Applicant') is developing the Rampion 2 Offshore Wind Farm Project ('Rampion 2') located adjacent to the existing Rampion Offshore Wind Farm Project ('Rampion 1') in the English Channel.

1.1.2 Rampion 2 will be located between 13km and 26km from the Sussex Coast in the English Channel and the offshore array area will occupy an area of approximately 160km^2. A detailed description of the Proposed Development is set out in **Chapter 4: The Proposed Development, Volume 2** of the Environmental Statement (ES) **[APP-045]**, submitted with the Development Consent Order (DCO) Application.

1.2 Purpose of this Document

1.2.1 This document provides further information requested in response to Action Point 7 which states "*Applicant to provide more detail on Horizontal Directional Drilling (HDD) including depths of cables at the landfall, under Climping Beach*."

1.3 Response to Action Point 7

1.3.1 This response is to be read in conjunction with the records of Issue Specific Hearing 1 (ISH1) separately contained in 5(iii) of the Applicant's post hearing submission - Issue specific hearing 1 (Document Reference 8.31) regarding: 'The effects of coastal erosion on the Horizontal Directional Drilling under Climping Beach''. The sequence of the landfall construction is detailed in Section 4.4 of the **Chapter 4: The Proposed Development, Volume 2** of the Environmental Statement (ES) **[APP-045]**.

1.3.2 The development of the landfall engineering design takes a variety of factors into consideration, especially as it transitions from the onshore through the intertidal area (Works No 6, as presented in the **Onshore Works Plans** **[PEPD-005]** and described in the **Draft Development Consent Order** **[PEPD-009]**) to the offshore environment. Cable landfall via horizontal directional drilling (HDD) has become an established technique in the industry, however each landfall has its individual environmental setting that is assessed and provided for in the engineering design process.

1.3.3 In general, it is planned that at the landfall at Climping Beach the electrical export cables will transition from offshore to onshore via underground conduits constructed by horizontal directional drilling (HDD). The drilling process starts from the area of the transition joint bay (TJB) on the onshore side (comprising Works No 8 as described in the **Draft Development Consent Order** **[PEPD-009]** and shown on sheet 1 of the **Onshore Works Plans** **[PEPD-005]**), passes underneath the shallower nearshore areas, the beach and the coastal hinterland (comprising Works No. 6 and 7). The alignment depth below the beach profile is not

determined at this point, however it is the Applicant's expectation that the alignment will be constructed to a target depth of at least 5-10 m. The drill profile then returns to the seabed surface in an exit pit on the offshore side below the mean low water spring tide (MLWS) mark, comprising Works No 5 as described in the **Draft Development Consent Order [PEPD-009]** and shown on the **Offshore Works Plans [PEPD-004]**. The purpose of the HDD exit pits on the offshore side is so that the cable can transition directly from the underground conduit into a buried trench moving further offshore. Duct extensions may be used to facilitate the cable installation from a vessel situated further offshore within Works No 5 as shown on the **Offshore Works Plans [PEPD-004]**. HDD exit pits are subsequently backfilled. The Applicant notes at that at present the depth of the HDD is not confirmed as this will depend on further data to be gathered post consent as set out below.

1.3.4 At the Rampion 2 landfall, the Climping beach frontage consists of mixed sand and shingle sediment with a sloped sandy foreshore, backed by managed farmland in the central and western side, and by a sand dune system on its eastern side, a part of which belongs to the designated Climping Beach SSSI site. A failed seawall and groynes are also present to the west. Alongshore net sediment transport is to the east, driven by the predominantly south-westerly wave climate.

1.3.5 The likely future patterns of coastal retreat due to natural processes in the present 'Do Minimum' shoreline management plan scenario was assessed by an expert morphological panel assembled by the Environment Agency and reported in 2020 (Environment Agency, 2020a and 2020b). A largely consistent set of estimates were provided by the individuals on the panel for the position of the future coastline in approximately 50 years, i.e. towards the end of the operational lifetime of Proposed Development. The coastline at and around the landfall, including Climping Beach SSSI is expected to retreat to some extent, but also noting that the natural properties of the coastline would lead to rollback to new positions of natural dynamic stability. In particular, the dunes which form part of the SSSI, are expected to remain 'largely unaffected' by natural beach evolution. There was no suggestion that a major change in coastline processes (affecting any fundamental assumptions or the basis of these estimates) is expected in the next 50 years.

1.3.6 The current outline design of HDD options (including the location of transition jointing bays, the anticipated alignment profile (depth) and the offshore HDD exit pits) is based on the Applicants existing knowledge of the environmental setting, including realistically likely scenarios of coastline erosion, which presently includes:

- Topographic and bathymetric data;
- Indicative information about the shallow geology and surficial soils and sediments at the landfall;
- Conceptual understanding of key processes and historical patterns of change of this coastline from the Shoreline Management Plan (South East Coastal Group, 2006);
- Estimates of the likely rate and pattern of future coastal evolution and retreat based on the results of an expert panel convened by the Environment Agency (Environment Agency, 2020a and 2020b); and

- The present Shoreline Management Plan (South East Coastal Group, 2006) of 'Do Minimum', in conjunction with the presently poor state of remaining coastal defences.
- The Applicant's experience and expertise in the design and execution (and also technical limitations) of HDD, which is a common activity both for offshore wind cable landfall, and generally for the construction of underground conduits for NSIPs and other projects.

1.3.7 It is important to note that at this point the Applicant has not undertaken ground investigation work however, has committed to doing so in commitment C-247 in the **Commitments Register** **[APP-254]** (provided at Deadline 1 submission) and secured within the **Draft Development Consent Order** **[PEPD-009]** Requirement 26. Due to the significant cost and effort associated with the ground investigation onshore and offshore, this is usual practice for projects at the consenting stage. Detailed ground investigation will form the basis for further assessments including the production of detailed ground models and a 'Coastal Erosion and Future Beach Profile Estimation Assessment', which will identify the need for further mitigation or management measures submitted prior to the commencement of Works No 6 or 7. These work steps are required to inform a final HDD design, the profile of which will have sufficient depth to account for forecast coastal change and erosion at Climping Beach.

1.3.8 In addition to considering coastal erosion, the following further factors will determine the final design of the Rampion 2 landfall HDD and as a result also the depth below surface along the crossing alignment:

Geology and Ground Conditions

1.3.9 Building on presently available geological and geotechnical data from nearby wells and surveys, further ground investigation work is necessary. A detailed ground model will be generated to define the area's geological units that will be crossed by the HDD, both landwards and seawards of Lowest Astronomical Tide (LAT). The HDD design for the landfall will consider material properties across different geological units along the entire alignment. Geological conditions will therefore also factor in the determination of the HDD design's optimal alignment and depth.

Anthropogenic Features

1.3.10 Anthropogenic features will be considered and their potential impact on the trajectory and final solution assessed. This will include review of potential for contaminated land (historical site use), unexploded ordnance (UXO), existing infrastructure (such as utilities, or other historic infrastructure, etc.). Features will be reviewed for both the onshore and offshore areas.

Drill Length & Cable Pulling

1.3.11 Drill lengths shall be defined by the final design profiles as an outcome of the geological Model, the intended drill depth, the targeted exit pit location (metres below LAT) and aligned with the requirements of the Coastal Erosion and Future Beach Profile Assessment. Transportation and installation vessel access shall be

considered during the design and overall installation methodology. "Pull-in" checks will also be conducted on the export cable, to ensure it can be installed within acceptable design limits (i.e., not being overstressed).

Flood Risk Assessment

1.3.12 Final positioning of the proposed onshore infrastructure (e.g., the transition joint bays) will consider the outputs from the Flood Risk Assessment (FRA) for the site. This will be reviewed in conjunction with the topographical data to ensure suitable positioning of equipment for the operation and maintenance period beyond construction. Aspects of flood risks and management strategies considered as part of this application relevant to the landfall location are outlined in **Appendix 26.2: Flood Risk Assessment, Volume 2** of the ES **[APP-216]**.

Cable Spacing & Thermal Ratings

1.3.13 Cable spacing for the landfall shall be assessed to confirm that cable ratings (thermal properties) remain within optimal ranges, based on the proposed drill profiles and depths. This shall take account of any thermal resistivity results achieved from detailed ground investigation campaign and be sized to match the project's final electrical design and overall generation capacity.

Conclusion

1.3.14 Whilst it is not possible at this point to definitively outline a minimum depth of the alignment below the current surface level of the beach profile, it is the Applicant's expectation that the HDD conduit will be constructed to a target depth of at least 5-10 m below the current beach profile. The Applicant confirms that the landfall HDD will be designed to maintain sufficient depth of cable burial for the lifetime of the asset, accounting for the presently predicted magnitude of coastal change and erosion.

1.4 References

Environment Agency (2020a). *Expert Geomorphological Panel - Coastal evolution scenarios between Poole Place and the River Arun*. Panel Report - 5 March 2020. (Online) Available at: https://climpingbeach.com/wp-content/uploads/2023/06/4_EA_GeomorphExpertPanelReport_05.03.2020.pdf (Accessed: February 2024).

Environment Agency (2020b). *Coastal evolution scenarios between Poole Place and the River Arun: The Geomorphological Panel report – one year on*. Peterborough; Environment Agency.

South East Coastal Group, (2006). *Beachy Head to Selsey Bill Shoreline Management Plan 2.* (Online) Available at: https://www.southdowns.gov.uk/wp-content/uploads/2018/04/TLL-19-Beachy-Head-to-Selsey-Shoreline-Management-Plan-2006.pdf (Accessed: February 2024).