Rampion 2 Wind Farm

Category 6: Environmental Statement

Volume 2, Chapter 26: Water environment (clean)

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A	04/08/2023	Final for DCO Application	WSP	RED	RED
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Executive Summary

This section summarises the assessment findings at this point in the Environmental Impact Assessment (EIA) process for water environment, based on **Chapter 26: Water environment, Volume 2** of the ES (Document Reference: 6.2.26).

This chapter of the Rampion 2 Environmental Statement (ES) examines the potentially significant effects that may be experienced as a result of Rampion 2 on the water environment.

The Proposed Development which comprises of a landfall, cable corridor and onshore substation intersects parts of the River Arun and upper River Adur and their associated tributaries. A range of receptors have been identified including Water Framework Directive (WFD) water bodies, conservation sites, water resources, and flood risk receptors.

A desk study and site walkovers have been undertaken to establish a baseline which identifies and describes these receptors. This chapter summarises key findings and draws upon detailed information which is presented in the supporting appendices (**Appendix 26.1: Detailed water environment baseline information to Appendix 26.4: Hydrogeological Risk Assessment, Volume 4** of the ES (Document References: 6.4.26.1 to 6.4.26.4)).

The cable route crosses the geological transition between the Lambeth Group and Worthing Chalk in the South Downs which supports a range of public and private water supply abstractions. A detailed Hydrogeological Risk Assessment has been carried out in **Appendix 26.4 Hydrogeological Risk Assessment, Volume 4** of the ES (Document Reference: 6.4.26.4) with a particular emphasis on Southern Water public water supplies in the region.

The water environment assessment in this chapter considers potential effects upon receptors for each phase of the Rampion 2 lifespan including construction, operation and maintenance and decommissioning phases.

A range of design and good industry practices have been incorporated into embedded environmental measures to remove or minimise any environmental effects on water environment receptors as far as possible. The chapter concludes that there will be no significant residual effects from Rampion 2 upon the water environment following the successful implementation of the measures. The chapter also concludes that there will be no significant cumulative, inter-related or transboundary effects.

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26. Water environment

26.1 Introduction

26.1.1 This chapter of the Environmental Statement (ES) presents the results of the assessment of the likely significant effects of Rampion 2 with respect to onshore elements of the water environment (landwards of Mean High Water Springs (MHWS)), which comprises aquatic environment, water resources and flood risk receptors. It should be read in conjunction with the project description provided in **Chapter 4: The Proposed Development, Volume 2** of the ES (Document Reference: 6.2.4) and the relevant parts of the following chapters and appendices:

- **Chapter 6: Coastal processes, Volume 2** of the ES (Document Reference: 6.2.6) in relation to offshore coastal processes receptors including coastal morphology;
- **Chapter 8: Fish and shellfish ecology, Volume 2** of the ES (Document Reference: 6.2.8) and **Chapter 9: Benthic, subtidal and intertidal ecology, Volume 2** of the ES (Document Reference: 6.2.9) in relation to offshore conservation sites and marine water quality considerations;
- **Chapter 17: Socio-economics, Volume 2** of the ES (Document Reference: 6.2.17) in relation to the socio-economic considerations pertaining to the recreational use of the Rivers Arun and Adur and bathing waters;
- **Chapter 22: Terrestrial ecology and nature conservation, Volume 2** of the ES (Document Reference: 6.2.22) in relation to water dependent ecological features; and
- **Chapter 24: Ground conditions, Volume 2** of the ES (Document Reference: 6.2.24) in relation to the mobilisation of potential contaminants present on site.

26.1.2 This chapter describes the following:

- the legislation, planning policy and other documentation that has informed the assessment (**Section 26.2: Relevant legislation, planning policy, and other documentation**);
- the outcome of consultation and engagement that has been undertaken to date, including how matters relating to water environment within the Statutory Consultation have been addressed (**Section 26.3: Consultation and engagement**);
- the scope of the assessment for water environment (**Section 26.4: Scope of the assessment**);
- the methods used for the baseline data gathering (**Section 26.5: Methodology for baseline data gathering**);
- the overall baseline (**Section 26.6: Baseline conditions**);
- embedded environmental measures relevant to water environment and the relevant maximum design scenario (**Section 26.7: Basis for ES assessment**);

- the assessment methods used for the ES (**Section 26.8: Methodology for ES assessment**);
- the assessment of water environment effects (**Section 26.9 - 26.11: Assessment of effects** and **Section 26.12: Assessment of cumulative effects**);
- consideration of transboundary effects (**Section 26.13: Transboundary effects**);
- inter-related effects (**Section 26.14: Inter-related effects**);
- a glossary of terms and abbreviations (**Section 26.15: Glossary of terms and abbreviations**); and
- a references list (**Section 26.16: References**).

26.1.3 The chapter is also supported by the following appendices which will be referred to by their technical appendix numbers hereafter:

- **Appendix 26.1: Detailed water environment information report, Volume 4** of the ES (Document Reference: 6.4.26.1);
- **Appendix 26.2: Flood Risk Assessment, Volume 4** of the ES (Document Reference: 6.4.26.2);
- **Appendix 26.3: Water Framework Directive compliance assessment, Volume 4** of the ES (Document Reference: 6.4.26.3); and
- **Appendix 26.4: Hydrogeological Risk Assessment, Volume 4** of the ES (Document Reference: 6.4.26.4).

26.2 Relevant legislation, planning policy and other documentation

Introduction

26.2.1 This section identifies the legislation, policy and other documentation that has informed the assessment of effects with respect to water environment. Further information on policies relevant to the Environmental Impact Assessment (EIA) and their status is provided in **Chapter 2: Policy and legislative context, Volume 2** of the ES (Document Reference: 6.2.2).

Legislation and national planning policy

26.2.2 **Table 26-1** lists the legislation relevant to the assessment of the effects on water environment receptors.

Table 26-1 Legislation relevant to water environment

Legislation description	Relevance to assessment
The EU Water Framework Directive (2000/60/EC) (WFD), as enacted into domestic law by the Water Environment (Water Framework Directive) (England and Wales) Regulations 2017[1&2]	
The aim of the WFD is for all water bodies to achieve Good Status (comprised of scores for Ecological Status and Chemical Status for surface water and Good Quantitative and Quality Status for groundwater) by 2021 or 2027 as appropriate, and to ensure no deterioration from current status.	The Proposed Development has the potential to have an effect on surface water bodies (coastal waters, transitional waters and rivers) and groundwater bodies during its construction, operation and decommissioning. An assessment is incorporated in this chapter within **Sections 26.9** to **26.11**. A WFD Assessment has been provided in **Appendix 26.3: Water Framework Directive compliance assessment, Volume 4** of the ES (Document Reference: 6.4.26.3) to demonstrate the effect on WFD water bodies and describe the appropriate embedded environmental measures. This will ensure that the Proposed Development will not adversely impact WFD water body Status.
The EU Groundwater Directive (2006/118/EC)	
The aim of the directive is to protect groundwater against pollution caused by dangerous substances.	The Proposed Development has the potential to have an effect on groundwater bodies through the introduction of dangerous substances, during the Construction phase. Appropriate embedded environmental measures have been put forward in **Section 26.7** of this chapter, **Appendix 26.4: Hydrogeological Risk Assessment, Volume 4** of the ES (Document Reference: 6.4.26.4) and in **Chapter 24: Ground conditions, Volume 2** of the ES (Document Reference: 6.2.24)

[1] The fundamental requirements of the EU Water Framework Directive (2000/60/EC) and associated directives were enacted into domestic law by the Water Environment (Water Framework Directive) (England and Wales) Regulations 2017.
[2] Advice Note Eighteen (Planning Inspectorate, 2017) acknowledges that the 2017 regulations places a general duty on the Secretary of State, the Environment Agency to exercise their 'relevant functions' so as to secure compliance with the WFD. It also notes that their functions under the Planning Act 2008 are not deemed 'relevant functions' for this purpose.

Legislation description	Relevance to assessment
	to help ensure the protection of groundwater.
Flood and Water Management Act 2010	
The Flood and Water Management Act sets out the UK Government's proposals to improve flood risk management, water quality and ensure water supplies are more secure.	Appropriate flood and water management will be incorporated through construction and operation to protect local populations, maintain / improve water quality and mitigate the risk of flooding. Existing water supplies are considered within **Appendix 26.1: Detailed water environment information report, Volume 4** of the ES (Document Reference: 6.4.26.1) and flooding and drainage issues are considered in **Appendix 26.2: Flood Risk Assessment, Volume 4** of the ES (Document Reference: 6.4.26.2), with embedded environmental measures identified in **Section 26.7** in this chapter (see **Table 26-20**).
Water Resources Act 1991, Water Act 2003 and The Environmental Permitting (England and Wales) Regulations 2016	
The Water Resources Act 1991 states that it is an offence to cause or knowingly permit polluting, noxious, poisonous or any solid waste matter to enter controlled waters. The Act was revised by the Water Act 2003, which sets out regulatory controls for water abstraction, water impoundment and protection of water resources. Provisions for the regulation of water discharges to controlled waters are set out in the Environmental Permitting (England and Wales) Regulations 2016 and have replaced provisions in the earlier Acts.	These Acts and Regulations set out the permitting and compliance framework which will regulate all site emissions, water abstractions and discharges with the potential to interact with the water environment. There is a requirement for the Proposed Development to obtain a licence for the dewatering of engineering works, in line with the embedded environmental measures set out in **Section 26.7**.

26.2.3 **Table 26-2** lists the national planning policy relevant to the assessment of the effects on water environment receptors.

Table 26-2 National planning policy relevant to water environment

Policy description	Relevance to assessment
Overarching National Policy Statement (NPS) for Energy EN-1 (Department of Energy and Climate Change (DECC), 2011a)	
NPS EN-1 identifies requirements to assess the potential impacts of energy projects on flood risk (Section 5.7), and water quality and water resources (Section 5.15), including consideration of climate change effects over the proposed development lifetime (Section 4.8). Paragraph 5.15.2 requires that "*Where the project is likely to have effects on the water environment, the applicant should undertake an assessment of the existing status of, and impacts of the proposed project on, water quality, water resources and physical characteristics of the water environment as part of the ES or equivalent.*"	Assessments of the effects of the Proposed Development on the aquatic environment (which includes water quality), water resources and flood risk receptors are included on a project-wide basis in this chapter (**Sections 26.6** to **26.11**). The future baseline accounting for climate change is presented in **Section 26.6**. WFD classifications and objectives are taken into account as WFD water bodies themselves are receptors in the assessment and in **Appendix 26.3: Water Framework Directive compliance assessment, Volume 4** of the ES (Document Reference: 6.4.26.3).
NPS EN-1 paragraph 5.7.5 identifies a variety of the minimum requirements for Flood Risk Assessments (FRAs).	An FRA has been undertaken and is provided in **Appendix 26.2: Flood Risk Assessment, Volume 4** of the ES (Document Reference: 6.4.26.2). The assessment sets out what the various requirements are and provides a breakdown of how each requirement has been addressed.
Paragraph 5.7.7 states that "*Applicants for projects which may be affected by, or may add to, flood risk should arrange pre-application discussions with the EA, and, where relevant, other bodies such as Internal Drainage Boards, sewerage undertakers, navigation authorities, highways authorities and reservoir owners and operators. Such discussions should identify the likelihood and possible extent and nature of the flood risk, help scope the FRAs, and identify the information that will be required by the IPC (I [now the Planning Inspectorate] to reach a decision on the application when it is submitted.*"	Discussions have been held with the Environment Agency and Lead Local Flood Authorities (LLFAs) at the Scoping, Preliminary Environmental Information Report (PEIR) and ES stages of the assessment. An FRA has been undertaken and is provided in **Appendix 26.2: Flood Risk Assessment, Volume 4** of the ES (Document Reference: 6.4.26.2).

Policy description	Relevance to assessment
Paragraph 5.15.6 outlines that "*The IPC [now the Planning Inspectorate] should satisfy itself that a proposal has regard to the River Basin Management Plans and meets the requirements of the Water Framework Directive (including Article 4.7) and its daughter directives, including those on priority substances and groundwater.*"	WFD classifications and objectives are taken into account as the WFD water bodies themselves are receptors in the assessment presented in this chapter. They are also considered within the WFD Assessment in **Appendix 26.3: Water Framework Directive compliance assessment, Volume 4** of the ES (Document Reference: 6.4.26.3)
Paragraph 5.15.3 requests that "*The ES should in particular describe:* • *The existing quality of waters affected by the proposed project on water quality, noting any relevant existing discharges, proposed new discharges and proposed changes to discharges;* • *Existing water resources affected by the proposed project on water resources, noting any relevant existing abstraction rates, proposed new abstraction rates and proposed changes to abstraction rates (including any impact on or use of mains supplies and in reference to Catchment Abstraction Management Strategies;* • *Existing physical characteristics of the water environment (including quantity and dynamics of flow) affected by the proposed project and any impact of physical modifications to these characteristics; and* • *Any impacts of the proposed project on water bodies or protected areas under the WFD and Source Protection Zones around potable groundwater abstractions*."	The baseline characteristics of the water environment (which includes water quality, water resources and flood risk) have been provided in **Section 26.6** and associated assessments are provided in **Sections 26.6** to **26.11**. There is also an FRA, WFD Assessment and Hydrogeological Risk Assessment presented within **Appendix 26.2: Flood Risk Assessment, Volume 4** of the ES (Document Reference: 6.4.26.2) and **Appendix 26.3: Water Framework Directive compliance assessment, Volume 4** of the ES (Document Reference: 6.4.26.3), and **Appendix 26.4: Hydrogeological Risk Assessment, Volume 4** of the ES (Document Reference: 6.4.26.4) respectively.
NPS for Electricity Networks Infrastructure EN-5 (DECC, 2011b)	
NPS EN-5 restates the requirements of NPS EN-1 that due consideration and assessment is given to the effects of future climate change on flood risk to electricity transmission infrastructure (Section 2.4). Paragraph 2.4.1 requires that "*Applicants should in particular set out to what extent the proposed development is expected to be vulnerable, and, as appropriate, how it would be resilient to: flooding, particularly*	The FRA presented in **Appendix 26.2: Flood Risk Assessment, Volume 4** of the ES (Document Reference: 6.4.26.2) has addressed the issue of climate change and flood vulnerability resilience.

Policy description	Relevance to assessment
for substations that are vital for the electricity transmission and distribution network; effects of wind and storms on overhead lines; higher average temperatures leading to increased transmission losses; and earth movement or subsidence caused by flooding or drought (for underground cables)."	
National Planning Policy Framework (NPPF) (Ministry of Housing, Communities and Local Government (MHCLG, 2021)	
The NPPF sets out planning policy for England and places a general presumption in favour of sustainable development. The policies relating to planning and flood risk are set out in NPPF paragraphs 159 to 169. Paragraph 5 of the NPPF states that the framework "*does not contain specific policies for nationally significant infrastructure projects*". However, it states that "*these are determined in accordance with the decision-making framework in the Planning Act 2008 (as amended) and relevant national policy statements for major infrastructure, as well as any other matters that are relevant (which may include the National Planning Policy Framework).*"	The NPPF requirements (MHCLG, 2021) are captured within the FRA (**Appendix 26.2: Flood Risk Assessment, Volume 4**) (Document Reference: 6.4.26.2), which presents information on the sequential and exception tests as well as demonstrating that the development will not result in an increase in flood risk from any source of flooding. This assessment includes consideration of climate change in line with NPPF requirements, as agreed with the Environment Agency. It is also carried out in accordance with its supporting technical guidance (Department for Communities and Local Government (DCLG), 2012), taking into account associated vulnerability classifications.

26.2.4 The UK Government published draft NPS EN1-EN5 (Department for Energy Security and Net Zero (DESNZ), 2023a; DESNZ, 2023b)) for consultation in September 2021 and subsequently in March 2023 with further amendments. The 2011 NPSs remain in force until the review is approved (designated) and under proposed transitional arrangements the 2023 amendments will only have effect in relation to applications for development consent accepted for examination after designation. However, the draft emerging NPSs can potentially be relevant planning considerations. Therefore, Rampion 2 has kept abreast of the potential changes to the energy NPSs and incorporated any updates where required in the ES.

26.2.5 **Table 26-3** lists the emerging national planning policy considerations relevant to the assessment of the effects on water environment receptors.

Table 26-3 Emerging national planning policy relevant to water environment

Policy description	Relevance to assessment
Draft Overarching National Policy Statement for Energy (EN-1), (DESNZ, 2023a)	
Draft NPS EN-1 Paragraph 5.8.17 states that *"Development (including construction works) will need to account for any existing watercourses and flood and coastal erosion risk management structures or features, or any land likely to be needed for future structures or features so as to ensure:* *• Access, clearances and sufficient land are retained to enable their maintenance, repair, operation, and replacement, as necessary;* *• Their standard of protection is not reduced;* *• Their condition or structural integrity is not reduced*".	The presence of flood defence structures along the coastal frontage at Climping and along the banks of Rivers Arun and Adur have been taken into account during the design evolution of the Proposed Development via the selection of trenchless crossing methodologies and standoff distances within the outline design. An embedded environmental measure has also been put forward in **Section 26.8** (C-17) for any temporary construction works to be carried out in accordance with the permitting regime to ensure that the condition or structural integrity of these structures are not adversely impacted by the Proposed Development.
Draft NPS EN-1 Section 5.16 further identifies the need to take account of projected impacts of climate change and cumulative effects on existing water resources, physical characteristics of the water environment and on water bodies or protected areas.	The projected impacts of climate change on water resources are taken into account within the future baseline section of this chapter in **Section 26.6** and a cumulative effects assessment in relation to the water environment is presented in **Section 26.12**.
Paragraph 5.16.14 outlines that "*The Secretary of State must refuse development consent where a project is likely to cause deterioration of a water body or its failure to achieve good status or good potential, unless the requirements set out in Regulation 19 are met. A project may be approved in the absence of a qualifying Overriding Public Interest test only if there is sufficient certainty that it will not cause deterioration or compromise the achievement of good status or good potential".*	WFD classifications and objectives are taken into account, as the WFD water bodies themselves are receptors in the assessment presented in this chapter. They are also considered in the WFD Assessment in **Appendix 26.3: Water Framework Directive compliance assessment, Volume 4, Volume 4** of the ES (Document Reference: 6.4.26.3). This assessment demonstrates that the Proposed Development will not adversely impact upon water body objectives, on the basis of the embedded environmental measures set out in **Section 26.7**.

Local planning policy

26.2.6 The study area also crosses the boundaries of several district councils including Arun District Council (ADC), Horsham District Council (HDC), and Mid Sussex

District Council (MSDC). **Table 26-4** lists the local planning policy relevant to the assessment of the potential effects on water environment receptors.

Table 26-4 Local planning policy relevant to water environment

Policy description	Relevance to assessment
Adoption Arun Local Plan 2011-2031 (July 2018) (ADC, 2018)	
Policy W SP1 Water (ADC, 2018) sets out water efficiency measures in order to protect the water resources and enhance the quality of the water environment which supports a range of habitats and ecosystems.	The policy states that any development will be encouraged to make active use of surface water as a design feature and permitted where it identifies measures to improve and enhance water bodies, coastal habitats or provides additional flood relief. In addition, it states that ADC will support developments which are appropriately located, taking account of flood risk, and promotes the incorporation of appropriate mitigation measures into new development, particularly sustainable drainage systems (SuDS) that reduce the creation and flow of surface water and improves water quality. This policy has been addressed within embedded environmental measures (C-73 and C-140) in **Section 26.7** (see **Table 26-20**) of this chapter, and as part of **Appendix 26.2: Flood Risk Assessment, Volume 4** of the ES (Document Reference: 6.4.26.2).
Policy W DM1 Water (ADC, 2018) supply and quality sets out measures required for the provision of a water supply and measures to ensure good water quality.	The policy states that the provision of water supply for developments should not be detrimental to existing abstractions, river flows, water quality, fisheries, amenity or nature conservation. In addition, any development must illustrate, where necessary, how they have contributed to the protection and enhancement of water bodies identified by the South East River Basin Management Plan (RBMP) (Environment Agency, 2016) objectives. These requirements have been addressed within **Sections 26.9** to **26.11** of this chapter.
Policy W DM2: Flood Risk (ADC, 2018) sets out the requirements for any developments in areas at risk from flooding, identified on the latest Environment Agency flood risk maps (Environment Agency, 2021c) and within the Council's Strategic Flood Risk Assessment (SFRA).	The policy states that developments will only be permitted where a site-specific FRA demonstrates that the development will not increase flood risk elsewhere and will reduce flood risk overall. It also specifies that new site drainage systems are designed to take account of events which exceed the normal design standard, such as consideration of flood flow routing and utilising temporary storage areas, and new schemes need to identify adaptation and mitigation measures. Flood risk is considered within **Appendix 26.2: Flood Risk Assessment, Volume 4** of the ES (Document Reference: 6.4.26.2), and this considers the Arun SFRA.

Policy description	Relevance to assessment
	The route of the onshore cable corridor crosses the lower tidal River Arun area and the Proposed Development takes account of relevant Surface Water Management Plans, Catchment Flood Management Plans and related Flood Defence Plans and strategies such as the Lower Tidal River Arun Strategy (Environment Agency, 2012).
Policy W DM3 (ADC, 2018): SuDS sets out the requirement to identify opportunities in the early stage of the design process of a development to incorporate a range of SuDS to increase the levels of water capture and storage and improve water quality.	Drainage design to manage and, if necessary, treat surface water run-off will be included in all elements of temporary and permanent infrastructure of the Proposed Development. As set out in **Section 26.7** of this chapter and **Appendix 26.2: Flood Risk Assessment, Volume 4** of the ES (Document Reference: 6.4.26.2), drainage design will follow the SuDS hierarchy with preference being given to local infiltration of surface water run-off from new areas of hardstanding, where possible, and appropriate mitigation has been embedded into the design to ensure the maintenance of overland flow pathways or areas of known surface water flooding appropriate measures.
Horsham District Planning Framework (2015–2031)[3] (HDC, 2015)	
Policy 24 (HDC, 2015): Environmental Protection sets out the issues related to maintaining, and where necessary improving, the quality of the environment.	The route of the onshore cable corridor crosses areas identified as at risk of flooding and this policy states that HDC will ensure that surface water flooding is managed to prevent the contamination of watercourses. This policy has been addressed as part of embedded environmental measures (C-8 and C-73) set out in **Section 26.7** (see **Table 26-20**) of this chapter and within **Appendix 26.2: Flood Risk Assessment, Volume 4** of the ES (Document Reference: 6.4.26.2).
Policy 35 (HDC, 2015): Climate Change sets out measures which should be used to mitigate the effects of climate change and to meet the district's carbon reduction targets as set out	The policy states that any development must be designed so that it can adapt to the impacts of climate change, particularly in terms of flood risk, water supply and changes to the district's landscape in terms of providing appropriate flood storage capacity and the use of SuDS to help reduce surface water runoff and provide flood storage capacity. This policy has been addressed as part of

[3] Based on information from the Horsham District website https://www.horsham.gov.uk/planning/local-plan [Accessed 25 May 2023], it is understood that a Regulation 19 document is to be published in the future. Any changes have effectively been put on hold until further notice due to recent changes in the NPPF (MHCLG, 2021). In the meantime the current (2015 – 2031 (HDC, 2015)) planning framework remains applicable.

Policy description	Relevance to assessment
in the Council's Acting Together on Climate Change Strategy, 2009 (HDC, 2009).	embedded environmental measures (C-73 and C-140) set out in **Section 26.7** (see **Table 26-20**) of this chapter and within **Appendix 26.2: Flood Risk Assessment, Volume 4** of the ES (Document Reference: 6.4.26.2).
Policy 37 (HDC, 2015): Sustainable Construction sets out measures to improve the sustainability of developments.	The policy states that sustainable design measures should be put in place to minimise vulnerability to flooding. This policy has been addressed by a suite of embedded environmental measures set out in **Section 26.7** (see **Table 26-20**) of this chapter and within **Appendix 26.2: Flood Risk Assessment, Volume 4** of the ES (Document Reference: 6.4.26.2).
Policy 38 (HDC, 2015): Flooding Development sets out measures that proposals will follow with respect to flood risk management.	The policy states that priority will be given to development sites with the lowest risk of flooding and making required development safe without increasing flood risk elsewhere. The route of the onshore cable corridor crosses areas identified as at risk of flooding, and any development proposals should take a sequential approach to ensure most vulnerable uses are placed in the lowest risk areas. In addition, floodplains (Flood Zone 3b) should be avoided and development is only acceptable in Flood Zones 2 and 3 following completion of tests, such as those within the recommendations set out in the Horsham District SFRA (HDC, 2010). The policy also states that proposals will require a site-specific FRA for all developments over 1 hectare in Flood Zone 1 and all proposals in Flood Zones 2 and 3. This policy has been addressed as part of embedded environmental measures set out in **Section 26.7** (see **Table 26-20**) of this chapter and within **Appendix 26.2: Flood Risk Assessment, Volume 4** of the ES (Document Reference: 6.4.26.2)**.**
Mid Sussex District Plan (2014-2031) (Adopted March 2018) (MSDC, 2018)	
Policy DP41 (MSDC, 2018): Flood Risk and Drainage sets out how development proposals will be considered within areas at risk of flooding. The objective is to promote development that makes the best use of resources and increases the sustainability of communities and their	The policy states that an SFRA (MSDC, 2015) has been prepared to identify areas that are at risk from flooding and associated mapping is kept up-to-date with data from recent flood events and Environment Agency information. Development proposals in areas at risk of flooding should be supported by site-specific flood risk assessments. The SFRA (MSDC, 2015) provides information on the use of SuDS to avoid increased flood risk or adverse impacts on water quality. SuDS should be sensitively designed and located to promote improved biodiversity. This policy has been addressed as part of embedded environmental measures set out in **Section 26.7** (see **Table 26-20**) of this chapter and within **Appendix 26.2: Flood Risk**

Policy description	Relevance to assessment
ability to adapt to climate change.	**Assessment, Volume 4** of the ES (Document Reference: 6.4.26.2). The policy also states that proposals for development will need to follow a sequential risk-based approach, ensure development is safe across its lifetime and not increase the risk of flooding elsewhere. The SFRA (MSDC, 2015) should be used to identify areas at present and future flood risk from a range of sources including fluvial (rivers and streams), surface water (pluvial), groundwater, infrastructure and reservoirs. Particular attention will be paid to those areas that have experienced flooding in the past and proposals for development should seek to reduce the risk of flooding by achieving a reduction from existing run-off rates. The policy also states that the preferred hierarchy of managing surface water drainage from any development is: 1. Infiltration measures; 2. Attenuation and discharge to watercourses; and, if these cannot be met; and 3. Discharge to surface water-only sewers. Land that is considered to be required for current and future flood management will be safeguarded from development and proposals will have regard to relevant flood risk plans and strategies. This policy has been addressed in **Section 26.7** (see **Table 26-20**) of this chapter and within **Appendix 26.2: Flood Risk Assessment, Volume 4** of the ES (Document Reference: 6.4.26.2).
Policy DP42 (MSDC, 2018): Water Infrastructure and the Water Environment sets out its objectives of promoting development that makes the best use of resources and increases the sustainability of communities and its ability to adapt to climate change.	This policy requires any new development proposals to be in accordance with the European WFD (2000) to prevent deterioration of water quality and to achieve Good Ecological Status in coastal waters, estuaries and rivers, together with Good Status of groundwater by at least 2027. This policy has been addressed within **Sections 26.9** to **26.11** of this chapter and **Appendix 26.3: Water Framework Directive compliance assessment, Volume 4** of the ES (Document Reference: 6.4.26.3).
South Downs Local Plan 2014-2033 (Adopted July 2019) (South Downs National Park Authority (SDNPA), 2019)	
Policy SD17 (SDNPA, 2019): Protection of the	This policy states that water quality and quantity should be conserved and enhanced to achieve requirements of the

Policy description	Relevance to assessment
Water Environment sets out the requirement of development proposals to conserve and enhance aspects of groundwater, surface water features and watercourse corridors.	WFD (2000) or its replacement. In addition, the ability of groundwater, surface water features and watercourse corridors to function by natural processes throughout seasonal variations, within the immediate vicinity, and both upstream and downstream, of the site of any proposal should be considered. It states that development proposals must conserve watercourse corridor biodiversity and that maintenance is carried out for flood risk management purposes. The policy states that development within groundwater Source Protection Zones (SPZs) will only be permitted provided that there is no adverse impact on the quality of the groundwater source, and provided there is no risk to its ability to maintain a water supply, and any development must incorporate measures to eliminate risk of pollution to groundwater, surface water and watercourse corridor features that would harm their ecological and / or chemical status. This policy has been addressed by a suite of embedded environmental measures in **Section 26.7** (see **Table 26-20**), and further considered in **Section 26.9** to **26.11** of this chapter as well as the Hydrogeological Risk Assessment in **Appendix 26.4: Hydrogeological Risk Assessment, Volume 2** of the ES (Document Reference: 6.4.26.4).
Policy SD49 (SDNPA, 2019): Flood Risk Management sets out how development proposals should seek to reduce the impact and extent of flooding.	This policy requires that development is away from areas of flood risk as identified by the Environment Agency and the SFRA (HDC, 2010), and preferably within Flood Zone 1, wherever possible, and should be accompanied by a site-specific FRA. It also states that proposed developments should not increase the risk of flooding elsewhere and should, wherever possible, reduce overall flood risk and ensure that the integrity of coastal and river flood defences are not undermined. In addition, flood protection, mitigation and adaptation measures should be necessary and appropriate to the specific requirements of the proposal, the development site and other areas potentially impacted. This policy has been addressed within a suite of embedded measures in **Section 26.7** (see **Table 26-20**), and **Appendix 26.2: Flood Risk Assessment, Volume 4** of the ES (Document Reference: 6.4.26.2).
Policy SD50 (SDNPA, 2019): Sustainable Drainage Systems sets out how flood risk management opportunities should be sought to reduce	This policy states that development proposals will be permitted where they ensure that there is no net increase in surface water run-off, taking account of climate change. Major developments will only be permitted where they provide suitable SuDS unless it is demonstrated to be inappropriate, and should adopt suitable sustainable

Policy description	Relevance to assessment
the overall level of flood risk.	drainage systems where required by the LLFA. In addition, the policy states that where SuDS are provided, arrangements must be put in place for their whole life management and maintenance. This policy has been addressed in **Section 26.7** of this chapter and within **Appendix 26.2: Flood Risk Assessment, Volume 4** of the ES (Document Reference: 6.4.26.2).
West Sussex LLFA Culvert Policy (West Sussex County Council (WSCC), 2021)	
"*West Sussex Local Authorities are in general opposed to the culverting of watercourses because of the potential for adverse effect on flood risk and ecology. The Competent Authority will therefore adopt a precautionary principle and only approve an application to culvert an ordinary watercourse if there is no reasonably practicable alternative or if the potential negative impact of culverting would be so minor that they would not justify a more costly alternative.*" The Culvert Policy states that *"a culvert will not be considered until alternatives have been considered, for example:* *- Clear span bridges;* *- Revision of the site layout to incorporate an open watercourse that can be easily maintained; or* *- Diverting the watercourse without loss of its hydraulic flow characteristics.* *In all cases and where it is appropriate to do so, compensation in full is to be provided for any loss in storage capacity or habitat.*" (WSCC, 2021)	Some culverts are proposed by the Proposed Development (as opposed to clear span bridges) associated with the temporary construction haul road / running track on the basis of their temporary nature. There will be full removal and restoration undertaken to restore the watercourse to its previous state upon completion of temporary construction works. This is provided to meet these culvert design requirements set out in the WSCC Culvert Policy (WSCC, 2021). Importantly this WSCC Culvert Policy (2021) is principally aimed at proposals for permanent culverts, none of which are being put forward as part of the Proposed Development.

Other relevant documentation

26.2.7 A number of bodies with responsibility for management and regulation of the water environment have produced guidance that is relevant to this assessment.

26.2.8 The Environment Agency is the lead statutory body with responsibility for protection of the water environment in England. The Environment Agency is responsible for flood defence and drainage for Main Rivers[4] and estuarine and coastal areas. The Environment Agency has produced regional management plans and strategies for the water environment relevant to this assessment, as follows:

- *South East RBMP* (Environment Agency, 2016);
- *Rivers Arun to Adur Flood and Erosion Management Strategy 2010 – 2020* (Environment Agency, 2011);
- *River Arun to Pagham Flood and Coastal Erosion Risk Management Strategy* (Environment Agency, 2015);
- *Arun and Western Streams Catchment Flood Management Plan* (Environment Agency, 2009a); and
- *River Adur Catchment Flood Management Plan* (Environment Agency, 2009b). This identified WSCC as the LLFA (as defined by the Flood and Water Management Act, 2010) that covers the Study Area. LLFAs coordinate flood management for all Ordinary Watercourses[5] plus flooding from other sources, including surface water, groundwater and the sewer network. WSCC's *Preliminary Flood Risk Assessment* (WSCC, 2011) and *Local Flood Risk Management Strategy* (LFRMS) (WSCC, 2014) are of relevance to this assessment.

26.2.9 Each of the local planning authorities (ADC, HDC and MSDC) have produced a SFRA (ADC, 2016; HDC, 2010; MSDC, 2015) to support the development of their local plans outlined in the section above (in **Table 26-4**). The SFRAs are reviewed as part of the baseline assessment in the Flood Risk Assessment presented in **Appendix 26.2: Flood Risk Assessment, Volume 4** of the ES (Document Reference: 6.4.26.2).

26.2.10 The Hydrogeological Risk Assessment in **Appendix 26.4: Hydrogeological Risk Assessment, Volume 4** of the ES (Document Reference: 6.4.26.4) also carries out a more detailed review of the Environment Agency guidance listed in **paragraph 26.2.11** which is particularly relevant to the protection of groundwater.

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[4] Main rivers are usually larger rivers and streams. The Environment Agency carries out maintenance, improvement or construction work on main rivers to manage flood risk. They are shown on the main rivers map: [online] Available at: https://www.arcgis.com/apps/webappviewer/index.html?id=17cd53dfc524433980cc333726a56386 [Accessed 14 December 2022]

[5] An Ordinary Watercourse is a smaller stream or ditch which drains away water. WSCC regulates all works on Ordinary Watercourses that require an Ordinary Watercourse Consent (OWC).

26.2.11 The following good practice guidance that has also been taken into account during the assessment includes, but is not limited to, the following:

- The Environment Agency's Approach to Groundwater Protection (Environment Agency, 2017a), updating its previous Groundwater protection: principles and practice (GP3, Environment Agency 2013);
- Discharges to Surface Water and Groundwater: Environmental Permits (Environment Agency, 2021a);
- Groundwater Activity Exclusions from Environmental Permits (Environment Agency, 2018a);
- Groundwater Risk Assessment for your Environmental Permit (Environment Agency, 2018b);
- CIRIA C648 Control of Water Pollution from Linear Construction projects: Technical Guidance (Construction Industry Research and Information Association (CIRIA), 2006);
- CIRIA C741 Environmental Good Practice on Site (CIRIA, 2015);
- CIRIA Report C624: Development and Flood Risk – Guidance for the Construction Industry (CIRIA, 2004);
- Defra: Construction Code of Practice for the Sustainable Use of Soils on Construction Sites (Department for Environment and Rural Affairs (Defra), 2009);
- Netregs Guidance for Pollution Prevention (GPPs) (Netregs, 2022); and
- Environment Agency Pollution Prevention Guidance (PPG) Notes (2014, now discontinued).

26.3 Consultation and engagement

Overview

26.3.1 This section describes the stakeholder engagement undertaken for Rampion 2. This consists of early engagement, the outcome of, and response to, the Scoping Opinion (Planning Inspectorate, 2020) in relation to the water environment assessment, the Evidence Plan Process (EPP), non-statutory consultation and Rampion 2's statutory consultation. An overview of consultation and engagement undertaken for Rampion 2 relevant to the EIA is outlined in **Section 5.4** of **Chapter 5: Approach to the EIA, Volume 2** of the ES (Document Reference: 6.2.5).

26.3.2 Given the social distancing restrictions that have been in place due to the COVID-19 pandemic from 2020 to 2022, during this period technical consultation relating to water environment has taken place online, primarily in the form of conference calls using Microsoft Teams.

Scoping Opinion

26.3.3 Rampion Extension Development Limited (RED) submitted a Scoping Report (RED, 2020) and request for a Scoping Opinion to the Secretary of State (administered by the Planning Inspectorate) on 2 July 2020. A Scoping Opinion was received on 11 August 2020 (Planning Inspectorate, 2020). The Scoping Report (RED, 2020) sets out the proposed water environment assessment methodologies, an outline of the baseline data collected to date and proposed, and the scope of the assessment. **Table 26-5** sets out the comments received in Section 5 of the Planning Inspectorate (2020) Scoping Opinion 'Aspect based scoping tables' and how these have been addressed in this ES. A full list of the Planning Inspectorate Scoping Opinion comments and responses is provided in **Appendix 5.2: Response to the Scoping Opinion, Volume 4** of the ES (Document Reference: 6.4.5.2). Regard has also been given to other stakeholder comments that were received in relation to the Scoping Report.

Table 26-5 Planning Inspectorate Scoping Opinion responses – water environment

Planning Inspectorate ID number	Scoping Opinion comment	How this is addressed in this ES
5.9.1	On construction, operation and maintenance and decommissioning activities resulting in a potential impact on groundwater level (excluding the proposed substation) being scoped out: *"The Inspectorate agrees that as a result of the limited land disturbance during the earthworks associated with the landfall-cable it is unlikely for such activities to culminate in significant effects on groundwater levels. This is also the case in respect of disturbance during the operational and decommissioning stages. The Inspectorate agrees that this matter can be scoped out of the assessment, with the exception of the proposed substation. The ES will assess the potential for significant effects on groundwater levels from the proposed substation as set out in Table 6.10.11. However, the Inspectorate expects the ES will include an*	Onshore substation potential effects and also all effects on groundwater quality are retained in the assessment of effects. In addition to this, potential effects from the onshore cable route on groundwater levels have been scoped back in, in response to the request of the Planning Inspectorate. This assessment is presented in **Sections 26.9** to **26.11** of this chapter.

Planning Inspectorate ID number	Scoping Opinion comment	How this is addressed in this ES
	assessment of potential effects on groundwater quality during all phases and covering all aspects of the Proposed Development where significant effects are likely to occur."	
5.9.2	*"The Scoping Report does not clearly identify the locations where the cable may cross below or run near a river. This should be detailed in the ES. Site-specific assessments for each location should also be undertaken to inform the cable crossing techniques at each main river and where significant effects may occur. Any mitigation and / or design measures relied upon for the purposes of the assessment should be explained in the ES and appropriately secured. Effort should be sought to agree proposed mitigation and reinstatement measures with the relevant consultation bodies."*	An assessment of effects from watercourse crossings is carried out for these watercourses within this chapter in **Sections 26.9** to **26.11**, together with the provision of appropriate embedded environmental measures in **Section 26.7** (see **Table 26-20)**. These embedded environmental measures have been secured as part of the **Outline Code of Construction Practice (COCP)** (Document Reference: 7.2) and to date have been shared and agreed with stakeholders via the consultation process including targeted stakeholder meetings with the Environment Agency and the LLFA (see **Table 26-7**).
5.9.3	*"The assessment in the ES should take into account the potential impacts of climate change as per the latest UK Climate Projections (UKCP18). Effort should be made to agree the climate change model and future flood risk allowance baseline with relevant consultation bodies including the EA and lead local flood risk authority."*	The future baseline accounting for climate change is presented in **Section 26.6** of this chapter, and as part of the FRA presented in **Appendix 26.2: Flood Risk Assessment, Volume 4** of the ES (Document Reference: 6.4.26.2) which also considers flood vulnerability resilience. The climate change model and future flood risk allowance baseline have been discussed and agreed via the consultation process with the Environment Agency and LLFA, as set out in the Flood Risk Assessment within **Appendix 26.2: Flood Risk Assessment, Volume 4** of the ES (Document Reference: 6.4.26.2).

Planning Inspectorate ID number	Scoping Opinion comment	How this is addressed in this ES
5.9.4	*"The ES should clearly include in the baseline a description of existing (and where relevant, proposed) flood defences or flood alleviation measures that could be impacted or required by the Proposed Development."*	The existing flood defences and future options are described in the FRA provided in **Appendix 26.2: Flood Risk Assessment, Volume 4** of the ES (Document Reference: 6.4.26.2) and summarised within **Section 26.6** of this chapter. The FRA includes an assessment of all flood risk effects and associated embedded environmental measures required by the Proposed Development.
5.9.5	*"Where site specific mitigation measures are to be implemented, the ES should describe the mitigation clearly. The ES should also outline how the mitigation measures will be secured through the DCO or other legal mechanism."*	The provision of embedded environmental measures is outlined in **Section 26.7** (see **Table 26-20**) of this chapter and they are secured via the **Outline COCP** (Document Reference: 7.2) and DCO requirements.
5.9.6	*"The Inspectorate notes that little consideration has been given to any potential effects of the Proposed Development on marine water quality specifically (only by proxy in terms of it's bearing on benthic and fish ecology, coastal processes and other relevant aspects). Paragraph 6.10.3 sets out that the study area will encompass surface water bodies (river and transitional) and groundwater bodies but not coastal bodies. The ES should include any potential impacts of the works on marine water and sediment quality, particularly with regard to the two designated in proximity of the proposed cable corridor and landfall site (including cross reference to any standalone WFD assessment and other relevant aspect chapters of the ES). The Inspectorate has also*	The assessment on marine water quality is provided within **Chapter 6: Coastal processes, Volume 2** of the ES (Document Reference: 6.2.6), **Chapter 8: Fish and shellfish ecology, Volume 2** of the ES (Document Reference: 6.2.8) and **Chapter 9: Benthic, subtidal and intertidal ecology, Volume 2** of the ES (Document Reference: 6.2.9), as the receptors are offshore and not land-based. Within this chapter in the assessment (**Sections 26.9** to **26.11**), potential effects from land-based activities at the proposed landfall are considered on the Coastal Sussex WFD water body. A WFD assessment has been provided in **Appendix 26.3: Water Framework Directive compliance assessment, Volume 4** of the ES (Document Reference: 6.4.26.3) for

Planning Inspectorate ID number	Scoping Opinion comment	How this is addressed in this ES
	made comments to this effect in section 4.10 of this Opinion in respect of the proposed nature conservation aspect chapter."	all WFD bodies under consideration.

26.3.4 In **Table 26-6** regard has been given to other stakeholder comments that were received in relation to the Scoping Report.

Table 26-6 Other scoping stakeholder responses for the water environment

Stakeholder Comment	How this is addressed in the ES and DCO Application
Environment Agency Comments	
The Environment Agency notes that only very little consideration has been given to any potential effects of the Proposed Development on marine water quality.	The assessment on marine water quality is within **Chapter 6: Coastal processes, Volume 2** of the ES (Document Reference: 6.2.6), **Chapter 8: Fish and shellfish ecology, Volume 2** of the ES (Document Reference: 6.2.8) and **Chapter 9: Benthic, subtidal and intertidal ecology, Volume 2** of the ES (Document Reference: 6.2.9), as the receptors are offshore and not land-based. Within this chapter in the assessment (**Sections 26.9** to **26.11**), potential effects from land-based activities at the proposed landfall are considered on the Coastal Sussex WFD water body. A targeted WFD assessment has been undertaken in **Appendix 26.3: Water Framework Directive compliance assessment, Volume 4** of the ES (Document Reference: 6.4.26.3) and this incorporates findings from each relevant aspect.
The impacts on water quality from increases in suspended sediment concentrations will need to be considered, in particular those related to re-suspension of contaminated sediments near the designated Bathing Waters. Potential effects should be assessed during construction and maintenance.	This chapter considers impacts to water quality pertaining to the onshore environment. As above, **Chapter 6: Coastal processes, Volume 2** of the ES (Document Reference: 6.2.6), **Chapter 8: Fish and shellfish ecology, Volume 2** of the ES (Document Reference: 6.2.8) and **Chapter 9: Benthic, subtidal and intertidal ecology, Volume 2** of the ES (Document Reference: 6.2.9) carries out the assessment covering impacts on water quality for the offshore environment. **Chapter 17: Socio-economics,**

Stakeholder Comment	How this is addressed in the ES and DCO Application
	Volume 2 of the ES (Document Reference: 6.2.17) considers potential socio-economic impacts related to use of bathing waters. This chapter (**Sections 26.9** to **26.11**) considers (inter-related) potential impacts on onshore receptors such as the tidal section of the River Arun and Coastal Sussex WFD water body from landfall works and onshore temporary construction corridor works. A WFD assessment has been provided in **Appendix 26.3 Water Framework Directive compliance assessment, Volume 4** of the ES (Document Reference: 6.4.26.3) and this considers the potential for contaminated sediments near bathing waters.
A WFD assessment will be required for this development. The Environment Agency recommends including this as a standalone chapter in the report.	A WFD assessment has been provided in **Appendix 26.3: Water Framework Directive compliance assessment, Volume 4** of the ES (Document Reference: 6.4.26.3).
The WFD assessment should include any potential impacts of the works on marine water and sediment quality, particularly with regard to the two designated Bathing Waters (Middleton-on-Sea, Littlehampton) in proximity of the proposed onshore cable corridor and landfall site. Elements of the proposed works will result in the mobilisation of sediments and associated contaminants, potentially including faecal bacteria. This presents an increased risk to bathing water quality during the bathing water season (May – September). While the Environment Agency acknowledges that impacts on water quality from increases in suspended sediment concentrations will be temporary, even a small and temporary increase in background faecal bacterial load has the potential to impact on bathing water compliance at a designated bathing water.	As covered above, consideration of this is covered within **Chapter 6: Coastal processes, Volume 2** of the ES (Document Reference: 6.2.6), **Chapter 8: Fish and shellfish ecology, Volume 2** of the ES (Document Reference: 6.2.8), **Chapter 9: Benthic, subtidal and intertidal ecology, Volume 2** of the ES (Document Reference: 6.2.9)**, Chapter 17: Socio-economics, Volume 2** of the ES (Document Reference: 6.2.17) and **Appendix 26.3: Water Framework Directive compliance assessment, Volume 4** of the ES (Document Reference: 6.4.26.3). A full assessment on the potential for mobilisation sediments (and sediment bound bacteria) on the compliance of Middleton-on-Sea and Littlehampton Bathing Waters is provided in **Appendix 26.3: Water Framework Directive compliance assessment, Volume 4** of the ES (Document Reference: 6.4.26.3). A consideration for the potential for the release of contaminants is provided in **Appendix 26.3: Water Framework Directive compliance assessment, Volume 4** of the ES (Document Reference: 6.4.26.3) which concludes that the

Stakeholder Comment	How this is addressed in the ES and DCO Application
	Proposed Development will not impact on bathing water compliance at these locations.
The Environment Agency advises that the applicant should assess even short-term effects as part of the WFD assessment. This will be particularly relevant in the context of any activities that may give rise to increased suspended sediment concentrations in proximity to sensitive areas. Suitable evidence of no likely impact will be required for any marine works.	The assessment of onshore-based effects on WFD water bodies is presented in **Sections 26.9** to **26.11** of this chapter, and **Appendix 26.3: Water Framework Directive compliance assessment, Volume 4** of the ES (Document Reference: 6.4.26.3), and this includes short term effects relating to the disturbance and mobilisation of sediments. As noted above, **Chapter 6: Coastal processes, Volume 2** of the ES (Document Reference: 6.2.6), **Chapter 8: Fish and shellfish ecology, Volume 2** of the ES (Document Reference: 6.2.8) and **Chapter 9: Benthic, subtidal and intertidal ecology, Volume 2** of the ES (Document Reference: 6.2.9) also consider short term effects on the offshore marine environment. A full assessment on the potential for reduction in water clarity and potential deterioration on the status of coastal and transitional water bodies is provided in **Appendix 26.3: Water Framework Directive compliance assessment, Volume 4** of the ES (Document Reference: 6.4.26.3)**.** This assessment provides quantified evidence to provide assurance that there will be no likely impact on coastal and transitional water bodies.
The WFD assessment should follow the 'Clearing the Waters for All' guidance (Environment Agency 2017b).	This guidance (Environment Agency, 2017b) has been taken into account in the WFD assessment in **Appendix 26.3: Water Framework Directive compliance assessment, Volume 4** of the ES (Document Reference: 6.4.26.3).
A WFD assessment should comprise either: • an explanation of why the activity has been screened out; or • an explanation of why all elements have been scoped out, ideally using the scoping template; or • an impact assessment.	In **Appendix 26.3: Water Framework Directive compliance assessment, Volume 4** of the ES (Document Reference: 6.4.26.3), screening has been carried out based on whether there is a potential connection between the WFD water bodies and activities.

Stakeholder Comment	How this is addressed in the ES and DCO Application
The Environment Agency states that the size and scale of the WFD assessment should be proportional to the risk posed by the potential works, but the applicant must demonstrate that they have assessed the risks and provided mitigation where necessary.	The assessment for WFD water bodies conducted at the ES stage in **Appendix 26.3: Water Framework Directive compliance assessment, Volume 4** of the ES (Document Reference: 6.4.26.3) is commensurate with the risks posed by the potential works, and a suite of mitigation has been secured and included in that document and **Section 26.7** (see **Table 26-20**) of this chapter.
For water quality specifically applicants should assess impacts for activities that potentially increase suspended sediment concentrations in proximity to Bathing Waters and Shellfish Waters, including short-term effects. In order to assess the risks, an estimate of the volume of sediment disturbed during the activity is required. Sediment sampling might be required if the volume of disturbed sediment is significant, or where heavy contamination is expected. Where risks to water quality are identified, measures have to be taken to avoid or mitigate potential impacts.	The assessment for WFD water bodies for onshore-based effects is presented in **Sections 26.9** to **26.11** of this chapter and **Appendix 26.3: Water Framework Directive compliance assessment, Volume 4** of the ES (Document Reference: 6.4.26.3). This includes short term effects relating to the disturbance and mobilisation of sediments, for instance at the landfall. As noted above, **Chapter 6: Coastal processes, Volume 2** of the ES (Document Reference: 6.2.6), **Chapter 7: Other marine users, Volume 2** of the ES (Document Reference: 6.2.7), **Chapter 8: Fish and shellfish ecology, Volume 2** of the ES (Document Reference: 6.2.8) and **Chapter 9: Benthic, subtidal and intertidal ecology, Volume 2** of the ES (Document Reference: 6.2.9) have considered short term impacts on the offshore marine environment in proximity to Bathing Waters and Shellfish Waters. A full assessment on the potential for mobilisation sediments (and sediment-bound bacteria) on the compliance of Middleton-on-Sea and Littlehampton Bathing Waters is provided in **Appendix 26.3: Water Framework Directive compliance assessment, Volume 4** of the ES (Document Reference: 6.4.26.3). No designated Shellfish Waters have been identified within 2km of the proposed DCO Order Limits. Sediment sampling has been undertaken by RED to determine the levels of potential contamination within the offshore cable corridor as described **Appendix 26.3: Water Framework Directive**

Stakeholder Comment	How this is addressed in the ES and DCO Application
	compliance assessment, Volume 4 of the ES (Document Reference: 6.4.26.3). Details of the embedded environmental measures of relevance to this WFD assessment are provided in **Appendix 26.3: Water Framework Directive compliance assessment, Volume 4** of the ES (Document Reference: 6.4.26.3).
The Environment Agency states that examples of mitigation should consider the timing of works, such as the following: 1) Work around low water to avoid stirring up any sediment into the water column; 2) Plan activities to occur outside the bathing water season. Methodology also needs to be considered: 3) Land-based or marine plant; 4) Choice of dredger e.g. backhoe dredging is less likely to increase suspended sediment concentrations than water injection dredging; and 5) Use of temporary bunds or silt curtains.	The assessment on marine water quality is within **Chapter 6: Coastal processes, Volume 2** of the ES (Document Reference: 6.2.6), **Chapter 8: Fish and shellfish ecology, Volume 2** of the ES (Document Reference: 6.2.8) and **Chapter 9: Benthic, subtidal and intertidal ecology, Volume 2** of the ES (Document Reference: 6.2.9) as the receptors are offshore and not land-based. These chapters are where the main assessment for bathing waters and marine waters is provided. This includes an outline of embedded environmental measures, and the consideration of dredging and construction methods.
The chemical water quality risk posed by disturbing a volume of sediment will always depend on the pre-existing water quality, the levels of contaminant present in the sediment being disturbed and the potential for dilution within the receiving water body. As water bodies vary considerably in size, a significant volume for a small water body might be insignificant in a larger one. In estuaries, tidal state and freshwater flow in the context of available dilution may vary considerably, and the choice of timing of the works will be important.	**Appendix 26.3: Water Framework Directive compliance assessment, Volume 4** of the ES (Document Reference: 6.4.26.3) considers all potential effects on WFD water bodies as a result of both onshore and offshore proposals. This chapter considers the transitional tidal extent of the Arun watercourse which is within the same catchment as the proposed landfall and the southern section of the onshore cable corridor (**Section 26.6** and **Appendix 26.1: Detailed water environment information report, Volume 4** of the ES (Document Reference: 6.4.26.1)). Environmental measures have been embedded into the design of the Proposed Development, including timing of onshore works with respect to river flow levels in the estuary (see **Table 26-20** in **Section 26.7**). **Chapter 24: Ground conditions, Volume 2** of the ES

Stakeholder Comment	How this is addressed in the ES and DCO Application
	(Document Reference: 6.2.24) considers onshore ground conditions and the potential for mobilisation of any contaminants from sediment, whilst **Chapter 6: Coastal processes, Volume 2** of the ES (Document Reference: 6.2.6), **Chapter 8: Fish and shellfish ecology, Volume 2** of the ES (Document Reference: 6.2.8) and **Chapter 9: Benthic, subtidal and intertidal ecology, Volume 2** of the ES (Document Reference: 6.2.9) considers marine water quality and the timing of offshore works.
The Environment Agency states that onshore construction is likely to cross several watercourses that have WFD status, including the main River Arun. Therefore, it will be necessary to demonstrate how this development could contribute to the delivery of WFD actions on these impacted water bodies.	An assessment of effects from watercourse crossings is carried out for these watercourses within this chapter in **Sections 26.9** to **26.11**, together with the provision of appropriate embedded environmental measures in **Section 26.7**. A WFD Assessment is presented in **Appendix 26.3: Water Framework Directive compliance assessment, Volume 4** of the ES (Document Reference: 6.4.26.3) which demonstrates compliance with WFD objectives for water bodies, including the River Arun.
The Environment Agency would expect to see the impacts of any intrusive works or horizontal directional drilling (HDD) through any sensitive locations such as SPZs and Principal Aquifers adequately assessed in the ES. The proposed onshore route from the landfall site at Climping through to Bolney may go through the SPZ for the public drinking supply at Hardham, and this would need to be addressed for impacts.	The assessment outlined in **Sections 26.9** to **26.11** and **Appendix 26.4: Hydrogeological Risk Assessment, Volume 4** of the ES (Document Reference: 6.4.26.4) includes consideration of potential effects on groundwater quantity and quality supporting licensed abstractions including public water drinking supplies and SPZs (identified in **Appendix 26.1: Detailed water environment information report, Volume 4** of the ES (Document Reference: 6.4.26.1) and **Appendix 26.4: Hydrogeological Risk Assessment, Volume 4** of the ES (Document Reference: 6.4.26.4) and **Section 26.6**. In **Section 26.7** (see **Table 26-20**), and **Appendix 26.4: Hydrogeological Risk Assessment, Volume 4** (Document Reference: 6.4.26.4) specific environmental measures have been embedded into the design of the Proposed Development for SPZs and water supplies. These embedded environmental measures have been considered as part of the onshore design evolution process. The embedded environmental measures will also ensure that each supply is

Stakeholder Comment	How this is addressed in the ES and DCO Application
	protected during the construction, operation and maintenance, and decommissioning phases.
Groundwater SPZs indicate the risk to groundwater supplies from potentially polluting activities and accidental releases of pollutants. Designated to protect individual groundwater sources, these zones show the risk of contamination from any activities that might cause pollution in the area. In this context they are used to inform pollution prevention measures in area which are at a higher risk, and to monitor the activities of potential polluting activities nearby.	The groundwater SPZs have been carefully considered as part of the design of the Proposed Development. Embedded environmental measures set out in **Section 26.7** and **Appendix 26.4: Hydrogeological Risk Assessment, Volume 4** of the ES (Document Reference: 6.4.26.4) help minimise effects on all the relevant public water supplies (identified in **Appendix 26.1: Detailed water environment information report, Volume 4** of the ES (Document Reference: 6.4.26.1)).
The Environment Agency expects to see the impacts and possibility of creating pathways for contaminants assessed adequately within the ES including how these will be managed and monitored through the pollution prevention precautions.	The specific consideration of ground contaminants mobilisation and pathways is covered in **Chapter 24: Ground conditions, Volume 2** of the ES (Document Reference: 6.2.24), which also contains sections outlining embedded environmental measures and assessment. The appropriate measures that relate to water environment receptors have also been captured within the list of embedded environmental measures in **Section 26.7** (see **Table 26-20**) of this chapter.
If the cable route passes through areas of contamination, it may create a preferential pathway for contamination to migrate. Any risk assessment for the areas of known / suspected contamination, specifically historic landfills, must also consider the potential for leachate from the waste mass and the disturbance of any site engineering or containment systems, if applicable. The Environment Agency would welcome site specific discussions in this respect.	**Chapter 24: Ground conditions, Volume 2** of the ES (Document Reference: 6.4.24) identifies the potential sources and pathways for any contaminants from historic landfills, including leachate from waste mass and disturbance of site containment systems. This chapter utilises this information including embedded environmental measures in **Section 26.7** (see **Table 26-20**) to provide an assessment of potential effects on water environment receptors in **Sections 26.9** to **26.11**.
During construction any de-watering activities (from land or from	The terms of this *Temporary dewatering from excavations to surface water* guidance

Stakeholder Comment	How this is addressed in the ES and DCO Application
excavations) must comply with the Environment Agency's Position Statement on Dewatering Temporary Excavations (Environment Agency, 2021d) If this can't be achieved, then the applicant will need to apply for a discharge permit and potentially an abstraction licence as well. This should be recognised in the ES.	(Environment Agency, 2021d) are referenced in this chapter in **Section 26.2** and the need for compliance is included as embedded environmental measures (C-29, C-77, C-134, C-141, C-142) in **Section 26.7** (see **Table 26-20**) and secured via the **Outline CoCP** (Document Reference: 7.2).
The boundary for the proposal is currently shown to be within areas of Flood Zones 3 and 2, both tidal and fluvial. The Environment Agency has particular interest in the proposed works within fluvial areas, particularly where subsoil and topsoil storage is required, both temporary and permanent. It requires a flood risk assessment at the detailed application stage.	An FRA has been carried out and is provided in **Appendix 26.2: Flood Risk Assessment, Volume 4** of the ES (Document Reference: 6.4.26.2) and summarised within **Section 26.6** of this chapter. The FRA includes an assessment of all flood sources including fluvial flood risk.
Based on the application area, the applicant should be aware that the coastal frontage at Climping was severely damaged and overtopped in January and February 2020, and widespread flooding occurred inland as far as the A259 carriageway and beyond. The Environment Agency has since constructed a large shingle embankment, which at the time of writing has held up well when subjected to further high tides.	This has been taken into account within the FRA in **Appendix 26.2 :Flood Risk Assessment, Volume 4** of the ES (Document Reference: 6.4.26.2). Engagement has also been carried out with the Environment Agency to obtain details about the shingle embankment, and details of these defences are summarised in **Appendix 26.2: Flood Risk Assessment, Volume 4** of the ES (Document Reference: 6.4.26.2) and have been taken into account as part of the design of the Proposed Development.
The Environment Agency is reviewing future options for the beach management of the Climping coastal frontage.	**Appendix 26.2: Flood Risk Assessment, Volume 4** of the ES (Document Reference: 6.4.26.2) presents a summary of any future options for flood defences. The future strategies for these defences including natural realignment have informed the design of landfall proposals at the ES stage.

Stakeholder Comment	How this is addressed in the ES and DCO Application
As part of the Environment Agency's internal projects, it should be borne in mind that proposals are being considered for removal of river banks so as to form inter-tidal habitats, particularly in the area of the Adur valley. These areas may be within the route of the proposed cabling.	It has been confirmed that these Environment Agency inter-tidal project areas are not located within, or near to, the onshore cable corridor which crosses the upper non tidal reaches of the River Adur tributaries.
A major flood defence scheme has just been completed in the town of Arundel. These areas may be within the route of the proposed cabling.	**Appendix 26.2: Flood Risk Assessment, Volume 4** of the ES (Document Reference: 6.4.26.2) has identified these flood defences and their attributes which are further upstream of the Proposed Development and not in the vicinity of the proposed cabling.
Historic flood issues have affected the communities of Storrington, Steyning and Bramber. These areas may be within the route of the proposed cabling.	Storrington is in the area of a headwater of the River Arun (not connected to the Proposed Development). Steyning and Bramber are approximately 0.5km – 1.5km downstream of the Proposed Development and therefore it can be confirmed they will not be impacted following implementation of embedded environmental measures set out in **Section 26.7** (see **Table 26-20**) of this chapter.
For the previous Rampion 1 (Brooklands to Bolney) works which impact 'Main River', 'International Drainage Board (IDB) ditches' and 'Ordinary Watercourses', Flood Defence Consents would have been dealt with entirely by the Environment Agency.	Local authorities have initially been consulted as well as the Environment Agency as part of the engagement process. The Proposed Development is within the WSCC LLFA boundary. In addition, the Environment Agency has been consulted with in relation to proposed works on Ordinary Watercourses relating to the River Arun. Discussions regarding flood defence consents and Ordinary Watercourse consents have been discussed with WSCC and the Environment Agency as the design of the Proposed Development has evolved and this will be further discussed at the detailed design stage. **Section 26.7** of this chapter presents these embedded environmental measures (C-17, C-126) which have been secured in the **Outline CoCP** (Document Reference: 7.2) as part of the Proposed Development (see **Table 26-20**).

Stakeholder Comment	How this is addressed in the ES and DCO Application
Whilst the Environment Agency will still deal with works to Main Rivers and the River Arun IDB ditches (the River Adur IDB has since been dissolved), Flood Defence Consents have now been superseded by Flood Risk Activity Permits (FRAPs) and are now subject to a completely different charging mechanism. This also includes the coastal frontage at Climping which would be subject to a FRAP application.	This chapter acknowledges the need for FRAPs in **Section 26.7** (see **Table 26-20)**. In relation to the River Arun, engagement with the Environment Agency has been undertaken for both Main Rivers and what were previously IDB ditches (prior to the River Adur IDB being dissolved). Engagement will continue post-detailed design stages as part of preparation of FRAP applications.
The Environment Agency would welcome a meeting with the Applicant once the cabling route has been firmly established so that all issues can be identified at the earliest stage.	A series of meetings have been held with the Environment Agency outlined in the non-statutory consultation and Evidence Plan Process sub sections within this **Section 26.3**.
As part of the Environment Agency FRAP process opportunities for WFD improvements would be sought.	FRAPs have been set out as part of the embedded environmental measures in **Section 26.7** (see **Table 26-20**) of this chapter with the aim of no deterioration in status as a result of the Proposed Development. A cumulative effects assessment (CEA) has also been carried out to consider other relevant developments in **Section 26.12** in order to clarify that there would be no cumulative effects which would result in deterioration to WFD water body status.
All other watercourses within the area that are known as 'Ordinary Watercourses' will require consent approval from the LLFA, namely WSCC.	This has been acknowledged in **Appendix 26.2: Flood Risk Assessment, Volume 4** of the ES (Document Reference: 6.4.26.2) and relevant part of the embedded environmental measures (C-126, C-142) in **Section 26.7** (**see Table 26-20**) of this chapter.
Works which are on the coastal frontages and tidal watercourses e.g. River Arun and River Adur will not only require a FRAP, but most probably a Marine Management Licence, as well.	The need for Marine Management Organisation (MMO) licensing is considered within **Chapter 6: Coastal processes, Volume 2** of the ES (Document Reference: 6.2.6), **Chapter 8: Fish and shellfish ecology, Volume 2** of the ES (Document Reference: 6.2.8) and **Chapter 9: Benthic, subtidal and intertidal ecology, Volume 2** of the ES (Document Reference: 6.2.9).

Stakeholder Comment	How this is addressed in the ES and DCO Application
The Environment Agency will have a presumption against open cut crossing of watercourses and would always favour cabling being directionally drilled below bed level. Particular permitting concerns at this initial stage in addition to cable crossings would involve temporary works which include dewatering, and as stated earlier any spoil heaps in the flood plain both temporary and permanent which could result in the need for flood storage compensation.	The presumption against open cut trenching methods has been taken into account as part of the design of the Proposed Development. Sensitive watercourses including Main Rivers and WFD watercourses will be crossed by trenchless crossing methods and bridges, whilst minor watercourses and ditches with less sensitivity will be crossed by open cut trenching methods. A suite of embedded environmental measures have been set out in **Section 26.7** (see **Table 26-20**) of this chapter to ensure that potential effects from trenched and trenchless crossing methods of watercourses are minimised. Numerous embedded environmental measures have been included in the design of the Proposed Development to avoid soil storage in flood plains.
Works timings and ecological safeguarding would also be considerations as part of any FRAP application.	Standoff distances (riparian buffers) and the timing of work (drier periods with less surface runoff) have been incorporated into the suite of embedded environmental measures set out in **Section 26.7** (see **Table 26-20**) of this chapter.
HDC Comments	
HDC is in broad agreement with the assessment methodology detailed in the Scoping Report, including that related to Hydrogeology, Hydrology and Flood Risk.	Agreement noted.
The Scoping Report has identified the current areas of flood risk and potential pathways. It should be noted however that there are a number of smaller Ordinary Watercourses, such as ditches, within the study area that may not have been mapped for flood risk due to their catchment size.	The layout of smaller watercourses has been taken into account as part of initial constraints mapping exercises. They have also been initially considered within **Appendix 26.2: Flood Risk Assessment, Volume 4** of the ES (Document Reference: 6.4.26.2) as part of the FRA.
Based on the flood map, parts of the study area are shown to be located within Flood Zones 2 and 3. However the majority of the construction corridor is within Flood Zone 1. As the site contains Flood	**Appendix 26.2: Flood Risk Assessment, Volume 4** of the ES (Document Reference: 6.4.26.2) has set out where the proposed DCO Order Limits cross watercourses and identifies a series of constraints and the need for sequential tests. This has been evidenced as part of the

Stakeholder Comment	How this is addressed in the ES and DCO Application
Zones 2 and 3, the sequential test applies to this development.	FRA which shows how the sequential test has been carried out and that the onshore cable corridor has been designed to avoid areas of flood risk as much as practicable.
The Study Area includes a stretch of the River Adur, its tributaries and impoundments. HDC would encourage the opening up of culverts and other appropriate river restoration or land management techniques to be incorporated with existing flow routes to deliver flood risk and water quality improvements along the cable route, particularly where known upstream flood risk to adjacent areas can be reduced by improving conveyance and storage areas.	The assessment in **Sections 26.9** to **26.11** and appropriate embedded environmental measures in **Section 26.7** (see **Table 26-20**) of this chapter and **Appendix 26.2: Flood Risk Assessment, Volume 4** of the ES (Document Reference: 6.4.26.2) and **Appendix 26.3: Water Framework Directive compliance assessment, Volume 4** of the ES (Document Reference: 6.4.26.3) are focussed on ensuring there is no increase in flood risk and deterioration in water quality associated with the construction and operation of the Proposed Development in accordance with NPPF (MHCLG, 2021) and the WFD. The FRA has been carried out to support the DCO Application and this includes the consideration of flood risk management measures.
WSCC Comments	
WSCC wishes for RED to ensure that Table 6.10.3 is more in keeping with the rest of the EIA (significance evaluation) e.g. for moderate impacts to also be classified as 'significant' in EIA terms, rather than 'potentially significant.'	In the Scoping Report (RED, 2020) in Table 6.10.3, a 'significant' effect corresponded to a Major rating whereas a Moderate rating corresponded to a 'potentially significant' effect at that stage of the EIA process. As noted in **Section 26.1** of this chapter, WSCC observes that *"the approach was subject to further investigation at the ES stage following refinement of design information. This approach will be based on professional judgement and carried out on a precautionary basis"*. Potentially significant effects are assessed based on professional judgement and concluded to be 'significant' or 'non-significant' as is reported in **Section 26.8**.
WSCC as the LLFA is the risk management authority responsible for local flood risk defined as flooding from surface water, groundwater, and Ordinary Watercourses.	Noted. WSCC is part of the EPP stakeholder group and was consulted during the EPP meetings in October 2020, November 2021, June 2022 and November 2022. WSCC as the LLFA will continue to be consulted during post-DCO Application stages.

Stakeholder Comment	How this is addressed in the ES and DCO Application
With regards to requirements for the attenuation of water from the proposed infrastructure, WSCC refers RED to the West Sussex LLFA Policy for the Management of Surface Water (November 2018) (WSCC, 2018) that can be found on the WSCC web site, and all of the relevant guidance within it. Also of relevance is the West Sussex Local Flood Risk Management Strategy (2013 – 2018) (WSCC, 2014) that focusses on the risks of flooding from surface water, groundwater and Ordinary Watercourses. It also considers flooding from rivers and the seas and provides clarification on the roles and responsibilities of WSCC as the LLFA for flood risk management.	This guidance has been acknowledged and taken into account within the FRA (**Appendix 26.2: Flood Risk Assessment, Volume 4** of the ES (Document Reference: 6.4.26.2)).
WSCC welcomes the embedded environmental measure C-75, which states that construction and permanent development in identified floodplains within the Scoping Boundary will be avoided where possible. WSCC expects any work where this cannot be avoided to be robustly justified through the site selection process, and any mitigation proposed to be compliant with all relevant policies, including the NPPF.	These constraints have been identified as part of the onshore design refinement, and a suite of further environmental measures have been embedded into the Proposed Development within **Section 26.7** (see **Table 26-20**) of this chapter to avoid proposals in the floodplain where practicable. These embedded environmental measures are also included as part of the FRA in **Appendix 26.2: Flood Risk Assessment, Volume 4** of the ES (Document Reference: 6.4.26.2) in order to ensure that proposals are fully NPPF compliant.
WSCC has reviewed the 'Rampion 2 Scoping report' and comments in regard to flooding and drainage below. The Key Constraints section considered flooding from rivers and sea as a key constraint but not flooding from surface water or groundwater. Surface water and groundwater are suitably covered in	As noted, Section 6.10 of the water environment scoping chapter (RED, 2020) covered surface water, groundwater and Ordinary Watercourses as important considerations. This is also provided in the baseline **Section 26.6** of this chapter. They have been considered and addressed as constraints as part of the FRA (**Appendix 26.2: Flood Risk Assessment, Volume 4** of the ES (Document Reference: 6.4.26.2)).

Stakeholder Comment	How this is addressed in the ES and DCO Application
Section 6.10 but should perhaps be considered as key constraints too. The potential obstacles section considered Main Rivers as a potential obstacle but not Ordinary Watercourses. Again, Ordinary Watercourses should be considered here too. Section 6.10 covers the Water Environment well and WSCC is happy with its content.	

Evidence Plan Process

26.3.5 EPP has been set up to provide a formal, non-legally binding, independently chaired forum to agree the scope of the EIA and Habitats regulations Assessment (HRA), and the evidence required to support the DCO Application. The EPP commenced in January 2020 and has continued throughout the EIA helping to inform the ES.

26.3.6 For the water environment, further engagement has been undertaken via the EPP Expert Topic Group (ETG) 'Onshore Ecology, Hydrology and Nature Conservation' meeting held by conference calls on 28 October 2020, 23 March 2021, 3 November 2021, 22 November 2022, 7 March 2023 and 22 June 2023. The conference calls were attended by the following stakeholders:

- WSCC;
- Environment Agency;
- Sussex Ornithological Society;
- SDNPA;
- Sussex Wildlife Trust;
- Royal Society for the Protection of Birds;
- Natural England; and
- Ouse and Adur Rivers Trust.

26.3.7 The water environment section of the first ETG meeting on 28 October 2020 covered the proposed scope and methodology of the assessment, key datasets, preliminary findings and onshore temporary construction corridor optioneering constraints including SPZs, watercourse crossings and interactions with flood zones.

26.3.8 The Environment Agency asked whether a watercourse crossing schedule would be provided as part of a DCO Application (see **Appendix 4.1: Crossing schedule, Volume 4** of the ES (Document Reference: 6.4.4.1)). The Environment Agency and WSCC also noted that Environmental Permits and Ordinary Watercourse Crossings would need to be considered as part of the DCO Application. Environmental measures have accordingly been embedded into the design of the Proposed Development within **Section 26.7** (see **Table 26-20**) of this chapter.

26.3.9 The Environment Agency also requested that consideration is given to any potential effects from the Proposed Development on SPZs (for example Patching SPZ) on groundwater levels and associated public water supplies within the Chalk aquifer. Consideration and assessment is presented in **Appendix 26.1: Detailed water environment information report, Volume 4** of the ES (Document Reference: 6.4.26.1) and **Section 26.6** and **Sections 26.9** to **26.11** of this chapter, and in **Appendix 26.4: Hydrogeological Risk Assessment, Volume 4** of the ES (Document Reference: 6.4.26.4). This includes the scoping back in of potential effects on groundwater levels from the onshore temporary construction corridor to address this point.

26.3.10 A second ETG meeting was held for Onshore Ecology, Hydrology and Nature Conservation on 23 March 2021 with the same key stakeholders as the meeting in October 2020.

26.3.11 The water environment section of the second ETG meeting on 23 March 2021 provided further information on the latest design evolution, key data sources, the structure of the water environment assessment in the PEIR and its appendices, potential water environment receptors and the role of embedded environmental measures.

26.3.12 During the second ETG meeting, details were presented for embedded environmental measures which related to works in the floodplain, watercourse crossing methodologies, appropriate standoff distances and stockpile management, dewatering and treatment, protection of water supplies, pollution prevention and remediation.

26.3.13 In regard to watercourse crossing methodologies, it was explained in the second ETG that permanent onshore cable crossings will be under watercourses and not in channel. It was also noted that all Environment Agency main rivers and their flood defences will be crossed via trenchless methods (HDD or similar trenchless crossing technique), to avoid any interactions with floodplains where possible. Other smaller watercourses and ditches will be crossed by open cut trenching methods, and that the associated temporary construction haul road will cross using culverts or clear span bridges depending on their sensitivity.

26.3.14 In relation to evolution of the design of the Proposed Development, the water environment aspect also referenced a key embedded environmental measure (C-137 in **Table 26-20**) which will ensure that there are no activities in SPZ 1, and no drilling or storage of hazardous materials stored in any SPZ.

26.3.15 For WFD water bodies, the criteria for the spatial scope of the preliminary assessment were presented, and it was noted that embedded environmental

measures have been incorporated to minimise disturbance and avoid significant effects on these receptors.

26.3.16 With respect to flood risk screening various potential flood risk sources (tidal, fluvial, surface water) were identified. The key embedded environmental measures were also presented in relation to avoiding loss of floodplain storage in the fluvial floodplain, including the use of temporary trackway where practicable in Flood Zone 3, and where not possible building access routes and working areas in the floodplain as close to the ground as possible. It was also noted that for temporary construction haul road crossings, culverts will be sized based on those of culverts located up or downstream by proxy.

26.3.17 The Environment Agency acknowledged and agreed with this approach in principle and asked that lessons learned from Rampion 1 of ordinary watercourse crossings be taken into account with particular interest in crossings in the River Adur catchment. RED welcomed any advice and asked for any particular points from the Environment Agency be passed on. **Appendix 26.2: Flood Risk Assessment, Volume 4** of the ES (Document Reference: 6.4.26.2) acknowledges relevant policies in relation to sizing culverts and the water environment team will work with engineers from Rampion 1 to ensure that relevant information from that project is utilised and implemented.

26.3.18 A third ETG meeting was held for Onshore Ecology, Hydrology and Nature Conservation on 3 November 2021 with the same key stakeholders as the meeting in October 2020.

26.3.19 The water environment section of the meeting covered the most pertinent feedback from stakeholders in relation to feedback on the first statutory consultation exercise (**Table 26-7**). This included comments from the Environment Agency in relation to the aquatic environment, in particular the need to give due recognition to any migratory fish and potential effects from damming and dewatering, as well as consideration of appropriate mitigation measures and site specific crossing methodologies to reduce any risk. It was noted that biodiversity watercourse crossing surveys had been carried out as part of the terrestrial ecology assessment (as outlined in **Appendix 22.6: Fisheries habitat survey report, Volume 4** of the ES (Document Reference: 6.4.22.6)), and that site-specific trenchless crossing (TC-19/19a) has been incorporated at the crossing near Buncton to minimise potential effects. A protocol for careful reinstatement has been developed and incorporated into an embedded measure (C-64) including seasonal timings and screening of pumps as described in **Section 26.7 (Table 26-20)** of this chapter.

26.3.20 The meeting also covered the need to incorporate some additional baseline information such as SDNPA data on Chalk streams and dew ponds, and Environment Agency default SPZs for private water supplies (PWSs). This has been incorporated into **Appendix 26.1: Detailed water environment information report, Volume 4** of the ES (Document Reference: 6.4.26.1) and **Figures 26.2** and **Figure 26.6, Volume 3** of the ES (Document Reference: 6.3.26) accordingly. The meeting also covered the need for the crossing schedule to be updated at the ES which has since been implemented in **Appendix 4.1: Crossing schedule, Volume 4** of the ES (Document Reference: 6.4.4.1).

26.3.21 A fourth ETG meeting was held on 22 November 2022 with the same stakeholders. The meeting covered relevant updates on the design evolution since the original PEIR (RED, 2021). This included the consideration of the alternatives and modifications outlined in the second statutory consultation exercise (**Table 26-8**), site-specific mitigation at the more sensitive watercourse crossings (at one identified coarse fishery location and several Chalk streams), and the ongoing development of the indicative drainage strategy at the Oakendene onshore substation. The meeting also covered the findings of the PEIR Supplementary Information Report (SIR) published as part of the second statutory consultation exercise (**Table 26-8**) and embedded environmental measures in relation to groundwater protection and the aquatic environment (see **Table 26-20**). At the fourth ETG meeting, the Environment Agency acknowledged the measures as being generally acceptable. WSCC also noted that at Hammerpot and Poling historic flooding had been a problem and ADC and WSCC agreed to share information on this matter. This has since been incorporated into **Appendix 26.2: Flood Risk Assessment, Volume 4** of the ES (Document Reference: 6.4.26.2).

26.3.22 A fifth ETG meeting was held on 7 March 2023 with the same stakeholders. The meeting covered updates on the Hydrogeological Risk Assessment including initial conceptualisation work and site survey results. The consultation feedback from the PEIR Supplementary Information Report (SIR) was also presented along with the findings of further assessment and additional environmental measures to address specific comments. The findings of the FRA were presented in relation to sources of baseline flood risk between Poling and Hammerpot, and a suite of embedded flood risk management measures were discussed to illustrate that the Proposed Development would not increase flood risk in the area. Other commitments were put forward for ground investigation at the landfall to inform detailed design of apparatus, and for a watching brief around karstic solution features within a target area north of Hammerpot (see **Section 26.7**). These environmental measures were well received by Poling Parish Council, the Environment Agency and Southern Water respectively.

26.3.23 A sixth ETG meeting was held on 22 June 2023, in order to present the draft conclusions of the water environment assessment and to cover any outstanding comments that were received in relation to the PEIR Further Supplementary Information Report (FSIR). This included some final information on the embedded environmental measures that have been incorporated into the Proposed Development and clarification on proposals in the River Arun floodplain. It also included confirmation of several of minor road upgrade proposals along Michelgrove Lane within Patching SPZ1 and presentation of specific embedded measures to help minimise any risks posed towards groundwater (see **Section 26.7**).

26.3.24 The sixth ETG meeting also covered considerations in relation to water neutrality policy which had been queried by WSCC and Natural England at the fifth ETG meeting (on 7 March 2023). WSCC had noted that all developments within the Sussex North Zone need to demonstrate that there will be no increase in water usage, and that any additional water usage must be offset, including staff welfare facilities at the onshore substation during the operation and maintenance phase. During the sixth ETG meeting, RED presented further information in relation to water neutrality. This is considered further within **Section 26.7.**

26.3.25 Further information on consultation is provided in the **Evidence Plan** (Document Reference: 7.21).

Non-statutory consultation

Overview

26.3.26 Non-statutory consultation captures all consultation and engagement outside of statutory consultation and has been ongoing with a number of prescribed and non-prescribed consultation bodies and local authorities in relation to water environment. A summary of the non-statutory consultation undertaken since completion of the Scoping Report (RED, 2020) is outlined in this section.

Environment Agency

26.3.27 Engagement with the Environment Agency has been ongoing since June 2020 in the form of emails, conference calls and specific targeted stakeholder meetings discussed in **paragraphs 26.3.28** to **26.3.32**. This has included discussion of a broad range of topics including data requests for baseline data sources, discussions in relation to the future of an existing sea defence along the Climping sea frontage, activities in the floodplain, groundwater protection in relation to various onshore cable route options and consideration of the alternatives and modifications published in the PEIR SIR (RED, 2022) (see **paragraphs 26.3.30 and 26.3.31** on the Environment Agency and Southern Water).

26.3.28 At a meeting on 9 November 2020, the Environment Agency noted that it in principle agreed with the selection of Climping as a landfall location on the basis that there are no other reasonably available locations along the stretch of the coast to make landfall that are not already in development. The Environment Agency also noted that the long-term strategy for the shingle embankment sea defence at the proposed landfall is to allow natural processes to reform a non-natural section into a natural embankment, which would result in a shift of the coastline landwards as part of a natural realignment process.

26.3.29 With regards to temporary construction activities in the floodplain, at a meeting on 22 March 2022, the Environment Agency noted that it agreed in principle with the approaches to soil stockpile management associated with the onshore cable corridor and the temporary construction haul road in the Arun Valley floodplain. The Environment Agency did however request that at a later stage, following the DCO Application submission and prior to the onset of any construction, further detailed information is shared with its permitting team in relation to that flood plain area to ensure that these approaches will be implemented appropriately.

Environment Agency and Southern Water

26.3.30 In regard to the onshore design evolution, the Environment Agency and Southern Water attended meetings on 21 December 2021, 5 May 2022, 14 September 2022 and 6 April 2023.

26.3.31 During each meeting, the latest onshore cable route options were shared with the Environment Agency and Southern Water to obtain feedback from their

groundwater specialists. During the first two meetings (21 December 2021 and 5 May 2022) Southern Water expressed that it would object to any temporary construction corridor trenching proposals which crossed the SPZ1 of its Warningcamp and Patching public water supplies. Southern Water has also shared information on the location of potential karst features (which is presented in **Appendix 26.4: Hydrogeological Risk Assessment, Volume 4** of the ES (Document Reference: 6.4.26.4)). The proposed temporary construction access route along Michelgrove Lane was discussed with both parties during the final meeting (6 April 2023). The construction and operational access route requires minor road upgrades associated with the installation of passing places in the Patching SPZ1 for traffic management purposes. Following each meeting, the views and data from the Environment Agency and Southern Water have been fully taken into account in the final design of the Proposed Development.

26.3.32 Both the Environment Agency and Southern Water have also welcomed each of the embedded environmental measures being put forward including ground investigation, good practices around trenchless crossings and passing places discussed during the meeting on 14 September 2022 and 6 April 2023. Both stakeholders acknowledged these embedded environmental measures as being generally acceptable and welcomed further communication as part of the DCO Application and post application process.

Local Authorities including ADC, HDC and MSDC

26.3.33 Engagement with each of these local authorities has been ongoing since June 2020 mainly in the form of email communications. This initially covered data requests for information on existing PWS information.

26.3.34 ADC was also contacted in August 2021 to ask whether it could verify the source coordinates of the three PWSs screened in for further assessment within its jurisdiction. ADC carried out follow-up visits to each of these properties to confirm the source coordinates. ADC was contacted in April / May 2022 regarding the location of several PWSs, including PWSs at Michelgrove and Angmering Park Stud Farm / Suzy Smith Racing / Angmering Park Estate. The results of these surveys helped to inform the design of the Proposed Development. The surveys were carried out in June 2022 and June 2023 and their findings have been incorporated into **Section 26.6** of this chapter.

26.3.35 MSDC attended a meeting on 1 April 2022 with the LLFA (WSCC) to discuss drainage measures along the onshore cable corridor and at the onshore substation. At that meeting it was noted that following the official announcement of the Oakendene onshore substation site, the proposed DCO Order limits only crossed a very short section of the onshore cable corridor between the onshore substation and the existing National Grid Bolney substation. As such MSDC identified that ADC and HDC would be appropriate stakeholders to consult.

26.3.36 ADC and HDC attended a follow-up meeting with WSCC and RED on 22 June 2022 to discuss the ongoing findings of the FRA. Topics of discussion included the proposed embedded environmental measures for drainage, flood risk management and water quality treatment within the proposed DCO Order Limits at the time, along the onshore cable corridor and at the onshore substation (see **Table 26-20**). ADC and HDC expressed that they were in agreement with the

approach of avoiding the 0.1 percent Annual Exceedance Probability (AEP) Risk of Surface Water Flood Risk zone associated with the watercourse to the south of the onshore substation by way of providing a proxy for the 1 percent AEP event plus climate change (for further details see the FRA in **Appendix 26.2: Flood Risk Assessment, Volume 4** of the ES (Document Reference: 6.4.26.2)). Following the meeting ADC and HDC both expressed that overall they had no concerns or adverse comments regarding the information that was presented.

WSCC

26.3.37 Engagement with WSCC has also taken the form of emails requesting information on relevant flood risk policy, and historical flood risk information to inform the baseline assessment.

26.3.38 As the LLFA, WSCC attended the meeting with ADC and HDC which discussed the FRA and drainage measures. WSCC reflected that it was generally in agreement with the proposals shared, but also noted that it would ultimately defer to the district councils' approval within their respective jurisdictions.

Non-statutory Consultation Exercise – January / February 2021

26.3.39 RED carried out a non-statutory consultation exercise for a period of four weeks from 14 January 2021 to 11 February 2021. This non-statutory consultation exercise aimed to engage with a range of stakeholders including the prescribed and non-prescribed 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.

26.3.40 The key themes emerging from the non-statutory consultation exercise in January 2021 relating to water environment are as follows:

- flood risk and erosion in the coastal area at Climping; and
- details around construction programming and phasing.

26.3.41 Further detail about the results of the non-statutory consultation exercise can be found in the **Consultation Report** (Document Reference: 5.1).

Statutory consultation

First statutory consultation exercise – July to September 2021

26.3.42 Rampion 2's first statutory consultation exercise ran from 14 July to 16 September 2021, a period of nine weeks. The PEIR (RED, 2021) was published as part of Rampions 2's first statutory consultation exercise which provided preliminary information on water environment within Chapter 27: Water environment (RED, 2021).

26.3.43 **Table 26-7** provides a summary of the key themes of the feedback received in the first statutory consultation exercise in relation to water environment and outlines how the feedback has been considered in this ES chapter. A full list of all comments received during the first statutory consultation exercise in 2021 and the

responses to those comments are provided in the **Consultation Report** (Document Reference: 5.1).

Table 26-7 First statutory consultation exercise (July – September 2021) feedback

Theme / Comment	How this is addressed in this ES and DCO Application
ADC	
"*Due to the recent release of the peak river flow allowances incorporating climate change from the 2018 projections, it is advised that 40% should be used in the FRA modelling, especially due to the landfall location being within Flood Zone 3a and the significant inland incursion affected.*"	Climate change allowances are discussed in detail in **Appendix 26.2: Flood Risk Assessment, Volume 4** of the ES (Document Reference: 6.4.26.2). The Flood Risk Screening Assessment carried out a comprehensive review of the (2016) Environment Agency guidance on climate change allowances and this was provided alongside the first statutory consultation exercise in 2021. This covered peak fluvial flows, peak rainfall intensity, sea level rise etc. In a recent stakeholder meeting the flood officer from ADC noted that he had no issues with the findings of that FRA (**Appendix 26.2: Flood Risk Assessment, Volume 4** of the ES (Document Reference: 6.4.26.2)) provided alongside the original PEIR (RED, 2021). The updated FRA in **Appendix 26.2: Flood Risk Assessment, Volume 4** of the ES (Document Reference: 6.4.26.2) now considers the latest 2022 fluvial climate change guidance. This states that the Higher Central allowance for Essential Infrastructure in flood zones and the new recommended allowances have been applied. In the FRA, Table 5-9 considers these peak flow climate change allowances for the South East River Basin District, together with the relevant flood zone development vulnerability combination which applies. Table 5-10 also provides current NPPF (MHCLG, 2021) guidance as a frame of reference.
Environment Agency	
Chapter 26 General Comment: "*Given that the route and substation are not*	Agreement noted. No further action necessary.

Theme / Comment	How this is addressed in this ES and DCO Application
located in any highly sensitive location with respect to groundwater, we agree that the measures and approaches as outlined are sufficient."	
Chapter 26 PWS: "*While we do not have any fundamental issues with the conclusions of the risk assessment, we have concern about non-licenced potable supplies being classed as low resource value. Though they may only represent a minor abstraction, they can be the sole drinking water supply for individuals, in locations discreet from public water supply. Capacity for monitoring these to ensure that they are not impacted is also likely to be limited. As such they can be vulnerable for impaction. As such ensuring that they are protected is a high priority. Their resource value should reflect this*."	The value of the PWS receptor has been updated. Medium value has been given to PWSs in **Table 26-21** and in the assessments in **Section 26.9** to **26.11** to better reflect their importance as suggested.
Chapter 26 PWS: *"C-137 All proposed infrastructure and construction activities will be sited outside of the inner SPZs (SPZ1) for the Southern Water Warning camp and Burpham borehole 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."*	Noted. Due to further evolution of the onshore elements of the Proposed Development between the provision of PEIR and the ES, the proposed temporary construction corridor crosses SPZ2 of the Angmering and Patching Southern Water public water supplies. The only activities within SPZ1 for Warningcamp are for a light construction and operational access track (A-25). The use of existing farm tracks, entrances and 4 x 4 vehicles will ensure that there will be no ground disturbance within the Warningcamp SPZ1. As discussed with Southern Water (at the 6 April 2023 meeting), the proposals for construction and operational access along Michelgrove Lane in Patching SPZ1 will require minor localised road upgrades at several locations. A range of embedded environmental measures have been provided as part of a detailed Hydrogeological Risk Assessment in **Appendix 26.4: Hydrogeological Risk Assessment, Volume 4** of the ES (Document Reference: 6.4.26.4) (and in

Theme / Comment	How this is addressed in this ES and DCO Application
	Section 26.7 of this chapter, see **Table 26-20**), as recommended by Southern Water.
"*We welcome confirmation that no infrastructure and construction activities will take place inside the SPZ1 for the named (public water supply) sources. We would welcome the confirmation regarding limiting higher risk activities inside the SPZ2. Please also note that there are default 50m SPZ1 around private water supplies used for potable purposes. A default 250m SPZ2 would also generally be implemented around these sources*."	As detailed in C-137 in **Section 26.7**, there will be no groundworks within Warningcamp SPZ1 as light temporary construction access will utilise existing farm tracks near Hill Barn. The minor road upgrades along Michelgrove Lane within Patching SPZ1 will be carried out in accordance with specific embedded environmental measures (C-250, and C-251 in **Table 26-20**) to minimise any potential risks posed towards groundwater. There are also no activities within any default SPZ1 for PWSs. Activities in SPZ2 have also been limited along sections of the onshore cable corridor. C-137 provides a statement confirming what activities will be outside of the SPZs, which is projected onto **Figure 26.6, Volume 3** of the ES (Document Reference: 6.3.26) and taken into account in the baseline. Text is provided in the detailed baseline report (**Appendix 26.1: Detailed water environment baseline information, Volume 4** of the ES (Document Reference: 6.4.26.1)) and summarised in the main body of the baseline in **Section 26.6** of this chapter. A survey carried out by ADC on 22 June 2022 and 2 June 2023, has also helped improve the precision of source coordinates for several PWSs in closer proximity to the proposed DCO Order Limits.
WFD Assessment: **"*With regard onshore freshwater ecology, we have the following comments to make. Whilst the cable route has looked to limit the number of watercourse crossings, and the proposals for main rivers are for directional drilling below watercourses, there is still likely to be a high level of***	More information has been presented in **Appendix 26.3: Water Framework Directive compliance assessment, Volume 4** of the ES (Document Reference: 6.4.26.3)**, Section 26.7** and **Chapter 22: Terrestrial ecology and nature conservation, Volume 2** of the ES (Document Reference: 6.2.22) regarding the suite of embedded environmental measures (see **Table 26-20**) to minimise

Theme / Comment	How this is addressed in this ES and DCO Application
***disturbance to smaller watercourses in both the Arun and Adur catchment.*"** **"*Whilst the WFD status for many of these is "Moderate" or "Poor" and Rampion activities are unlikely to cause direct deterioration in status there is still the possibility of impacts to fish populations during the construction phase.*"** **"*Mention is made of potential impacts from mobilised sediments and pollutants with regard impact to fish and other aquatic species but no acknowledgement of the potential for physical impact caused by damming and de-watering of sections of watercourse and disturbance from temporary or permanent vehicle crossings. We would expect to see as many cable crossing to be below the bed of river wherever possible to reduce this. Permits will be required for each site given the variability of habitats and species present.*"**	the temporary sediment disturbance relating to open cut cabling crossings and culverted watercourse crossings. A collaborative approach has been carried out with the terrestrial ecology team to identify those smaller watercourses which require additional mitigation along the onshore cable corridor. A watercourse crossing assessment has been carried out as part of **Chapter 22: Terrestrial ecology and nature conservation, Volume 2** of the ES (Document Reference: 6.2.22) to identify potential fisheries along the onshore cable route. One watercourse crossing was identified as offering good coarse fishery habitat near Buncton adjacent to Water Lane. This was previously marked as an open cut trenched crossing in the original PEIR (RED, 2022) however this has been altered to a trenchless crossing to minimise effects from channel disturbance at this location. Several other smaller crossings were identified as modified Chalk streams by the SDNPA and an embedded environmental measure (C-229) in **Table 26-20** has been put in place for clear span bridges to minimise impacts at these locations. A suite of other embedded environmental measures have considered unintrusive ways to cross upstream of the spawning grounds (for example, at the Water Lane river) and limiting the period of disturbance during critical periods of spawning. This is captured within **Section 26.7** of this chapter (see **Table 26-20**).
There may be a requirement to restrict timings of works in particular locations with regard both spawning timings for coarse fish and salmonids.	As noted in **Chapter 22: Terrestrial ecology and nature conservation, Volume 2** of the ES (Document Reference: 6.2.22), only one crossing was identified as having favourable conditions

Theme / Comment	How this is addressed in this ES and DCO Application
	for fish spawning (near Buncton). This will be crossed by an unintrusive trenchless crossing methodology. Within the survey, fish were identified as unlikely to be resident along the other reaches of smaller watercourses along the onshore cable corridor. Embedded environmental measure C-64 will ensure isolation works are kept to as short a duration as possible, and screening will take place to prevent fish being drawn into the pump. Embedded environmental measure C-117 ensures that works will be programmed in early summer and autumn. Embedded environmental measures are outlined in **Table 26-20** within **Section 26.7**.
WFD Assessment: "*De-watering activity will require suitable screening of all pumps and the ability to rescue and recover any fish encountered. Any potential loss of habitat during the construction phase will require compensation in line with Government Net Gain Targets and there are a number of proposed or ongoing Environmental Projects in both the Arun & Adur Valleys for which mitigation for Rampion 2 could be directed toward*."	Embedded environmental measure C-64 will ensure that isolation works would be kept to as short a duration as possible, and screening will take place to prevent fish being drawn into the pump, as described in **Table 26-20**, within **Section 26.7** of this chapter. Information on any temporary habitat loss and biodiversity net gain are addressed within **Chapter 22: Terrestrial ecology and nature conservation, Volume 2** of the ES (Document Reference: 6.2.22) and **Appendix 22.15: Biodiversity Net Gain information, Volume 4** of the ES (Document Reference: 6.4.22.15) accordingly.
Flood Risk. FRAPS: "*Following the review of the PEIR we welcome the fact that the environmental permitting requirements have been identified in accordance with the Environmental Permitting (England and Wales) Regulations 2016*."	Noted, no further action required.
Environmental Permitting: *The Applicant will require an Environmental Permit for Flood Risk Activities for the*	Noted. This chapter acknowledges the need for these permits in **Section 26.7** as does the Flood Risk Assessment in

Theme / Comment	How this is addressed in this ES and DCO Application
construction phase of the work (a 'FRAP'). Further guidance can be found on the gov.uk website: https://www.gov.uk/guidance/flood-risk-activities-environmental-permits#exemptions. We advise that you consult us early to avoid delays to construction. We generally take two months to determine each application, but for a large scale Nationally Significant Infrastructure Project such as this, with multiple main river crossings and associated works, it may take longer to determine the applications.	**Appendix 26.2: Flood Risk Assessment, Volume 4** of the ES (Document Reference: 6.4.26.2). Engagement will continue during the post-DCO consent, detailed design stage for the preparation of Environmental Permit and FRAP applications. RED will commence that process in advance of construction works.
Environmental Permitting: ***"Any temporary work associated with permanent installation such as temporary bridge crossings, dewatering and working compounds in the flood plain are also likely to require an Environmental Permit for Flood Risk Activities. Temporary work should therefore be considered in the ES and / or standalone FRA to determine whether there will be a likely significant effect."***	Noted. This chapter (**Section 26.7**) and **Appendix 26.2: Flood Risk Assessment, Volume 2** of the ES (Document Reference: 6.4.26.2) acknowledge the need for these permits. Engagement will continue into the detailed design stages as part of the preparation of the Environmental Permit and FRAP applications. Both documents also consider all temporary construction activities that have potential for impact on the water environment including flood risk. Following implementation of embedded environmental measures set out in **Section 26.7** (see **Table 26-20**) it has been concluded that there will not be 'significant' effects.
Environmental Permitting: "*We will require further information regarding any temporary flood risk activities as part of any permit application. We therefore recommend that you engage with us regarding any temporary works design early in the process to ensure that a permit can be granted for the temporary works. Flood Risk Activity Permits are potentially capable of being disapplied in relation to Nationally Significant Infrastructure Projects under section 150 of the Planning Act 2008.*	Noted. This chapter (**Section 26.7**) and **Appendix 26.2: Flood Risk Assessment, Volume 2** of the ES (Document Reference: 6.4.26.2) acknowledge the need for these permits. Engagement will continue post-detailed design stages as part of the preparation of the Environmental Permit and FRAP applications.

Theme / Comment	How this is addressed in this ES and DCO Application
***However, this would be subject to obtaining our prior consent and application of agreed protective provisions*."**	
Environmental Permitting*: "The Environmental Permitting (England and Wales) Regulations 2016 require a permit to be obtained for any activities which will take place: on or within 8 metres of a main river (16 metres if tidal) / on or within 8 metres of a flood defence structure or culvert (16 metres if tidal) / on or within 16 metres of a sea defence / involving quarrying or excavation within 16 metres of any main river, flood defence (including a remote defence) or culvert / in a floodplain more than 8 metres from the river bank, culvert or flood defence structure (16 metres if it's a tidal main river) and you don't already have planning permission."*	Noted. These permitting requirements are captured within an embedded environmental measure (C-17) set out in **Table 26-20** within **Section 26.7** and **Appendix 26.2: Flood Risk Assessment, Volume 4** of the ES (Document Reference: 6.4.26.2).
WFD Assessment: "*We have reviewed the Water Framework Directive (WFD) assessment documentation supplied in the relevant technical appendix (vol 4 Chapter 26) in relation to the WFD water quality remit for TRaC waters*."	Agreement noted. No further action required.
WFD Assessment: "*We are pleased to note that we agree with the screening and scoping interpretations provided, and note that as regards chemical water quality further information will be provided within an impact assessment when chemical samples have been analysed. This is encouraging and gives us confidence that WFD water quality for the TRaC waters is being covered well*."	Noted. Results from sediment sampling within the marine environment have been incorporated as part of the WFD assessment in **Appendix 26.3: Water Framework Directive compliance assessment, Volume 4** of the ES (Document Reference: 6.4.26.3).
WFD Assessment: "*We would like to take the opportunity to point out that summary water body classifications were last issued formally in the 2015*	The latest interim classifications (2019) have been used to inform the WFD assessment in **Appendix 26.3: Water Framework Directive compliance**

Theme / Comment	How this is addressed in this ES and DCO Application
RBMP, (quoted in this document) and that whilst they remain officially the classification due to not having yet being formally updated we should point out that ALL TRaC waterbodies are now failing for chemistry. This information is published and in the public domain, in as much as the latest (referred to as the "2019") classification monitoring results are available online via Open Data, but it would not be obvious, without detailed scrutiny of the individual results and deep knowledge of the classification process, that all water bodies fail."	**assessment, Volume 4** of the ES (Document Reference: 6.4.26.3). It has also been noted in that assessment that all Transitional and Coastal (TraC) water bodies are currently failing to achieve good chemical status. The assessment has taken this into account (in terms of potential to 'fail worse').
WFD Assessment: **"*The applicant may wish to consult Environment Agency directly for summary chemistry classifications for the 2019 classification ahead of conducting the chemical water quality impact assessments they intend to provide for us anyway.*** ***The impact assessments should use available information on pre-existing chemical baselines in the waterbodies where impact assessment are carried out, and the 2019 classification exercise may provide more up to date baselines*."**	Latest water quality data available from the Environment' Agency's Catchment Data Explorer have been used to inform the assessment, based on the latest interim classifications (2019) in **Appendix 26.3: Water Framework Directive compliance assessment, Volume 4** of the ES (Document Reference: 6.4.26.3).
WFD Assessment: **"*The significance of the change is chemical status to "fail" for the applicant, is that if the water body is already failing in relation to priority or priority hazardous substances (for example) then no activity they could undertake is likely not to result in a situation where the waterbody still continues to fail*."** **"*In such a scenario, WFD compliance for water quality cannot be argued as activity in a water body which passes, and the activity doesn't cause a change***	Noted. **Appendix 26.3: Water Framework Directive compliance assessment, Volume 4** of the ES (Document Reference: 6.4.26.3) outlines that all TraC waterbodies are currently failing to achieve good chemical status and therefore any disturbance of sediments will effectively result in a 'fail worse' situation. The WFD Assessment in **Appendix 26.3: Water Framework Directive compliance assessment, Volume 4** of the ES (Document Reference: 6.4.26.3) concludes that the Proposed Development will not

Theme / Comment	How this is addressed in this ES and DCO Application
from PASS to FAIL, since the baseline will be failing, so the activity is not going to cause an improvement to a PASS. Therefore, the applicants WFD defence argument must be somewhat more subtle; that the activity will not cause a WFD deterioration of any water quality element(s). The applicant must therefore provide the rationale for the water body not "failing worse." ***We can provide some further guidance on how we would interpret the "fail worse" threshold, to assist the applicant in making their impact assessment arguments.***"	result in a 'fail worse' scenario for any WFD water body.
WFD Assessment: "*We positively welcome engagement on this prior to the issue of the WFD impact assessment which will consider concentrations in water resulting from disturbance of sediment which may contain either CEFAS list chemicals or Environmental Quality Standards Directive (EQSD) list chemicals they do not need to be discharged from the activity directly- they should still be considered if they are present in sediment being disturbed.* ***We note the applicant appeared to "scope out EQSD chemicals" arguing they were not going to be used- but we would advise that sediment chemical testing needs to include priority and hazardous substances (EQSD list substances) and that disturbance of waterbody sediments where they do contain these chemicals would need to be scoped In to impact assessments, even if then at the impact assessment stage it can be argued that the concentration changes are temporary, short term and will not contribute to a "fail worse" classification scenario for any failing chemical elements due to the***	The WFD assessment in **Appendix 26.3: Water Framework Directive compliance assessment, Volume 4** of the ES (Document Reference: 6.4.26.3) and its Annex B considers priority hazardous substances for a number of activities associated with the onshore cable corridor. In Annex B, it is acknowledged that there is potential for pollutants and sediments from various temporary construction activities, and these were scoped in for further assessment in Annex C. As such these chemicals also receive due consideration in relation to the onshore water environment.

Theme / Comment	How this is addressed in this ES and DCO Application
***changes being "insignificant" in amplitude*.** ***We are of course aware that in large water bodies the amplitude is probably going to be low as there probably will be high dilution, so we are looking for the applicant to qualify that by reasoned argument to make their case for WFD compliance transparent to the public*."**	
Landfall design: "*For the proposed Landfall works at Climping, the positioning of any above ground apparatus and haul road / construction compound would need to be chosen with extreme care. This is primarily due to situation regarding coastal erosion in close vicinity to the planned works. We would request that we are consulted regularly regarding this aspect and location as part of the wider works, including any final decisions*."	Noted. The Environment Agency has been consulted on positioning of the landfall with regards to coastal erosion, and this is addressed within **Appendix 26.2: Flood Risk Assessment, Volume 4** of the ES (Document Reference: 6.4.26.2) and considered further within **Chapter 6: Coastal processes, Volume 2** of the ES (Document Reference: 6.2.6). In **Section 26.7** an embedded environmental measure (C-247) has also been put forward for post-DCO ground investigation to inform the detailed design of the Transition Joint Bay (TJB) apparatus to further protect it against future coastal erosion and tidal flooding.
MSDC	
"*No significant effects have been identified in the PEIR but the Water Environment submissions and Flood Risk Assessment that will be compiled when the substation location is finalised to then form part of the DCO application will need to be fully assessed (by) Mid Sussex*."	Noted, no further action required. The onshore substation location is now outside of the jurisdiction of MSDC. Therefore, MSDC has deferred to HDC in relation to matters pertaining to onshore substation drainage, as noted in **Section 26.3**.
SDNPA	
"*As per our comment above in Terrestrial Ecology section, there is no mention of dew ponds on the Norfolk estate and other downland sites. Chalk springs may not be designated but are a very important unpolluted habitat and should be given higher status. Please*	In **Appendix 26.1: Detailed water environment baseline information, Volume 4** of the ES (Document Reference: 6.4.26.1), the baseline section includes relevant dew ponds and Chalk springs that were not included in the original PEIR (RED, 2022). SDNPA

Theme / Comment	How this is addressed in this ES and DCO Application
***ensure both are identified and protected*."**	provided a map which identifies several Chalk streams which are crossed by the onshore cable corridor. Embedded environmental measures (C-126 and C-229) set out in **Table 26-20** aim to minimise effects on these features including the combined use of open span haul road bridges, trenchless crossing techniques and seasonal working. These were presented and agreed with SDNPA and the Environment Agency at the ETG meeting in November 2022. Given that ponds and Chalk springs are undesignated the sensitivity criteria places them as 'low' value or sensitivity within the four tier spectrum of receptors (in **Table 26-21**). However, the assessment is structured so that permanent detectable impacts on these springs would be flagged up as being significant. Embedded environmental measures C-76, C-77, C-140, C-141, C-144 and C-229 ensure there would be no significant effects on these receptors within assessments in **Section 26.9** to **26.11**.
"*In terms of specific mitigation measures, if concrete is to be used as a base in watercourses then there should be a methodology for reinstatement of the natural bed after construction*."	In terms of onshore cable crossing methodologies, embedded environmental measure C-122 ensures that the cables will pass beneath the bed of the watercourse with sufficient depth resulting in no potential for exposure due to scour (**Section 26.7,** see **Table 26-20**). **Chapter 4: The Proposed Development, Volume 2** of the ES (Document Reference: 6.2.4) indicates that trenches will be backfilled with originally excavated material or cement bound sand (CBS) up to the protective tiles / tape then backfilled above that with excavated material >1m above cables. In terms of cable route watercourse crossings, pre-fabricated concrete duct protection blocks will be buried well below the base of watercourses (at a depth of

Theme / Comment	How this is addressed in this ES and DCO Application
	approximately 1m below the watercourse). This will enable in-channel works to be carried out more efficiently and minimise the level of direct disturbance. The onshore cable and associated concrete duct blocks will be left in-situ once the Proposed Development has been decommissioned. Embedded environmental measures are outlined in **Section 26.7** (see **Table 26-20**) of this chapter. This includes embedded environmental measures C-19, and C-229 which ensure that channels are to be reinstated in as short as practicable a timescale by carefully reinstating material that had been stripped and stored during construction.
WSCC	
2.44 "*There are a number of environmental sensitivities within the landfall area that have required due consideration; these include West Beach Local Nature Reserve (LNR), Climping Beach Site of Special Scientific Interest (SSSI), Littlehampton Golf Course and Atherington Beach Local Wildlife Site (LWS), the location in Flood Zone 3, and the presence of Environment Agency flood defences. RED have stated that, to reduce construction impacts, a trenchless solution is proposed to install ducts that would house the cables under Climping Beach. Although this approach is welcomed, there could still be indirect impacts on these sites that have not been assessed as part of the PEIR and that should be more transparently assessed in the ES*."	The FRA in **Appendix 26.2: Flood Risk Assessment, Volume 4** of the ES (Document Reference: 6.4.26.2) has further summarised the coastal change vulnerability assessment which is presented in detail within **Chapter 6: Coastal processes, Volume 2** of the ES (Document Reference: 6.2.6). These assessments have considered indirect effects along the coastal frontage and considered the resilience of the development and effects on shoreline processes. Further engagement has also taken place with the Environment Agency on the topic of flood risk management as described in **Section 26.3** of this chapter.
Appendix D on the Crossing Schedule: "*Based on the current mapping provided several water crossings have been missed i.e., Figure 4.2.1g 'Main Crossing on onshore cable corridor,'*	Additional watercourse crossings have been incorporated into the crossing schedule in **Appendix 4.1: Crossing schedule, Volume 4** of the ES (Document Reference: 6.4.4.1). As noted during a

Theme / Comment	How this is addressed in this ES and DCO Application
***between TRX-19 and TRX-20. Also Figure 4.2.1h, to the east of RDX-13. Clearly not all water crossings will be picked up from the OS mapping, but it would be expected that all will be picked up during subsequent site walk overs. WSCC expects this to be fully detailed in the ES.*"**	stakeholder meeting further walkovers would be carried out by an Ecological Clerks of Works (ECoW) and the appointed Contractor following the grant of development consent, to identify ditches prior to any construction works.
(In relation to paragraph 27.9.7) "*This section suggests 'two parallel separate trenches' will be excavated and backfilled to install the cable circuit, yet the worst case scenario is 'up to four'. Clarification is needed on what assumptions have been used in the assessment."*	The text in the assessment of potential effects for the Construction phase of the Proposed Development (in **Section 26.9**) has now been updated to acknowledge that there could be up to four separate trenches excavated and backfilled to install cable circuits. This represents a worst-case scenario in terms of potential for ground disturbance and associated effects on water quality and hydromorphology.
(With regards to paragraph 27.9.12) "*Has piling been considered and assessed as a worst case*?"	Piling has been considered as a worst case for groundwater receptors in the onshore substation assessment **Sections 26.9** to **26.11**. This has been made clearer in the maximum design scenario section of **Section 26.7**.

26.3.44 Following feedback to the first Statutory Consultation Exercise in 2021 and after further analysis, it was identified that some coastal residents did not receive consultation leaflets as intended. Therefore, the first Statutory Consultation was reopened between 7 February 2022 to 11 April 2022 for a further nine weeks. No feedback or comments were received from the reopened first Statutory Consultation in relation to water environment.

Second Statutory Consultation Exercise – October to November 2022

26.3.45 The second Statutory Consultation Exercise was undertaken from 18 October 2022 to 29 November 2022. This was a targeted consultation which focused on updates to the onshore cable route proposals which were being considered following feedback from consultation and further engineering and environmental works. As part of this second Statutory Consultation Exercise, RED sought feedback on the potential changes to the onshore cable route proposals to inform the onshore design taken forward to the application for development consent.

26.3.46 **Table 26-8** provides a summary of the key themes of the feedback received in the second Statutory Consultation Exercise in 2022 relation to water environment and outlines how the feedback has been considered in this ES chapter. A full list of all

comments received during the second Statutory Consultation Exercise in 2022 and the responses to those comments are provided in the **Consultation Report** (Document Reference: 5.1).

Table 26-8 Second statutory consultation exercise (October – November 2022) feedback

Theme / Comment	How this is addressed in this ES and DCO Application
Environment Agency	
Flood Risk: ***"We support the general approach made to updates to the Flood Risk Screening Assessment. We support the inclusion of a coastal change vulnerability assessment and the approach to fluvial floodplain considerations."***	This general comment is welcomed regarding the agreement on the approach taken on flood risk assessment and the inclusion of the coastal change vulnerability assessment. The FRA in **Appendix 26.2: Flood Risk Assessment, Volume 4** of the ES (Document Reference: 6.4.26.2) has further summarised the coastal change vulnerability assessment which is presented in detail within **Chapter 6: Coastal processes, Volume 2** of the ES (Document Reference: 6.2.6).
"Works near flood defences FRAP: any works within 16 metres from the landward toe of the sea defences would potentially need a FRAP under the Environment Permitting Regulations 2016. Similarly, if the works are within the Arun Internal Drainage District, for any works in under or over a watercourse a formal Flood Defence consent under the 1991 Land Drainage Act and/or byelaws would need to be forthcoming."	Noted. Further engagement with the Environment Agency will be facilitated with respect to the proposed approach to permitting following the DCO Application submission.
Groundworks in SPZ1: ***"In relation to modifications to the potential route at LACR-01 and LACR-02 and MR-04, we welcome the confirmation that no ground disturbance / groundworks will take place within the SPZ1. The only activities in SPZ1 will be use of access track and "stringing out" of HDD crossings only."***	Noted. It can be confirmed that there will be no groundworks in SPZ1 associated with the onshore cable construction corridor as part of the Proposed Development in the DCO Application. With respect to the minor upgrade works for access tracks associated with the Michelgrove Lane temporary construction and operational access route (A-26) within Patching SPZ1 two embedded environmental measures have been put

Theme / Comment	How this is addressed in this ES and DCO Application
	forward in **Section 26.7** (C-250 and C-251) in order to ensure that there will be no potential effects associated with these proposals.
"We would also support a watching brief for solution features, pre - construction Ground Investigation to identify sensitive areas and ground conditions and avoidance of features (swelling clays, transition zones, preferential pathways for breakouts)."	Noted. An environmental measure (C-246) has been embedded in **Section 26.7** to ensure that the 'watching brief' is carried out post DCO Application and prior to construction to identify sensitive areas and ground conditions within a key target area between Hammerpot and the Buckmans.
Poling Parish Council	
Surface Water Drainage: ***"The surface water drainage contained within the fabric of Poling Street is fragile and failing with a number of sections already fractured and pipes blocked. Detailed closed circuit television surveys are available to prove this. We are currently working with the County Council as the Highways Authority on remedial measures so bearing in mind that these pipes cover almost the entire length of the Street, we would be seeking some actions from them to ensure that a detailed precondition survey was undertaken and agreement given by yourselves to make good any damage."***	There is one proposed open cut trenched temporary crossing of Poling Street associated with the cable route. **Appendix 26.2: Flood Risk Assessment, Volume 4** of the ES (Document Reference: 6.4.26.2) and **Section 26.7** includes the provision of embedded environmental measures to ensure that there will be no damage to drainage. Embedded environmental measure C-28 addresses such circumstances for open cut temporary crossings along the onshore cable route.
Surface Water Flooding: ***"the village has, in the last few decades, been prone to some severe surface water flooding and many residents are concerned that works could make this worse so we would be looking for some guarantees that this will not be the case."***	**Appendix 26.2: Flood Risk Assessment, Volume 4** of the ES (Document Reference: 6.4.26.2) concludes that there will be no adverse effects on flood risk receptors along the onshore cable route (including the villages of Hammerpot and Poling). Embedded environmental measures (C-27, C-73, C-74, C-75 and C-134), presented in **Section 26.7** are included in **Table 26-20**.

Theme / Comment	How this is addressed in this ES and DCO Application
Drainage: ***"the whole landscape in and around the village is criss-crossed with streams, ditches and main river each of these are interlinked and blockages cannot, because of the slack gradient, be tolerated. Similarly ensuring that the spoil and haul roads do not cause problems with overland flows we would be seeking that anyway in the coastal plain that you are working such that these open watercourses are maintained in good order in and around your works."***	A wide range of environmental measures have been embedded into the Proposed Development to minimise the potential for changes in watercourse conveyance from blockages or the mobilisation of silt laden runoff entering the watercourses. Environmental measures include C-28, C-73, C-130, C-133, C-135 and C-176 (see **Section 26.7**). This chapter concludes that, following implementation of these embedded environmental measures, there will be no significant adverse effects towards potential receptors (**Section 26.9** to **26.12**).

Third Statutory Consultation Exercise – February - March 2023

26.3.47 The third Statutory Consultation Exercise was undertaken from 24 February until 27 March 2023. This was a targeted consultation which focused on updates to the onshore cable route proposals which were being considered following feedback from consultation and further engineering and environmental works. As part of this third Statutory Consultation Exercise, RED sought feedback on the potential changes to the onshore cable route proposals to inform the onshore design taken forward to the application for development consent.

26.3.48 **Table 26-9** provides a summary of the key themes of the feedback received in the third Statutory Consultation Exercise in 2022 relation to water environment and outlines how the feedback has been considered in this ES chapter. A full list of all comments received during the third Statutory Consultation Exercise in 2022 and the responses to those comments are provided in the Consultation Report.

Table 26-9 Third statutory consultation exercise (February – March 2023) feedback

Theme / Comment	How this is addressed in this ES and DCO Application
Environment Agency	
Flood Risk: ***"As far as practically possible, we recommend avoiding the use of temporary culvert crossings. We would support the use of existing access points or using temporary bridges as an alternative."***	A suite of embedded environmental measures (C-5, C-126, C-127, C-145 C-176, C-177 and C-229) are included to minimise the number of temporary culvert crossings (see **Section 26.7**).

Theme / Comment	How this is addressed in this ES and DCO Application
Flood Risk: ***"Any stockpiles should be ideally situated outside of Flood Zones 2 and 3. If they are proposed in the floodplain, we recommend the floodplain remains connected to minimise any impacts on flow conveyance. The location of stockpiles will need to be agreed."***	The proposed approach to soil stockpile management is that discussed with the Environment Agency at a targeted stakeholder meeting on 10 March 2022 (see **paragraph 26.3.29**). There will be no soil stockpiling in the floodplain associated with the haul road. The only potential soil storage in the River Arun floodplain will be limited in extent and short term in duration (reinstated within a matter of days) associated with localised open cut trenching. A suite of embedded environmental measures are included in **Section 26.7** (C-130, C-131, C-132 and C-133) to ensure floodplains remains connected.
"Consideration for pre-construction and post-construction asset condition surveys will be required. This will be relevant to any construction activities in close proximity to Main Rivers and subsequent assets."	Environmental measures (C-17, C-77, C-126, C-142 and C-182) are included to ensure adherence to the permitting regime (see **Section 26.7**) which will cover any temporary construction activities in close proximity to Main Rivers and subsequent assets.
"We would recommend further consideration regarding disapplication of consents for both FRAPs and Flood Defence Consents (FDC) going forward and will be happy to discuss this option in the future."	Noted, further engagement with the Environment Agency will be facilitated with respect to the proposed approach to permitting following the DCO Application submission.
Groundwater: ***"Clarification should be made on the operations proposed in any area that impinges on the SPZ1 for Patching Hill, if any."***	There will be a construction and operational access route along Michelgrove Lane (A-26). There are proposals for minor road upgrades associated with passing places in several locations within Patching SPZ1. This was raised during a targeted stakeholder meeting with the Environment Agency and Southern Water on 6 March 2023. Following this meeting, specific embedded environmental measures have been included (C-250 and C-251) in **Section 26.7** in order to minimise any risks posed towards water supplies in the Patching Hill area.

Theme / Comment	How this is addressed in this ES and DCO Application
Groundwater: ***"There are no licenced abstraction marked within the proposed new potential route area. There are also not any licenced or closed landfills marked within the footprint of the proposed new potential route area."***	Noted. No further action required.
"There may be private water supplies within the proposed new area. There may also be potential sources of contamination, such as industrial site. There should be appropriate assessments / surveys for these undertaken if utilising this extension area is pursued."	Assessments in relation to PWSs have been carried out in **Appendix 26.1: Detailed water environment baseline information, Volume 4** of the ES (Document Reference: 6.4.26.1) and **Appendix 26.4: Hydrogeological Risk Assessment, Volume 4** of the ES (Document Reference: 6.4.26.4) and summarised in **Section 26.9** to **26.11** of this chapter. This includes up-to-date baseline information and the provision of specific embedded environmental measures (C-78 and C-253) in order to minimise the potential for effects on PWSs from the Proposed Development. **Appendix 24.1: Phase 1 geo-environmental desk study, Volume 4** of the ES (Document Reference: 6.4.24.1) includes a geo-environmental desk study which investigates potential sources of contamination along the onshore cable route, however the study concludes that a section of the proposed DCO Order Limits is nearby historical Swillage Lane Landfill and Long Furlong landfill but that the overall likelihood of contamination is unlikely to low likelihood.

Fourth Statutory Consultation exercise – April to May 2023

26.3.49 The fourth Statutory Consultation exercise was undertaken from 28 April 2023 to 30 May 2023. This was a targeted consultation which focused on the proposed extension works to the existing National Grid Bolney substation to facilitate the connection of the Rampion 2 onshore cable route into the national grid electricity infrastructure. As part of this fourth Statutory Consultation exercise, RED sought feedback on the proposed substation extension works to inform the onshore design taken forward to the DCO Application.

26.3.50 The Environment Agency stated that they had no objection to the proposal and that they had no further comments to make on the fourth consultation.

26.3.51 A full list of all comments received during the fourth Statutory Consultation exercise in 2023 and the responses to those comments is provided in the **Consultation Report** (Document Reference: 5.1).

26.4 Scope of the assessment

Overview

26.4.1 This section sets out the scope of the ES assessment for water environment. This scope has been developed as the design of the Proposed Development has evolved and responds to feedback received to date as set out in **Section 26.3**.

Spatial scope and study area

26.4.2 The Study Area for the water environment assessment is shown on **Figure 26.1, Volume 3** of the ES (Document Reference: 6.3.26) and is defined as follows:

- the WFD surface water bodies (river and transitional) which are intersected by, and are downstream of, the proposed DCO Order Limits; and
- the WFD groundwater bodies which the proposed DCO Order Limits intersects.

26.4.3 The Study Area for the water environment is different to the onshore part of the proposed DCO Order Limits, which is defined as the area within which the Proposed Development will be located, including the temporary construction work areas. The proposed DCO Order Limits comprises an onshore cable corridor which allows flexibility in the positioning of a 40m onshore temporary construction corridor within it. Both the Study Area and onshore part of the proposed DCO Order Limits are used where appropriate for providing spatial context throughout this chapter.

26.4.4 Given that the onshore part of the proposed DCO Order Limits is extensive in size, the water environment baseline assessment in **Section 26.6** is described in the following way:

- Southern section: Onshore landfall, and onshore cable corridor towards Hammerpot;
- Central section: Onshore cable corridor from Hammerpot to Washington, West Sussex; and
- North-eastern section: The remainder of the onshore cable corridor from Washington, West Sussex towards Bolney, and the onshore substation site at Oakendene.

Temporal scope

26.4.5 The temporal scope of the assessment of the water environment is consistent with the period over which the Proposed Development would be carried out and therefore covers the construction, operation and maintenance and

decommissioning phases as set out in **Chapter 4: The Proposed Development, Volume 2** of the ES (Document Reference: 6.2.4). In summary:

- the maximum total onshore construction duration is anticipated to take approximately four years;
- the operational lifetime of the Proposed Development is expected to be around 30 years; and
- the timing of the decommissioning is itself more uncertain, but it is assumed that decommissioning works will take up to four years.

Potential receptors

26.4.6 The spatial and temporal scope of the assessment enables the identification of receptors which may experience a change as a result of the Proposed Development. The receptors identified that may experience likely significant effects for the water environment are outlined in **Table 26-10**.

Table 26-10 Receptors requiring assessment for water environment

Receptor group	Receptors included within the proposed DCO Order Limits
WFD Water Bodies	WFD Groundwater Bodies
	Littlehampton Anticline East GB40701G503400
	Littlehampton Anticline West GB40701G504900
	Sussex Lambeth Group GB40701G505100
	Worthing Chalk GB40701G505300
	Lower Greensand Adur and Ouse GB40701G502400
	Adur and Ouse Hastings Beds GB40702G502000
	WFD Surface Water Bodies
	Ryebank Rife GB107041006620
	Black Ditch (West Sussex) GB107041012890
	Honeybridge Stream GB107041012120
	Adur Lockbridge GB107041012200
	Adur East (Sakeham) GB107041012900
	Adur East, GB107041012180
	Cowfold Stream GB107041012260
	Arun Lower GB540704105000
	Adur GB540704116000

Receptor group	Receptors included within the proposed DCO Order Limits
	Sussex GB640704540003
Conservation Sites	Designated Conservation Sites Amberly Mount to Sullington Hill SSSI Non-statutory designated sites with potential for water dependency Bines Green LWS Local Geological Sites Rock Common Sand Quarry, Washington, West Sussex
Springs	Undesignated springs near Hammerpot (Black Ditch catchment); between Kithurst Farm and Garston Farm (River Stor catchment); Water Lane, Buncton, Castle Farm Estate and Hawking Soppers (Honeybridge Stream catchment)
Chalk Streams	Chalk stream headwaters of the black ditch south of the A27 Chalk streams near Buncton
SDNPA Dew Ponds and other ponds	Garden pond at Angmering Park Stud Farm (National Grid Reference (NGR): TQ 067043) (DP1) Dew pond north-east of Michelgrove Park (NGR: TQ 082082) (DP3) Dew pond to the south of Long Furlong Farm (NGR: TQ 095081) (DP4) Dew pond east of Harrow Hill (NGR TQ 086097) (DP5) Dew pond located between Harrow Hill and Myrtle Grove Farm (NGR TQ 087092) (DP6) Dew pond at Hill Barn, Warningcamp (NGR: TQ 048075) (DP9) Dew pond at The Huntsman's Cottage, west of Findon (NGR: TQ 113090) (DP10) Garden pond at Myrtle Grove Farm (NGR: TQ 090084) (DP14) Two dew ponds located to the south of Tolmare Farm (NGR: TQ 109088 & TQ 108087) (DP15 & DP16) Dew pond located between Blackpatch Covert and Coventry Plantation (NGR: TQ 107095) (DP17)

Receptor group	Receptors included within the proposed DCO Order Limits
	Farmyard pond south of Cobden Farm (NGR: TQ 100108) (DP18)
	Dew pond north of Cobden Farm (NGR: TQ 100109) (DP19)
	Dew pond to the north of Cobden Farm (NGR: TQ 101112) (DP20)
Water Resources	<u>Public Water Supply Abstractions</u>
	A15 24/063 Warningcamp Borehole
	A20 10/41/310210 Angmering PS Point 2
	A21 10/41/310210 Angmering PS Point 1
	A28 10/41/310210 Patching PS
	A31 10/41/310210 Stanhope Lodge PS
	A33 10/41/310210 Findon PS
	A35 10/41/310210 Sompting PS
	A36 10/41/310210 Broadwater PS Borehole 1
	A37 10/41/310210 Broadwater PS Borehole 2
	A38 10/41/310210 Broadwater PS Borehole 3
	A39 10/41/310210 Broadwater PS Well
	A40 10/41/310210 Northbrook PS Point 2 (Sussex)
	A41 10/41/310210 Northbrook PS Point 1 (Sussex)
	A73 10/41/310210 Clapham Point 2
	A74 10/41/310210 Clapham Point 1
	<u>Large Licensed Abstractions, and / or where water quality is more critical</u>
	A1 10/41/542009 Point A At New Barn, Climping
	A5 23/059 Point A St Alders Fish Farm
	A6 10/41/411021 River Arun – Estuary Tidal
	A9 24/060 Knucker Hole Fish Farm
	A19 10/41/414101 Lee Farm, Patching
	A20 10/41/310210 Angmering PS Point 2
	A21 Angmering PS Point 1

Receptor group	Receptors included within the proposed DCO Order Limits
	A23 Old Place Farm
	A24 24/066 Old Place Farm
	A27 24/068/R01 Side Channel Of The Black Ditch at Manor Farm, Poling
	A45 23/051 Daylands Farm
	A46 10/41/312103 Wappingthorn Farm, Steyning Borehole A
	A47 10/41/312010 Huddlestone Farm, Steyning
	A48 10/41/312010 Huddlestone Farm, Steyning
	Small Licensed Abstractions and / or where water quality is less critical
	A23 24/066 Old Place Farm
	A42 25/084 Point A, Sandgate Pit, Storrington
	A43 25/084 Point B, Sandgate Pit, Storrington
	A44 23/073 Washington Garden Centre
	PWSs
	P1 The Old Rectory
	P2 Brookbarn House
	P3 Pauls House
	P4 The Decoy
	P5 Suzy Smith Racing / Angmering Park Estate
	P10 The Chantry Mere
	P11 Wappingthorn Farm
	P12 Huddlestone Farm
	P18 Unknown
	P19 East Cottage
	P20 Green Pastures
	P21 Myrtlegrove Cottage Stables
	P22 The Martins
	P24 Michel Grove

Receptor group	Receptors included within the proposed DCO Order Limits
	Consented Discharges D1 Discharge on the north bank of the River Arun for H M Prison (P06977); D2 Bolney Substation at Wineham Lane (S01525); D3 Old Doctors Cottage (N02970); D4 Sub-Station at Wineham Lane (S01446)
Flood Risk Receptors	
	Essential Infrastructure Arundel Station
	Highly Vulnerable Land Use Brookside caravan park
	More Vulnerable Land Use Residential properties within Atherington; The Mill, Climping Residential and mixed-use properties on Church Lane, Lyminster Mixed-use properties on Sandhill Lane, Washington, and Springlands, Wineham
	Less Vulnerable Land Use Climping Park, Priory Farm, Old Waterworks Farm, Rock Business Park, Washington, and Yokenclose Barn, Bines Green

Potential effects

26.4.7 Potential effects on water environment receptors that have been scoped in for assessment are summarised in **Table 26-11**.

Table 26-11 Potential effects on water environment receptors scoped in for further assessment

Receptor	Activity or impact	Potential effect
Construction phase		
Groundwater and Surface WFD Water Bodies (River, Transitional and Coastal)	Spillage or leakage of fuels, lubricants or other chemicals during construction at the landfall, cable laydown and onshore substation. This includes	Potential for accidental contamination entering watercourses or groundwater.

Receptor	Activity or impact	Potential effect
	the potential for breakout and leakage of bentonite during trenchless crossing.	
Groundwater WFD Water Bodies	Dewatering of the trenched excavations for cabling and the onshore substation, for piling if it is required for the installation of sub-surface substation foundations, or the development of less permeable access track / temporary construction compound establishment reducing infiltration.	A decline in groundwater levels.
Surface WFD Water Bodies (River, Transitional and Coastal)	Ground disturbance and mobilisation of sediments / contaminants during construction at the landfall, cable laydown and onshore substation.	Silt laden or otherwise contaminated runoff entering watercourses and / or intertidal areas.
	Works in or near watercourses (for example, installation of landfall cable, watercourse crossings and associated earthworks).	Changes to watercourse morphology.
Conservation Sites, Ponds, Springs, and Chalk Streams	Dewatering of the trenched excavations for cabling, ground disturbance for the development of temporary access track establishment, or the leakage / spillage of fuels and chemicals onsite.	Reduction of water availability to support existing groundwater or surface water designated or undesignated sites, ecosystems and features.
Water Resources (Licensed Abstractions, PWSs and Unregistered Mapped Wells)	Dewatering of the landfall, cable laydown and onshore substation excavations for cabling and substation foundations, ground disturbance for the development of temporary access track / temporary construction compound establishment, or the leakage / spillage of fuels	Reduction of water availability to support existing surface water and groundwater abstractions as a consequence of water quantity and/or quality effects.

Receptor	Activity or impact	Potential effect
	and chemicals onsite. This includes the potential for breakout and leakage of bentonite during trenchless crossing.	
Water Resources (Consented Discharges)	Landfall, cable and onshore substation trenching and temporary access track / temporary construction compound establishment.	Physical disruption to existing discharge infrastructure (for example, septic tank soakaways or discharge outfalls).
Flood Risk Receptors (Residential Properties)	Construction during landfall, cable laydown and onshore substation construction of temporary stockpiles and raised access tracks within floodplain areas.	Volumetric displacement of flood water.
	Ground disturbance and the development of temporary access tracks and temporary construction compound areas during landfall, cable laydown and onshore substation construction.	Changes in runoff rates and new flow pathways.
	Dewatering of landfall, cable laydown and onshore substation excavations.	Increases in flow in watercourses.
	Temporary watercourse crossings.	Changes in watercourse conveyance.
Operation and maintenance phase		
Groundwater and Surface Water WFD Water Bodies (River, Transitional and Coastal)	Isolated cable repairs or the leakage / spillage of fuels and chemicals from vehicles onsite or during occasional maintenance visits to the onshore substation.	Potential for accidental contamination entering groundwater or watercourses.
Groundwater WFD Water Body	The presence of a below ground grid, onshore substation support	A reduction in groundwater levels.

Receptor	Activity or impact	Potential effect
	structures and impermeable surfaces.	
Surface Water WFD Water Bodies (River and Transitional)	The permanent presence of erosion protection around cable crossings.	Exacerbation of downstream or upstream bank and bed erosion and sediment deposition leading to changes to watercourse morphology.
Conservation Sites, Ponds, Springs and Chalk Streams	Isolated repairs, and the leakage / spillage of fuels and chemicals from vehicles onsite or from diversion of sub-surface land drainage flow pathways due to the permanent presence of limited below ground concrete-lined joint bays and backfilled material around cable circuits.	Reduction of water availability to support existing groundwater or surface water designated or undesignated sites, ecosystems and features as a consequence of quantity / quality effects.
Water Resources (Licensed Abstractions, PWSs and Unregistered Mapped Wells)	Isolated repairs, and the leakage / spillage of fuels and chemicals from vehicles onsite or during occasional maintenance visits to the onshore substation, or from diversion of sub-surface land drainage flow pathways due to the permanent presence of limited below ground concrete lined joint bays, backfilled material around cable circuits and below ground grid, onshore substation support structures and impermeable surfaces.	Reduction of water availability to support existing surface water and groundwater abstractions as a consequence of quantity / quality effects.
Flood Risk Receptors	Maintenance works in floodplains during isolated repairs of the landfall TJB or cable circuits.	Volumetric displacement of flood water.

Receptor	Activity or impact	Potential effect
	Ground disturbance during isolated repairs of landfall TJB or cable circuits or associated with the impermeable onshore substation footprint.	Changes in runoff rates and new flow pathways.
Decommissioning phase		
Groundwater and Surface Water WFD Water Bodies (River, Transitional and Coastal)	Isolated decommissioning works and the leakage / spillage of fuels and chemicals from vehicles onsite.	Potential for accidental contamination entering groundwater or watercourses.
Surface Water WFD Water Bodies (River and Transitional)	The permanent presence of erosion protection around cable crossings.	Exacerbation of downstream or upstream bank and bed erosion and sediment deposition leading to changes to watercourse morphology.
Conservation Sites, Ponds, Springs and Chalk Streams	Isolated decommissioning works, and the leakage / spillage of fuels and chemicals from vehicles onsite or from diversion of sub-surface land drainage flow pathways due to the permanent presence of limited below ground concrete-lined TJBs and backfilled material around cable circuits.	Reduction of water availability to support existing groundwater or surface water designated or undesignated sites, ecosystems and features as a consequence of water quantity / quality effects.
Water Resources (Licensed Abstractions, PWSs and Unregistered Mapped Wells)	Isolated decommissioning works, and the leakage / spillage of fuels and chemicals from vehicles onsite or from diversion of sub-surface land drainage flow pathways due to the permanent presence of limited below ground concrete-lined TJBs and backfilled material around cable circuits.	Reduction of water availability to support existing surface water and groundwater abstractions as a consequence of water quality and / or quantity effects.

Receptor	Activity or impact	Potential effect
Water Resources (Consented Discharges)	Temporary access track / temporary construction compound establishment.	Physical disruption to existing discharge infrastructure (for example, septic tank soakaways or discharge outfalls).
Flood Risk Receptors	Maintenance works in floodplains during decommissioning of the landfall TJB or cable circuits.	Volumetric displacement of flood water.
	Ground disturbance during decommissioning of the landfall TJB and the cable circuits.	Changes in runoff rates and new flow pathways.

Activities or impacts scoped out of assessment

26.4.8 A number of potential effects have been scoped out from further assessment, resulting from a conclusion of no potential significant effect. These conclusions have been made based on the knowledge of the baseline environment, the nature of planned works and the wealth of evidence on the potential for impact from such projects more widely. The conclusions follow (in a site-based context) existing best practice. Each scoped out activity or impact is considered in turn in **Table 26-12**.

Table 26-12 Activities or impacts scoped out of assessment

Activity or impact	Rationale for scoping out
Landfall – cable and associated earthworks resulting in potential impacts on groundwater levels	Subsurface works will be limited to the coastal area and the local water table will be connected to the sea levels, therefore no impact on freshwater groundwater levels is anticipated. The Planning Inspectorate has agreed with this approach (Planning Inspectorate, 2020) (**Table 26-5**). No stakeholders have commented on the issue.
Operation and maintenance activities resulting in a potential impact on groundwater levels	Operation and maintenance activities will not involve dewatering works and therefore no impact on groundwater levels is anticipated. The Planning Inspectorate has agreed with this approach (Planning Inspectorate, 2020 (**Table**

Activity or impact	Rationale for scoping out
	26-5). No stakeholders have commented on the issue.
Decommissioning activities resulting in a potential impact on groundwater levels	Sub-surface infrastructure will be left in place in the decommissioning phase and there will be no dewatering works and therefore no impacts on groundwater levels are anticipated. The Planning Inspectorate has agreed with this approach (Planning Inspectorate, 2020) (**Table 26-5**). No stakeholders have commented on the issue.

26.5 Methodology for baseline data gathering

Overview

26.5.1 Baseline data collection has been undertaken to obtain information over the Study Area described in **Section 26.4: Scope of the assessment**. The current baseline conditions presented in **Section 26.6: Baseline conditions** are based on data available at the time of writing for the Study Area. Data gathering has been carried out via a desk study and site walkover surveys which are briefly described in the following sections.

Desk study

26.5.2 The data sources that have been used to inform this water environment assessment are summarised in **Table 26-13**.

Table 26-13 Data sources used to inform the water environment ES assessment

Topic	Source of information and summary of data	Coverage of the Study Area	Date(s) accessed
Topography	Online maps and aerial photography, at: https://gridreferencefinder.com/ https://www.bing.com/maps Ordnance Survey (OS) OS topographic maps, 1:25,000 and 1:50,000 scale, also locator at: https://gridreferencefinder.com/ 1:10,000 OS raster data.	Full coverage of the Study Area	26/05/2023

Topic	Source of information and summary of data	Coverage of the Study Area	Date(s) accessed
	5 m Digital Terrain Model (DTM) data.		
Climate	Environment Agency, average daily rainfall totals recorded at Arundel and Storrington Environment Agency Climate Stations between 01/01/2009 and 31/12/2019. Meteorological Office (Met. Office), annual rainfall averages for the Bognor Regis and Shoreham Airport Climate Stations for the period 1981-2010, at: https://www.metoffice.gov.uk/	Full coverage of the Study Area	26/05/2023
Surface Water Hydrology	Environment Agency, gauged maximum daily tidal level data for tidal River Arun at Littlehampton, and maximum daily river flow data for River Adur at Sakeham (East branch). Flow record obtained for 1991 – 2020, and graphs for the 2019 annual period have been presented. National River Flow Archive (NRFA), summary river flow statistics for Environment Agency flow gauges online at: http://www.ceh.ac.uk/data/nrfa/data/search.html These are presented for flow gauges at Hardham Rother Arun, Pallingham Arun, Sakeham Adur (East Branch) Hatterell Bridge Adur (West Branch) and Chess Bridge.	Covers the two Main Rivers within the Study Area	26/05/2023
Geology, Hydrogeology, and Soils	British Geological Survey (BGS), geological mapping and observation borehole data from the BGS Geology of Britain Viewer, the BGS Onshore GeoIndex, BGS Memoirs and the 1:625,000 scale Hydrogeological Map of England and Wales.	Full coverage of the Study Area	26/05/2023

Topic	Source of information and summary of data	Coverage of the Study Area	Date(s) accessed
	BGS (2022a) Geology of Britain Viewer, at: http://mapapps.bgs.ac.uk/geologyofbritain/home.html BGS Onshore GeoIndex (2022b), at: http://mapapps2.bgs.ac.uk/geoindex/home.html BGS Major and Minor Aquifer Properties Manuals (Allen et al 1997 and Jones et al., 2000 respectively). Information from publications obtained for hydrogeological properties including storage coefficients and transmissivity values for relevant Principal and Secondary aquifers. Hydrogeological mapping, at: https://largeimages.bgs.ac.uk/iip/mapsportal.html?id=1003976 Location of water wells and borehole and geological logs. Cranfield University Land Information System (Cranfield University, 2020) soil types, at: http://www.landis.org.uk/soilscapes/		
Designated Conservation Sites and Non-statutory Conservation Sites	Defra, interactive maps from the Multi-Agency Geographic Information for the Countryside (MAGIC) (Defra, 2023) natural environment map viewer, at: http://www.magic.gov.uk/ Includes aquifer designations and statutory and non-statutory designated nature conservation sites. Natural England, conservation sites and SSSI citations and information online, at: https://designatedsites.naturalengland.org.uk/	Full coverage of the Study Area	26/05/2023

Topic	Source of information and summary of data	Coverage of the Study Area	Date(s) accessed
	Information on Chalk streams and ponds from SDNPA (received 27-28 October 2021).		
WFD Water Bodies	Environment Agency, WFD water body status, Nitrate Vulnerable Zones (NVZs) within the RBMP (2019 cycle 2) information, via the Environment Agency Catchment Data Explorer (Environment Agency, 2021b), at: http://environment.data.gov.uk/catchment-planning/	Full coverage of the Study Area	26/05/2023
Water Resources	Environment Agency, water resource data including licensed abstractions and consented discharges. ADC, HDC, Adur and Worthing District Council (AWDC) and MSDC registered PWS records comprising coordinates and summary of their uses. ADC also carried out a follow-up investigation to confirm coordinates of Brookbarn Farm and Lample House PWS records on 22 June 2022 and the Decoy and Angmering Park Study Farm / Suzy Smith Riding / Angmering Estate on 2 May 2023. Environment Agency, summary of water availability the Arun and Western Streams Abstraction Licensing Strategy (March 2019) and The Adur and Ouse Catchment Abstraction Management Strategy (March 2005). SPZ data from the MAGIC map (Defra, 2023) natural environment map viewer, at: http://www.magic.gov.uk/ Information obtained from Southern Water on groundwater borehole levels and geophysical logs recorded at the Warningcamp, Angmering and Patching	Full coverage of the Study Area	26/05/2023

Topic	Source of information and summary of data	Coverage of the Study Area	Date(s) accessed
	public water supplies received on 23 December 2021. Information on potential karst features from Southern Water in the Warningcamp, Angmering and Patching areas received on 5 May 2022.		
Flood Risk	Environment Agency, Flood Map for Planning map (Environment Agency, 2021c), at: https://flood-map-for-planning.service.gov.uk/ Environment Agency, River Arun to Pagham Flood and Coastal Erosion Risk Management Strategy Appraisal Report. Open Government, Fluvial Flood Zones and Risk of Surface Water Flooding Extents mapped on Open Government Data Online at: https://data.gov.uk/ ADC (2016), HDC (2010) and MSDC (2015), SFRAs presenting baseline information on all flood risk sources including groundwater and sewer flooding. Each document references findings from the Environment Agency's Areas Susceptible to Groundwater Flooding (AStGWF) dataset.	Full coverage of the Study Area	26/05/2023

Site surveys

26.5.3 Site walkovers were carried out, and further information on the scope and coverage of the walkovers is provided in **Table 26-14**.

Table 26-14 Site surveys undertaken

Survey type	Scope of survey	Coverage of Study Area
Water environment walkover survey, 2 and 3 August 2021. **Relevant site photographs are presented in Appendix 26.1.**	The purpose of the walkover survey was to validate the key findings of the desk study and further inform the baseline assessment in the ES.	The walkover survey covered pertinent points of interest along the onshore cable corridor including the following: • the existing sea defence in front of the proposed landfall; • proposed crossings of the River Arun and Adur channels and their Main River tributaries (Ryebank Rife, Black Ditch, Adur (Lockbridge) and Cowfold Stream); • proposed crossings of various other ordinary watercourses including the River Arun IDB ditches; • Sullington Hill; and • the onshore substation at Oakendene.
Water environment walkover survey, 7, 8 and 9 November 2022. **Relevant site photographs are presented in Appendix 26.1.**	The purpose of the walkover was to further inform **Appendix 26.4: Hydrogeological Risk Assessment, Volume 4** of the ES (Document Reference: 6.4.26.4) and better understand the hydrogeology in targeted areas along the onshore cable route options outlined in the PEIR SIR.	The walkover survey covered key areas of interest from a hydrogeological point of view within the Worthing Chalk area including the following: • crossing of the Warningcamp Hill valley within SPZ2 of the Warningcamp public water supply; • onshore cable corridor route option within SPZ2 of Angmering public water supply; and • onshore cable corridor route option within SPZ2 / 3 of the Patching public water supply. During the walkover survey, the team also targeted areas where there was an indication for potential for karst features identified by Southern Water survey data. Geophysical karstic surveys were completed in May 2023 and these have been presented within **Annex B** of **Appendix 26.4: Hydrogeological Risk Assessment, Volume 4** of the ES (Document Reference: 6.4.26.4).

Data limitations

26.5.4 From the data sources in **Table 26-13** the data have overall been appropriate for the purposes providing a suitable baseline assessment in **Section 26.6**, with the following limitations taken into account.

26.5.5 A data request was submitted to Southern Water for historic sewer flooding information in August 2020. This information was requested to inform the baseline conditions section of the FRA in **Appendix 26.2: Flood Risk Assessment, Volume 4** of the ES (Document Reference: 6.4.26.2). Southern Water has responded stating that it is unable to provide this information on the grounds of General Data Protection Regulations (GDPR). Further correspondence was undertaken to check whether it could be provided by redacting personal information. However, in October 2020, Southern Water said that this would still constitute personal data and that it would not be providing this information. In lieu of this information the FRA has utilised other summary information of the records where it is available in the form of SFRAs for local planning authorities.

26.5.6 HDC, MSDC and AWDC noted that they were unable to provide information relating to the purpose of PWSs (domestic, industrial, agriculture), and that information was based on users' responses. It has been assumed that all the PWSs provide unlicensed potable domestic drinking water supplies, in order to assign an appropriate conservative level of value (in **Section 26.8**).

26.5.7 Following the first statutory consultation exercise in 2021 on 20 August ADC provided further clarification on the purpose of PWSs within Arun district and this information has been incorporated into the baseline assessment in **Section 26.6**. ADC also confirmed that the coordinates were to the best of its knowledge based on users' responses. ADC was requested to carry out individual site surveys to verify source coordinates for domestic supplies at Brookbarn House Borehole, Lample House Borehole and Pauls House. These surveys were carried out for Brookbarn House and Pauls House on 22 June 2022 and information was received in the format of confirmed coordinates. The Pauls House PWS survey could not be completed by ADC due to the resident declining access at the time.

26.6 Baseline conditions

Current baseline

Climate

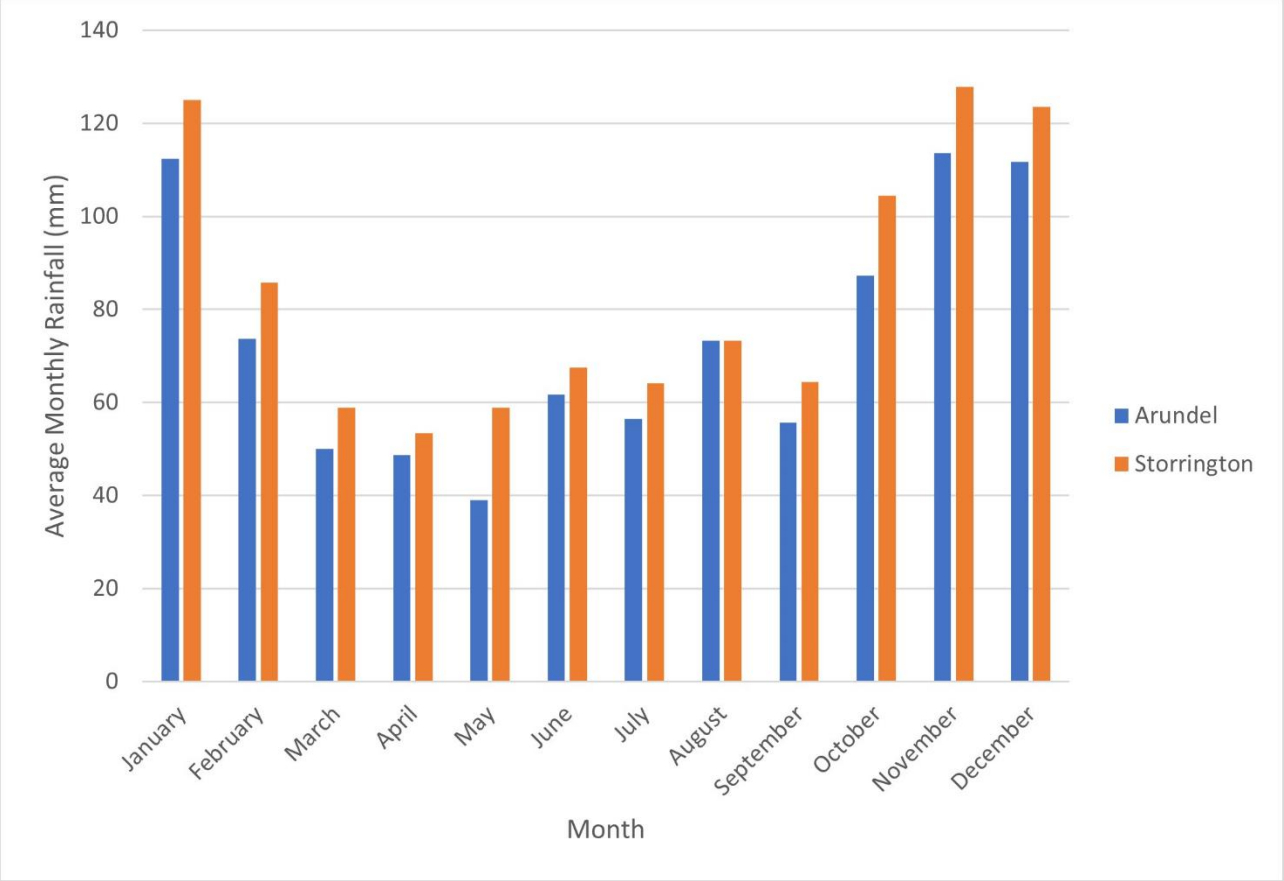
26.6.1 The Meteorological Office (Met Office) website holds the latest set of 30-year rainfall averages, covering the period 1981-2010 (Met Office, 2021). Average annual rainfall of 722.7mm/a and 725.1mm/a are recorded for climate stations at Shoreham Airport (NGR TQ 204051, 10km south-east of the proposed DCO Order Limits) and Bognor Regis (NGR SZ 937988, 5.9km west of the proposed DCO Order Limits) respectively. The Shoreham Airport climate station is located within the River Arun catchment, whilst the Bognor Regis climate station is located within the Arun and Western Streams catchment.

26.6.2 Rainfall datasets were also obtained from the Environment Agency from its rain gauges at its Arundel (NGR TQ 003073) and Storrington (TQ 107151) climate stations which are situated approximately 2.8km to the north-west and 1.3km to the north respectively of the closest points of the proposed DCO Order Limits where it crosses Lyminster and Washington, West Sussex respectively. Based on these data the average annual rainfall recorded between January 2009 and

December 2019 inclusive was 883.3mm at Arundel and 1066.77mm at Storrington.

26.6.3 **Graphic 26-1** illustrates the average monthly rainfall that has been recorded at each of the Environment Agency stations during the 2009 – 2019 period, which represents the most complete rainfall record for both locations[6]. This information indicates that the periods of highest rainfall in a typical year are expected between October and January, during the autumn and early winter.

Graphic 26-1 Average monthly rainfall totals recorded at Arundel and Storrington Environment Agency Climate Stations, January 2009 and December 2019 inclusive



Topography and land use

26.6.4 The proposed DCO Order Limits cover a varied terrain, ranging from a flat and low-lying coastal area at the landfall where the ground level is 0mAOD (Above Ordnance Datum) at Mean Low Water Spring (MLWS) adjacent to Climping (NGR

[6] For the periods of 2020 to the end of 2022 both the Arundel and Storrington Environment Agency rainfall data have numerous missing values. For Arundel, this included the whole month of December 2020, as well as other months in 2022. For Storrington, the data from mid-2021 are missing.

TQ 010008) to higher elevations across the South Downs hills such as Blackpatch Hill at 169mAOD (NGR TQ 095096) and Sullington Hill at 205mAOD (NGR TQ 092120) near Washington, West Sussex (NGR TQ 092120). From Washington, West Sussex, the onshore cable corridor drops down into the River Adur valley, where elevations are typically only between 10 to 30m AOD within the vicinity of the onshore cable corridor and the onshore substation site at Oakendene.

26.6.5 Land use within the proposed DCO Order Limits is predominantly arable and improved grassland (from the United Kingdom Centre for Ecology and Hydrology (UKCEH) Land Cover Map 2015 dataset).

Hydrology

26.6.6 The onshore part of the proposed DCO Order Limits extends approximately 38.8km from the landfall at Climping in the River Arun catchment to the onshore substation site in the proximity of Oakendene within the River Adur catchment. The following paragraphs describe the hydrological characteristics of the main surface water catchments and watercourses, as shown in **Figure 26.1, Volume 3** of the ES (Document Reference: 6.3.26) and in more detail in **Figure 26.2, Volume 3** of the ES (Document Reference: 6.3.26).

River Arun Catchment

26.6.7 The River Arun is tidal as it flows through the onshore part of the proposed DCO Order Limits. Its freshwaters are derived from the series of small streams that form its source in the area of St Leonard's Forest in the Weald (NGR TQ 213315), approximately 10.5km to the north-east of the proposed DCO Order Limits. The River Arun becomes tidally influenced approximately 3km upstream of the confluence with the River Rother at Pulborough (NGR TQ 034180). It then flows south through a gap in the South Downs to Arundel (NGR TQ 018069) and on into the English Channel at Littlehampton. The south-western part of the proposed DCO Order Limits covers the meandering flood plain stretch of the River Arun from the coast to Arundel. Along this section of the River Arun there is a proposed onshore cable corridor crossing (NGR TQ 013031), located approximately 250m to the west of the Littlehampton Industrial Estate (NGR TQ 013031).

26.6.8 The Environment Agency has provided maximum daily flow level data at Littlehampton gauging station (NGR TQ 026018) for the tidal portion of the River Arun which is approximately 1.3km to the east of the proposed DCO Order Limits landfall. The flow record shows that the levels in the River Arun regularly fluctuate due to the influence of tidal activity in the vicinity of the proposed DCO Order Limits. The observed magnitude of peak river levels are also shown to increase slightly between September and March, between autumn and spring (**Graphic 26-2**).

26.6.9 There are also two river flow gauges (on the Rivers Arun and Rother) upstream of the tidal limit (**Figure 26.1, Volume 3** of the ES (Document Reference: 6.3.26)), that are respectively located 9km (NGR TQ 034179) and 15km upstream (NGR TQ046229) from the proposed DCO Order Limits. The NRFA summary statistics for these flow gauges are presented in **Table 26-15**.

26.6.10 Rivers draining low permeability clay catchments typically have baseflow indices (BFIs) in the range 0.15 to 0.35, whereas most Chalk streams have a BFI greater than 0.9 as a consequence of the high groundwater component in the river discharge. The relatively low BFIs in **Table 26-15** are a reflection of the mix of Chalk and clays in the upper Arun catchment. The tidal section that flows through the proposed DCO Order Limits is likely to have a higher groundwater inflow component due to the presence of the Chalk in the lower catchment.

Graphic 26-2 Daily maximum level / stage recorded at Littlehampton Tidal Gauge (NGR TQ 026018) during 2022

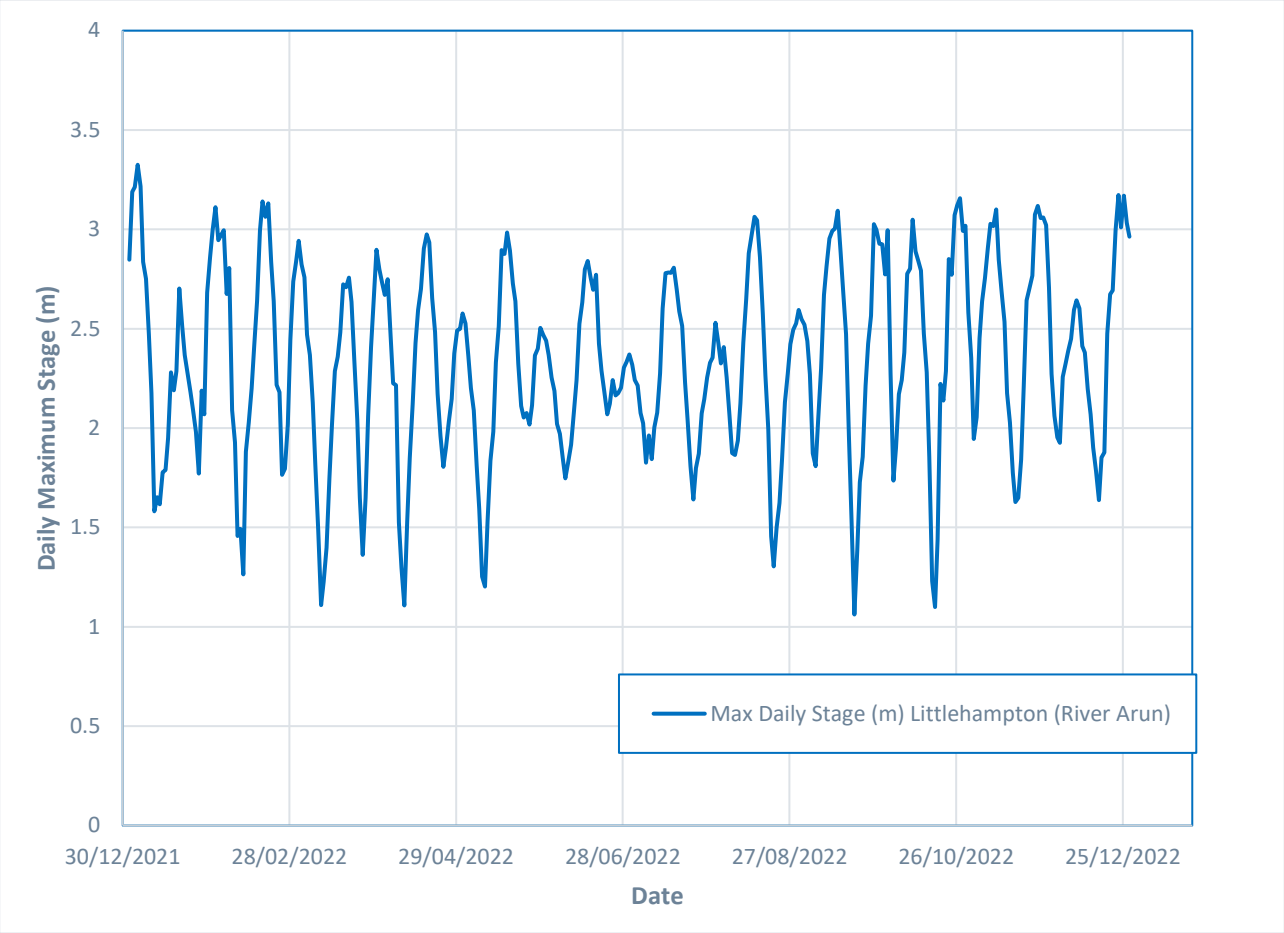


Table 26-15 Flow characteristics at selected river gauges in the Arun Catchment

Gauge reference	Gauge name	Water-course	NGR	Catchment area (km^2)	Mean flow (m^3/s)	Q10[1] (m^3/s)	Q95[2] (m^3/s)	BFI[3]	Period of record
41009	Hardham	Rother (Arun Catchment)	503400, 117900	346	4.451	10.3	1.083	0.64	1959 – 2018
41014	Pallingham	Arun	504600, 122900	379	4.107	10.24	0.275	0.29	1970-2018

Table notes:

Source: National River Flow Archive (NRFA)[7] .
[1]Q10: the flow that is equalled or exceeded ten percent of the time – an index of high flow.
[2]Q95: the flow that is equalled or exceeded 95 percent of the time – an index of low flow.
[3]BFI: baseflow index, the proportion of the total river flow that is derived from gradual release from groundwater storage, as opposed to rapid surface or near-surface runoff.

[7] NRFA data available at: https://nrfa.ceh.ac.uk/data/search [Accessed 15 December 2022].

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26.6.11 The onshore cable corridor crosses several Environment Agency Main River tributaries of the River Arun, including the Ryebank Rife and the Black Ditch, and these and other watercourses are described briefly in this section and shown on **Graphic 26-2.**

Ryebank Rife

26.6.12 The Ryebank Rife (outlined in **Figure 26.2, Volume 3** of the ES (Document Reference: 6.3.26)) is approximately 6.8km in length and flows in an easterly direction from its source in the vicinity of Yapton (NGR SU 972034) to its confluence with the tidal River Arun at Littlehampton docks (NGR TQ 015013). The watercourse is joined by several unnamed Ordinary Watercourses and ditch tributaries along its length which are managed by the Environment Agency as part of its role as the IDB for the River Arun.

26.6.13 The proposed landfall is sited approximately 300m to the south of Ryebank Rife, from which the onshore cable corridor crosses the Main River channel (NGR TQ 013019). The onshore cable corridor also crosses several of the ditch tributaries (including NGR TQ 008023, and TQ 010019) where there are a range of potential temporary and permanent access routes associated with the landfall and the onshore cable corridor.

Black Ditch (West Sussex)

26.6.14 The Black Ditch (West Sussex) (outlined in **Figure 26.2, Volume 3** of the ES (Document Reference: 6.3.26)) is approximately 7km in length and flows in a south-westerly direction from its mapped sources including Patching Pond (NGR TQ 089059) and springs near Hammerpot (NGR TQ 066058, towards its confluence with the River Arun at Arundel Junction (NGR TQ 011040). Within the Black Ditch catchment there is also a network of SDNPA Chalk streams which are in the near vicinity of the proposed DCO Order Limits including a crossing at one location (NGR: TQ 050053) (see **Appendix 26.1: Detailed water environment baseline information, Volume 4** of the ES (Document Reference: 6.4.26.1) for further details). The upper reaches of the Black Ditch catchment extend further to the north-east to Kithurst Hill (NGR TQ 081128) within the South Downs, where there is a dry valley with no mapped surface watercourses due to the high permeability and transmissivity of the underlying Chalk (see the geology and hydrogeology sections of **Appendix 26.4: Hydrogeological Risk Assessment, Volume 4** of the ES (Document Reference: 6.4.26.4) for further information).

26.6.15 Within its southern section (landfall to Hammerpot), the onshore cable corridor crosses the Black Ditch channel near its confluence to the north of Brook Barn Farm (NGR TQ 014042). Within the central section (Hammerpot to Sullington Hill), the onshore cable corridor also traverses several ditches within the upper reaches of the Black Ditch catchment between Poling and Sullington Hill.

Other tributaries of the River Arun

26.6.16 Within the southern section between Lyminster and Hammerpot, the onshore cable corridor crosses an unnamed Ordinary Watercourse (NGR TQ 037051) which is under the management of the Environment Agency as the IDB.

26.6.17 Within the central section (on the eastern slopes of Sullington Hill), approximately 1.1km of the onshore cable corridor also crosses the upper catchment boundary of the River Stor catchment. Within this part of the River Stor catchment there are no tributary watercourses intersected by the onshore cable corridor. There is a series of ponds (NGR TQ 123134) approximately 120m to the north of the proposed DCO Order Limits and Washington Road A283. There is also a spring between Kithurst Farm and Garston Farm (NGR TQ 082136), approximately 1.2km to the north-west of the proposed DCO Order Limits.

River Adur catchment

26.6.18 The River Adur and its tributaries drain the Low Weald area through the South Downs, and the Main River flows south, entering the English Channel at the urban centre of Shoreham-by-Sea, approximately 12.3km south of the proposed DCO Order Limits. The catchment of the River Adur is extensive, covering in excess of 600km^2, and within its upper reaches is underlain by the Wealden Group and is largely rural with low-lying rolling hills of arable land and few built-up areas of population.

26.6.19 A number of rivers and tributaries of the River Adur converge to the north-west of Henfield (NGR TQ 210160), and approximately 170m to the east of the onshore cable corridor at its closest point, and the Adur is tidally influenced downstream of this confluence. There are numerous tributary watercourses that drain the north-eastern sections of the onshore cable corridor (Sullington Hill to Bolney), including the onshore substation at Oakendene, before joining the non–tidal and tidal sections of the River Adur.

26.6.20 **Graphic 26-3** provides the daily maximum flow record for 2019 taken from the Environment Agency Sakeham (East branch) flow gauge (NGR TQ 218189) just upstream of the tidal section, and approximately 1.4km to the south of the nearest section of the onshore cable corridor. The chart illustrates a high variability in flow and shows that a higher frequency and magnitude of peak flows are recorded during mid-October to late-December (later autumn to winter months).

26.6.21 Longer term summary statistics are presented in **Table 26-16** for this gauge, along with records for the western branch of the Adur (Lockbridge) (NGR TQ 178197) and the Chess Stream (NGR TQ 216172), which are also upstream of the tidal limit and respectively situated 1.8km and 1.9km to the north-east and west of the onshore cable corridor near Partridge Green. The summary statistics show that there is a relatively low BFI recorded at each monitoring location, which can be attributed to the catchment being underlain by relatively low permeability Wealden geological strata.

26.6.22 The proposed DCO Order Limits is intersected by a number of catchments for tributary streams and rivers which discharge into the River Adur. These include an unnamed Main River and several Ordinary Watercourses which drain into the tidal section, as well as the Honeybridge Stream, Adur (Lockbridge), Adur East and Adur East (Sakeham), Cowfold Stream and Bolney Sewer which discharge into the non-tidal section. Each of these watercourses is described briefly in this section and shown on **Figure 26.2, Volume 3** of the ES (Document Reference: 6.3.26).

Unnamed Main River and Ordinary Watercourse

26.6.23 Two catchments drain the central to northern section of the onshore cable corridor, between Upper Buncton and Bines Green, with watercourses flowing in an easterly direction into the tidal section of the River Adur.

26.6.24 The first is a Main River which is approximately 4km in length, flowing from its ephemeral tributary headwaters near Sevier's Barn (NGR TQ 153139), crossing the onshore cable corridor then flowing for 3.8km before discharge into the tidal Adur near Wyckham Wood (NGR TQ 195140).

26.6.25 There is another catchment which has several Ordinary Watercourse tributaries which range in length from 600m to 2.7km and cross the onshore cable corridor in several places prior to discharge into the tidal Adur. Within this catchment, there are two ponds alongside the tributaries, including one which is approximately 130m upstream of the proposed DCO Order Limits between Blakes Farm and Sweethill Farm (NGR TQ 177156), and one approximately 115m downstream of the proposed DCO Order Limits near Eatons Farm (NGR TQ 187163). There is also a well mapped at Godsmark Farm (NGR TQ 182168) near Ashurst approximately 400m to the west of the proposed DCO Order Limits.

Honeybridge Stream

26.6.26 The Honeybridge Stream is approximately 5.9km in length and flows in a north-easterly direction from its sources in the South Downs (NGR TQ 135127 and TQ 140127) between Washington and Buncton, West Sussex towards its confluence with Adur (Lockbridge) near Bines Green (NGR TQ 179178). Within its central section the onshore cable corridor is crossed by several minor tributary stream headwaters (such as NGR TQ 144137) which are all classed as Ordinary Watercourses. There are several springs mapped at Water Lane, Buncton (NGR TQ 144139), Castle Farm Estate (NGR TQ 126142) and Hawking Soppers (NGR TQ 157152), which are respectively situated 115m, 1km and 640m to the north of the proposed DCO Order Limits. There is also a pond (NGR TQ 146136) which lies 110m to the south of the proposed DCO Order Limits at Buncton Manor Farm. Between Lower Chancton Farm and Buncton there is also a SDNPA Chalk stream which is crossed in several locations (NGR TQ 139134; NGR TQ 140134; and NGR TQ 144137) by the proposed DCO Order Limits, as detailed in **Appendix 26.1: Detailed water environment baseline information, Volume 4** of the ES (Document Reference: 6.4.26.1) and shown on **Figure 26.2, Volume 3** of the ES (Document Reference: 6.3.26). Two of the headwaters stream locations were found to be in poor condition, whist the furthest downstream crossing adjacent to Water Lane, Buncton has been identified as holding some potential for coarse fish migration in **Chapter 22: Terrestrial ecology and nature conservation, Volume 2** of the ES (Document Reference: 6.2.22).

Graphic 26-3 Environment Agency daily maximum flow recorded at Sakeham River Gauge (TQ 218189) during 2019

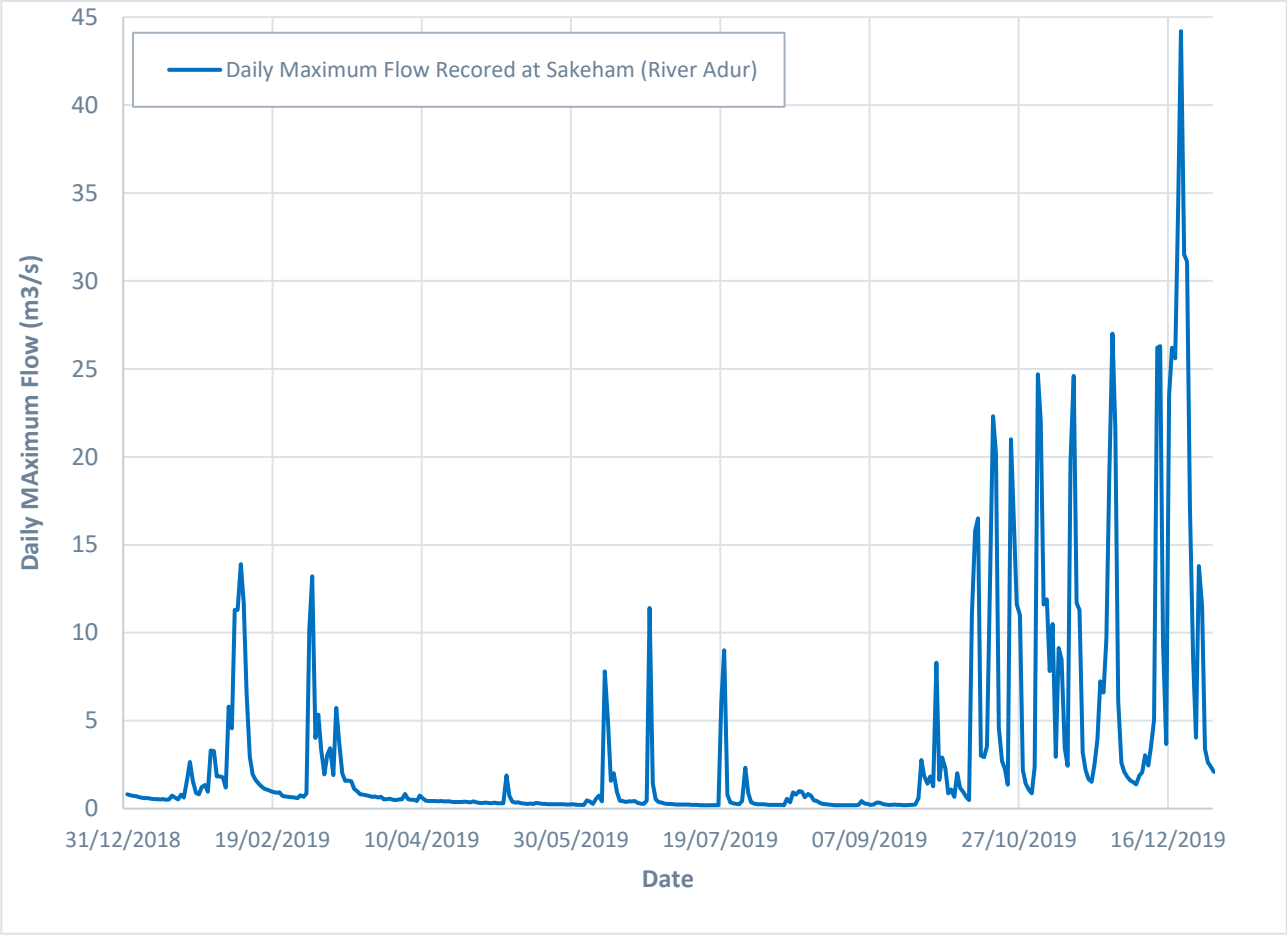

Table 26-16 Flow characteristics at selected river flow gauges in the River Adur catchment

Gauge reference	Gauge name	Water-course	NGR	Catchment area (km^2)	Mean flow (m^3/s)	Q10[1] (m^3/s)	Q95[2] (m^3/s)	BFI[3]	Period of record
41012	Sakeham	Adur East Branch	521800, 118900	93.0	1.325	2.970	0.159	0.34	1967 – 2018
41010	Hatterell Bridge	Adur West Branch	517800, 119700	109.1	1.160	3.468	0.025	0.30	1961-2005
41028	Chess Bridge	Chess Stream	521600, 117200	24.0	0.273	0.633	0.021	0.39	1964 – 2018

Table notes:

[1]Source: NRFA[8]1Q10: the flow that is equalled or exceeded ten percent of the time – an index of high flow.

[2]Q95: the flow that is equalled or exceeded 95 percent of the time – an index of low flow.

[3]BFI: baseflow index, the proportion of the total river flow that is derived from gradual release from groundwater storage, as opposed to rapid surface or near-surface runoff.

[8] NRFA data. Available at: https://nrfa.ceh.ac.uk/data/search [Accessed 15 December 2022].

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Adur (Lockbridge)

26.6.27 The Adur (Lockbridge) is an Environment Agency Main River which forms the western branch of the non-tidal River Adur and is approximately 5.5km in length, flowing in a south-easterly direction from its origins at the confluence of Adur Knepp and Blakes Gill near West Grinstead (NGR TQ 168206) towards its discharge into the non-tidal River Adur to the west of Henfield (NGR TQ 194166). The onshore cable corridor crosses a tributary and the Environment Agency main river channel (NGR TQ 190172) of Adur (Lockbridge), which has Environment Agency flood defences along its banks at the point of crossing.

Adur (East) and Adur East (Sakeham)

26.6.28 The section of the Adur eastern branch comprising the Adur (East) and Adur East (Sakeham) channel flows for approximately 6.6km in a south-westerly direction from the Goddards Green branch near Twineham Green towards its discharge point into the tidal River Adur. The north-eastern section of the onshore cable corridor runs parallel to the main channel and crosses several of its Ordinary Watercourses (such as NGR TQ 241213 and NGR SU2 42213) along the 400kv connection between the onshore substation and the existing National Grid substation at Bolney. There are also minor tributary headwaters mapped along the perimeter of the 400kv connection route to the south and east, towards the Adur (East) branch. There is also a small pond mapped approximately 260m to the south of the 400kv connection route (NGR TQ 238205). There are two mapped wells within this catchment between Frylands and Waterperry House along Frylands Lane (NGR TQ 228196 and TQ 226195) that are respectively situated 1.5km and 1.7km to the south-west of the 400kv connection part of the proposed DCO Order Limits.

Cowfold Stream

26.6.29 The Cowfold Stream is a Main River which is approximately 6.9km in length, flowing in a southerly direction from its source near Hillsfoot (NGR TQ 193231), past the hamlet of Cowfold, prior to its discharge into Adur East (Sakeham) near Shermanbury (NGR TQ 212186). The main river channel is crossed by the onshore cable corridor at NGR TQ 222211, where the channel is protected by Environment Agency flood defences. The onshore substation site at Oakendene and its associated temporary construction compound locations are also situated approximately 570m and 15m to the west of an unnamed Ordinary Watercourse tributary (NGR TQ 225223). There are also a series of wells mapped within this catchment at the Hangers (NGR TQ 208199), Ewhurst Cottages (NGR TQ213195), the Rectory (NGR TQ 222195), Park Farm (NGR TQ 223206) and the Fodges, Kent Street (NGR TQ 229210) which are respectively situated approximately 2m, 575m, 930m, 520m and 260m from the proposed DCO Order Limits.

Other tributaries of the River Adur

26.6.30 There are several other tributary watercourses of the River Adur which are in close proximity to the proposed DCO Order Limits but are not shown to intersect. These

include tributaries such as Bolney Sewer, Adur East (Goddards Green), Herrings Stream, Chess Stream, Woodsmill Stream and Black Sewer. It is also considered that there is limited potential for impacts on the lower course of the tidal Adur to the south and downstream of the discharge point from the unnamed Main River tributary at Wyckham Wood, as this is approximately 1.7km south-east of the onshore cable corridor, and also given the size of the watercourse, its tidal nature, and the dilution from the many tributary inflows described above.

Geology

26.6.31 The following sections provide a summary of the bedrock and superficial deposits which the proposed DCO Order Limits overlies and are supported by **Figure 26.3, Volume 3** of the ES (Document Reference: 6.3.26) (bedrock geology) and **Figure 26.4, Volume 3** of the ES (Document Reference: 6.3.26) (superficial geology). Further details on baseline geological conditions are provided in **Appendix 26.4: Hydrogeological Risk Assessment, Volume 4** of the ES (Document Reference: 6.4.26.4).

26.6.32 **Table 26-17** provides a summary of the bedrock encountered from the landfall at Climping towards the onshore substation site area at Oakendene.

Table 26-17 Succession of geological units along the proposed DCO Order Limits

Group / Subgroup	Lithological description	Section of the proposed DCO Order Limits
Chalk (White Chalk)	Chalk	Southern section
Lambeth Group	Clay, silt, sand and gravel	
Thames Group	Clay, silt, sand and gravel	
Lambeth Group	Clay, silt, sand and gravel	
Chalk (White Chalk)	Chalk	Central section
Chalk (Grey Chalk)	Chalk	
Gault Formation and Upper Greensand Formation (undifferentiated)	Mudstone, sandstone and limestone	

Group / Subgroup	Lithological description	Section of the proposed DCO Order Limits
Lower Greensand Group	Sandstone and mudstone	
Wealden Group	Mudstone, siltstone and sandstone	North-eastern section
Lower Greensand Group	Sandstone and mudstone	
Wealden Group	Mudstone, siltstone and sandstone	

Southern section

26.6.33 The bedrock geology beneath the first several kilometres of the proposed DCO Order Limits inland from the landfall towards Lyminster and Crossbush comprises predominantly the White Chalk subgroup. The Chalk is part of an east to west trending synclinal fold, with its axis located just to the south of Arundel.

26.6.34 Between Poling and Hammerpot, the onshore cable corridor crosses a narrow band of Thames Group (London Clay Formation) and Lambeth Group strata that form the core of the synclinal fold. The Thames Group is composed of clay, silt, sand and gravel, and along with the Chalk forms the low-lying land along the coast. The Lambeth Group comprises varying gravels, sands, silts and clays.

26.6.35 The superficial deposits are widespread within the coastal region and along the River Arun. The coastal deposits comprise beach and tidal flat deposits in the landfall area within the proposed DCO Order Limits. The proposed landfall overlaps an area of brickearth silt deposits and Raised Alluvium Marine deposits comprising of clay, silt, and sand. The onshore cable corridor then crosses an area in which the River Arun and the Black Ditch have laterally migrated, and which is therefore widely covered with Raised Marine deposits of clay, silt and sand. Superficial deposits are recorded to be up to 20 to 30m depth along the River Arun valley (BGS, 2022b).

Central section

26.6.36 Chalk forms the higher elevated topography of the South Downs and the central section of the proposed DCO Order Limits between Hammerpot and Washington, West Sussex.

26.6.37 This section is underlain by the east to west trending White Chalk subgroup which dips to the north and north-east at about 20 – 30º (Allen et al., 1997) and has a steep scarp slope on the southern side towards the band of Lambeth Group strata and the south coast.

26.6.38 Southern Water has identified potential for karst features in this region, particularly where the Lambeth Group transitions into the Chalk to the north of Hammerpot, and where there are Clay-with Flint deposits due to increased acidity of recharge waters.

26.6.39 During the site walkover on 7 November to 9 November (see **Table 26-14**), a confirmed case of sinkhole karst was identified, approximately 170m to the west of the proposed DCO Order Limits at the Lions to the north of Hammerpot. The sinkhole dimensions at this location were approximately 4m x 5m in diameter by 1.5m in depth, and the feature took water from a ditch running along the woodland in a south-westerly direction.

26.6.40 Another depression was found 50m to the west of the swallow hole (220m to the west of the proposed DCO Order Limits). This was a doline karst feature, 3m in diameter by 0.5m in depth.

26.6.41 The Hydrogeological Risk Assessment provides some further information regarding karstic features based on a combination of desk studies and initial site work (see **Appendix 26.4: Hydrogeological Risk Assessment, Volume 4** of the ES (Document Reference: 6.4.26.4)).

26.6.42 Within the central section of the proposed DCO Order Limits, in the vicinity of Buncton, the onshore cable corridor also crosses a series of bedrock geological formations in the Weald Anticline including the Gault Formation (sandstone), Upper Greensand Formation (siltstone and sandstone) and Lower Greensand Group (sandstone and mudstone). The Greensand ridge forms part of the same scarp (a steeper slope) and dip (a gentle slope) landform as the Chalk hills, dipping to the north and north-east along the South Downs.

26.6.43 Superficial deposits along this central section are indicated to be absent in comparison with the ubiquitous coverage to the south. The BGS Geoindex indicates there are narrow bands of Head clay, silt, sand and gravel deposits occurring along the base of the valleys. Some larger patches of superficial Clay-with-Flints and Head clay, silt, sand and gravel deposits are present 5km to the east of Arundel, on the slopes and at the base of the South Downs (BGS, 2022b).

North-eastern section

26.6.44 To the north and east of Buncton, the north-eastern section of the proposed DCO Order Limits predominately overlies the Wealden Clay Formation (mudstone, siltstone and sandstone), apart from a band of Lower Greensand located near Ashurst. The onshore substation at Oakendene overlies the Wealden Clay Formation.

26.6.45 The BGS data also indicates that there are approximately eight fault lines within the north-eastern section of the proposed DCO Order Limits. Four are positioned at the transition between Wealden Clay and Lower Greensand along the cable corridor near Ashurst, and the others are positioned across the Wealden Clay between Partridge Green and Cowfold along the onshore cable corridor and the onshore substation site.

26.6.46 In this area superficial deposits include patches of Alluvium (clay, silt, and sand) deposits, River Terrace deposits (undifferentiated sand and gravel) and Head

deposits (clay silt, sand and gravel). The Alluvium and River Terrace deposits follow the route of the River Adur and its associated tributaries.

Hydrogeology

Aquifer Status

Southern section

26.6.47 The Defra MAGIC website (Defra, 2023) identifies the White Chalk in the southern section of the proposed DCO Order Limits as being a Principal Aquifer[9] with high vulnerability[10]. The Lambeth Group (clay, silt, sand and gravel) aquifer within the southern section is classified as a Secondary A Aquifer[11] with medium to high groundwater vulnerability.

26.6.48 With respect to superficial deposits aquifer status, the MAGIC website (Defra, 2023) identifies the brickearth beach deposits and tidal Arun Alluvium as a Secondary A Aquifer and the London Clay Formation near Crossbush is identified as unproductive strata.

Central section

26.6.49 The White Chalk underlying the central section of the proposed DCO Order Limits between Hammerpot and Sullington Hill is classified as being a Principal Aquifer with high vulnerability. The Upper and Lower Greensand Group within the central section of the proposed DCO Order Limits in the vicinity of Washington, West Sussex and Buncton, West Sussex respectively is identified as a “highly productive and extensive” Principal Aquifer. Flow is dominantly intergranular and can yield up to 50l/s, and the aquifer is classed as highly vulnerable. The Gault Formation north of Washington, West Sussex is indicated as comprising unproductive strata and is of low groundwater vulnerability.

26.6.50 In relation to the superficial deposits, there are very limited narrow bands of Secondary (undifferentiated) Aquifer associated with the sparse Head deposits and Clay-with-Flint deposits within the central section of the proposed DCO Order Limits between Hammerpot and Sullington Hill.

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[9] These are layers of rock or drift deposits that have high intergranular and/or fracture permeability, meaning they usually provide a high level of water storage. They may support water supply and/or river base flow on a strategic scale. In most cases, Principal Aquifers are aquifers previously designated as major aquifer.

[10] The term vulnerability in this context means the overall likelihood of a pollutant reaching the groundwater. The Environment Agency vulnerability maps have five risk categories (High, Medium – High, Medium, Medium – Low, and Low) based on the type of aquifers present and the potential impact (on the aquifer designation).

[11] These are permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. These are generally aquifers formerly classified as minor aquifers.

North-eastern section

26.6.51 Within the River Adur catchment and in the north-east of the proposed DCO Order Limits, the Wealden Clay Formation is shown as being unproductive strata with low groundwater vulnerability.

26.6.52 Alluvium / River Terrace and Head superficial deposits within the north-east of the proposed DCO Order Limits are designated as a Secondary (undifferentiated) Aquifer and Secondary A Aquifer respectively. The Secondary (undifferentiated) Aquifer is associated with the tidal portion of the River Adur. The Secondary A Aquifer is associated with the main freshwater tributaries of the River Adur such as the Cowfold Stream and the River Adur East, upstream of the confluence near Henfield.

Groundwater levels and flows

26.6.53 The 1:625,000 scale Hydrogeological Map of England and Wales (BGS, 2022a) indicates that groundwater level fluctuation is common within the top 80m of the Chalk. The map shows groundwater levels as being typically around 0mAOD within the Chalk along the coastal area trending to between 30 and 60mAOD on the South Downs (over 100 metres below ground level (mbgl) at higher elevations).

26.6.54 The Chalk forms a well-drained terrain with lime-dominated topsoils that are often very shallow and can sustain limited vegetation cover. Rain can easily infiltrate through the thin soils to the underlying Chalk aquifer, with groundwater emerging along a scarp-slope spring line further downgradient towards the lower reaches of the River Arun and River Adur catchments.

26.6.55 Groundwater flow lines on the 1:100,000 scale Hydrogeological map of the South Downs are indicated along the valleys, where higher Chalk transmissivity (permeability-dependent) is reported. Close to the River Arun and River Adur valleys the groundwater contours indicate flow towards the watercourses, but away from this influence, groundwater flow is predominantly to the south towards the coast. Groundwater from the Chalk is likely to discharge into the river as baseflow at a relatively constant rate throughout much of the year. However, when groundwater levels rise groundwater flooding can occur, particularly in the broad Chalk valleys.

26.6.56 The 1:100,000 scale Hydrogeological Map (BGS, 1977) shows that in the southern section of the proposed DCO Order Limits the groundwater levels within the Chalk Formation typically range between 3mAOD and 20mAOD (approximately 30 – 35mbgl respectively), with groundwater flow to the south and south-west towards the River Arun. Across the South Downs and the central section of the proposed DCO Order Limits between Angmering and Sullington Hill Chalk, groundwater levels range between 50mAOD and 70mAOD (50mbgl and 135mgl respectively), with groundwater flowing in a south and south-west direction towards Clapham, Patching and Angmering (see the subsequent **paragraphs 26.6.71** to **26.6.73** on water resources in relation to their SPZs).

26.6.57 The proposed DCO Order Limits crosses an area of shallow groundwater where the Chalk meets the Lambeth Group to the south of the Angmering SPZ. Information from an Environment Agency observation borehole log at Hammerpot

Old Barn (TQ 00665 00577) indicates that between June 2002 and March 2022 the average recorded groundwater level was around 7mAOD and the maximum recorded groundwater level was approximately 12.9mAOD, the latter being within several metres of the ground surface around that location (15mAOD).

26.6.58 The 1:100,000 scale Hydrogeological Map indicates that there is a clear divide in groundwater flow at the point where the onshore cable corridor crosses Sullington Hill. To the north and east of Sullington Hill groundwater levels within the Lower Greensand Formation fall from greater than 60mAOD near Green Farm to below 0mAOD near Buncton and Wiston (approximately between 100 to 20mbgl respectively), approximately 4km to the east.

26.6.59 The online BGS (2022b) GeoIndex Viewer describes the Weald Clay Formation (Wealden Group) in the north-east of the proposed DCO Order Limits as being low permeability and generally having no groundwater except at shallow depths. The predominantly thick clayey sequence with subordinate sandstones may occasionally support domestic water supplies.

26.6.60 The Weald Clay retards infiltration and is further characterised by standing surface water features and higher rates of surface flow at times of heavy rainfall. Consequently, flow in the River Adur can respond rapidly to rainfall.

Hydraulic properties

26.6.61 **Table 26-18** provides an overview of the range of hydraulic properties for the Principal and Secondary aquifers underlying the proposed DCO Order Limits, based on typical values obtained from Allen et al., (1997) and Jones et al. (2000). This summary indicates that transmissivity and storage exhibits the largest range within the Chalk, due to the importance of fissure flow as a flow mechanism within this aquifer. In contrast, the Upper and Lower Greensand Formations show less variation in their hydraulic characteristics given that intergranular flow is the dominant flow mechanism in these aquifers.

Table 26-18 Aquifer hydraulic properties

Hydraulic properties	Chalk	Lower Greensand	Upper Greensand
Storage Coefficient (S) (dimensionless)	2–X 10^{-4} - 0.032	10^{-5} to 0.08	0.0002 – 0.013
Transmissivity (m^2/d)	16 to 9,500	33 to 34–0	1.24 - 1565
Geometric Mean Transmissivity (m^2/d)	500	270	64

26.6.62 The available hydrogeological data for the Chalk indicates that there is an inverse relationship between transmissivity and water level depth, that is, where water

levels are shallow, for instance in valleys, transmissivity tends to be high and in areas with deeper water levels transmissivity is generally low. As such, water table depth is an important indicator of groundwater flow activity in the South Downs within the central section of the proposed DCO Order Limits.

26.6.63 Within the Chalk significant permeability tends to be developed towards the top of the aquifer. The frequency and size of fissures and fractures decrease at depth due to increasing overburden and is accompanied with an overall reduction in circulating groundwater and associated dissolution. The most important flow horizons are concentrated in the near surface, with little flow deeper than 50m below groundwater levels. As noted in **paragraph 26.6.38** to **26.6.42** there is potential for karst in the wider geological setting, however none has been identified along the onshore cable corridor. Further information on the site walkover and hydrogeological baseline is provided in **Appendix 26.4: Hydrogeological Risk Assessment, Volume 4** of the ES (Document Reference: 6.4.26.4).

26.6.64 An important factor that determines the development of fracturing at depth is the lithology. Where the Chalk is softer and more marly fracturing is less well developed and groundwater flow less active. The permeability within harder nodular Chalks (typically referred to as 'hardgrounds') is often higher than in the surrounding rocks. The Upper and Middle Chalk lithological hardground groups of Lewes Nodular Chalk, New Pit Chalk and Holywell Nodular Chalk overlying the central section of the proposed DCO Order Limits usually exhibit higher permeabilities than the surrounding Chalk.

Aquatic environment

WFD Classifications

26.6.65 **Appendix 26.1: Detailed water environment information report, Volume 4** of the ES (Document Reference: 6.4.26.1) indicates that within the Study Area there are 23 conservation water bodies, of which 16 have a potential for a connection with the Proposed Development due to having features intersected or directly adjacent to the proposed DCO Order Limits (**Figure 26.2, Volume 3** and **Figure 26.5, Volume 3** (Document Reference: 6.3.26)). The 16 WFD water bodies are screened in for further assessment in **Sections 26.9** to **26.11**, and comprise one coastal water body, two transitional water bodies, seven river water bodies and six groundwater bodies.

26.6.66 **Appendix 26.1: Detailed water environment information report, Volume 4** of the ES (Document Reference: 6.4.26.1) and **Appendix 26.3: Water Framework Directive compliance assessment, Annex A, Volume 4** of the ES (Document Reference: 6.4.26.3) presents further information on the WFD condition, supporting elements at less than Good overall status and issues for each of these 16 WFD water bodies. The overall condition of each WFD water body is summarised later in **Section 26.8** to help inform determination of their value.

Conservation sites

26.6.67 **Appendix 26.1: Detailed water environment baseline information, Volume 4** of the ES (Document Reference: 6.4.26.1) provides details of eight water

dependent conservation sites within the Study Area (**Figure 26.2, Volume 3** of the ES (Document Reference: 6.3.26)), as indicated on the Defra MAGIC (2023) and Natural England websites. Based on their location, and their potential for a surface water hydrological and hydrogeological connections, the following sites have been screened in for further assessment within **Sections 26.9** to **26.11**:

- Amberly Mount to Sullington Hill SSSI comprises groundwater-dependent Chalk grassland on the scarp northern slopes of Sullington Hill. It lies on the edge of the proposed DCO Order Limits along the western edge of an access track, and is approximately 160m to the north-west and downgradient of the onshore cable corridor;
- Bines Green LWS has features including neutral grassland and a surface water pond with high botanical interest. The associated surface water pond is situated 200m to the north-east of and at the same elevation as the proposed temporary construction access point; and
- Rock Common Sand Quarry Local Geological Site (LGS) has its south-western corner overlapping with the proposed DCO Order Limits near Washington, West Sussex.

26.6.68 In addition to these sites, within the hydrology section of this chapter and **Appendix 26.1: Detailed water environment baseline information, Volume 4** of the ES (Document Reference: 6.4.26.1) various ponds and springs (shown on 1:25,000 OS mapping) have been identified as potential receptors which are also considered in the assessment within **Sections 26.9** to **26.11**.

Water resources

Private water supplies

26.6.69 ADC, HDC, MSDC and AWDC were all contacted regarding the presence of PWSs within their relevant part of the Study Area. Each has provided a list of registered users though HDC, MSDC and AWDC were not able to confirm the type or exact location of the PWSs. In August and October 2021, ADC provided correspondence confirming the types and locations of the PWSs within its district. As outlined in **paragraph 26.5.6**, it has been assumed that for the other councils, where the nature of the supply is not known, that it pertains to an unlicensed potable supply (in **Section 26.8**). From the 23 PWSs identified in **Appendix 26.1: Detailed water environment baseline information, Volume 4** of the ES (Document Reference: 6.4.26.1) and shown on **Figure 26.6, Volume 3** of the ES (Document Reference: 6.3.26), 14 are assessed as having a potential hydrological or hydrogeological connection to the proposed DCO Order Limits, and are included in the assessment in **Sections 26.9** to **26.11**.

26.6.70 In addition to this, within the hydrology section of this chapter (**paragraphs 26.6.6** to **26.6.30**) various wells (visible on 1:25,000 OS mapping) have been identified. None of these features are registered with the district councils as PWSs and therefore may not be in use. However, as part of the precautionary assessment approach they too have also been considered as potential receptors in the assessment in **Sections 26.9** to **26.11**.

Licensed abstractions

26.6.71 The Study Area intersects numerous SPZs which are classified as Safeguard Zones and Drinking Water Protected Areas (DWPAs) on the Defra MAGIC website (Defra, 2023).

26.6.72 The proposed temporary construction corridor crosses the inner SPZ2s associated with the Southern Water public water sources at Angmering (10/41/310210, NGR TQ 064065) and Patching (10/41/310210, NGR TQ 091074), within the Worthing Chalk groundwater catchment. There is a proposed temporary construction and operational route along Michelgrove Lane within SPZ1 which will require minor road upgrades at several locations (A-26). There is also another light construction access route within Warningcamp SPZ1, which utilises existing farm tracks (A-25). Relevant environmental measures (C-246, C-250, C-251 and C-253) have been embedded within **Table 26-20** in **Section 26.7** to ensure the protection of these public water supplies (along with other licensed abstractions and PWSs) during proposed works. There are also several other more distant SPZs within the wider Study Area.

26.6.73 The Environment Agency was contacted to obtain details on licensed abstractions within the Study Area. **Appendix 26.1: Detailed water environment baseline information, Volume 4** of the ES (Document Reference: 6.4.26.1) provides details of the 74 licensed abstractions that have been identified (**Figure 26.6, Volume 3** of the ES (Document Reference: 6.3.26)), and presents the results of a screening exercise based on their topographical, hydrological and hydrogeological characteristics to determine whether they are potentially connected to the proposed DCO Order Limits. 31 licensed abstractions are considered to have a potential hydrological and hydrogeological connection and have been screened in for further assessment within **Sections 26.9** to **26.11**. The majority of these supplies are groundwater-fed supplies situated within the Principal Chalk aquifer to the south and west of the central section of the proposed DCO Order Limits between Hammerpot and Sullington Hill.

Consented discharges

26.6.74 **Appendix 26.1: Detailed water environment baseline information, Volume 4** of the ES (Document Reference: 6.4.26.1) also identifies details of four Environment Agency consented discharges that are located within the proposed DCO Order Limits (**Figure 26.6, Volume 3** of the ES (Document Reference: 6.3.26)) and have been screened in for assessment within **Sections 26.9** to **26.11**.

Flood risk

26.6.75 This section provides an overview of the baseline sources of flood risk within the proposed DCO Order Limits. An FRA has been provided within **Appendix 26.2: Flood Risk Assessment, Volume 4** of the ES (Document Reference: 6.4.26.4) that considers each of these sources of flood risk in more detail.

Fluvial and tidal flood risk

26.6.76 The Environment Agency's Flood Zone mapping provides an indication of the likelihood of flooding from fluvial and or tidal sources, with Flood Zones 1, 2, and 3

indicating a low, medium and high annual probability of flooding, respectively. Flood Zone extents are shown in **Figure 26.7, Volume 3** of the ES (Document Reference: 6.3.26) (any area not highlighted on these maps is Flood Zone 1).

26.6.77 The most significant areas of Flood Zones 2 and 3 are located in the lower tidal reaches of the River Arun at Littlehampton in the southern section of the onshore cable corridor, and on the River Adur and the Cowfold Stream in the north-eastern section of the onshore cable corridor. The central section of the onshore cable corridor between Warningcamp and Ashurst sits within Flood Zone 1.

26.6.78 In the southern section of the proposed DCO Order Limits at the landfall adjacent to Littlehampton, the primary source of flood risk is combined fluvial and tidal flooding associated with the River Arun and/or direct from the sea itself. The landfall and majority of the onshore temporary construction corridor is situated within Flood Zone 3 south-west of Crossbush. The Environment Agency flood defence dataset shows defences along the length of the lower River Arun adjacent to Littlehampton, and along the Black Ditch and Ryebank Rife tributaries. Within **Appendix 26.2: Flood Risk Assessment, Volume 4** of the ES (Document Reference: 6.4.26.2), third party receptors have been identified that could potentially be at increased risk of tidal fluvial flooding and/or combined tidal and fluvial flooding, and therefore these have been screened in for further assessment within **Sections 26.9** to **26.11**.

26.6.79 Localised areas of the north-eastern section of the proposed DCO Order Limits are at risk of fluvial and/or combined tidal and fluvial flooding associated with the River Adur and the Cowfold Stream (the River Adur is tidal for much of the section intersected by the site). The onshore cable corridor intersects Flood Zone 3 in several locations adjacent to Bines Green (NGR 518867 117300), Homeland's Farm (NGR 519469 118349), Pook's Farm (NGR 522028 119955), and Moatfield Farm (NGR 522262 121140). Environment Agency flood defences are shown along the River Adur western branch downstream of Pinlands Farm, along the length of the River Adur eastern branch and Cowfold Stream.

Surface water flood risk

26.6.80 The Environment Agency's Risk of Flooding from Surface Water (RoFSW) mapping has been used to give an indication of the broad areas likely to be at risk of surface water flooding and is summarised in **Figure 26.8, Volume 3** of the ES (Document Reference: 6.3.26).

26.6.81 The Environment Agency's RoFSW mapping indicates that overall interactions with surface water pathways along the proposed DCO Order Limits are minimal with limited, confined spatial extents. The majority of surface water flood risk intersecting the proposed DCO Order Limits is associated with the fluvial flood extents associated with the Main Rivers discussed above (**paragraphs 26.6.76** - **26.6.79**) and/or crossings of minor watercourses and tributaries of the River Adur and Cowfold Stream. In addition, regions of high surface water flood risk are shown to intersect the onshore substation site, and temporary construction compound locations at Washington, West Sussex in the central section (Honeybridge Stream tributary) and Oakendene (Cowfold Stream tributary) within the north-eastern section of the proposed DCO Order Limits.

26.6.82 Within **Appendix 26.2: Flood Risk Assessment, Volume 4** of the ES (Document Reference: 6.4.26.2), third party flood risk receptors have been identified that could potentially be at increased risk of surface water flooding, and these have been screened in for further assessment within **Section 26.9** to **26.11**.

Groundwater flood risk

26.6.83 Shallow groundwater is likely to be encountered along sections of the onshore cable corridor. The south-west portion of the onshore cable corridor is underlain by Chalk bedrock, and the ADC, HDC and MSDC SFRAs all indicate the potential for groundwater flooding in this section of the onshore cable corridor.

26.6.84 The Environment Agency AStGWF indicates High (>= 75 percent) susceptibility to groundwater flooding across the majority of the southern and central sections of the proposed DCO Order Limits underlain by Chalk between landfall and near Sullington Hill. The dataset indicates a lower susceptibility of groundwater emergence in the north-eastern section of the proposed DCO Order Limits, which is overall underlain by other geology types (for example Gault Formation and Wealden Group) from Sullington Hill towards Bolney, with susceptibility ranging between 25 percent - 75 percent.

26.6.85 **Appendix 26.2: Flood Risk Assessment, Volume 4** of the ES (Document Reference: 6.4.26.2) has identified that groundwater emergence of interception of shallow groundwater is most likely to occur at the following locations:

- within the Arun valley adjacent to Littlehampton and Lyminster;
- within the low-lying valley draining to the River Arun, adjacent to Poling;
- where the onshore temporary construction corridor passes through low ground at the foot of Sullington and Barnsfarm Hill, adjacent to Washington, West Sussex; and
- within the Adur Valley adjacent to Bines Green, Partridge Green, Pooks Farm and Moatfield Farm.

Sewer flood risk

26.6.86 The risk of flooding from sewers is likely to be limited to where the proposed DCO Order Limits intersects urban areas.

26.6.87 Sewer flood risk information from the ADC, HDC and MSDC SFRAs has been presented within **Appendix 26.2: Flood Risk Assessment, Volume 4** of the ES (Document Reference: 6.4.26.2). The highest number of historical incidents of sewer flooding across the proposed DCO Order Limits was recorded within the ADC along the urbanised coastal front near the proposed landfall at Climping. Further along the onshore cable corridor, historical incidents are generally low since the region is predominantly rural. The closest other incidents were recorded at Ashington approximately 2km to the north of the proposed DCO Order Limits which pass through the central section of the onshore cable route around Washington, West Sussex.

Artificial sources of flood risk

26.6.88 **Appendix 26.2: Flood Risk Assessment, Volume 4** of the ES (Document Reference: 6.4.26.2) identifies several impoundments upstream of the eastern and western branches of the River Adur that in the event of failure could result in flooding towards the Proposed Development. However, the likelihood of such a dam failure event occurring is considered to be extremely low owing to the risk management measures in place for large storage reservoirs.

Future baseline

26.6.89 Some of the baseline conditions outlined in the current baseline section above may change even if the Proposed Development were not to go ahead, for the following reasons:

- Climate change: the concept of climate change is well documented, the main implication for the United Kingdom appearing to be more rainfall seasonality, with wetter winters and drier summers. This will, of course, have implications for river flows, tidal and groundwater levels, although these effects are difficult to quantify at present. Information regarding climate change was obtained from the UK Climate Projections (UKCP18, 2020) website. The UKCP18 is a climate analysis tool which features comprehensive projections for different regions of the UK. Based on a high emissions scenario, the central estimate climate information for the south coast of England indicates that mean summer temperatures could increase by approximately 7 °C between 2080 and 2100. The central estimate also predicts that summer precipitation could reduce by up to 50 percent before 2100. Summer rainfall reductions are projected to be highest in the south of England relative to the rest of the United Kingdom. The projections also show a pattern of increases in winter precipitation over southern coastal regions towards 2100. Therefore, in winter months there could be an increase in rainfall. If climate change leads to drier summers there is potential for increased pressures on increased demand from water users and habitats supporting sensitive species. Current projections also indicate that summer storms are likely to be more intense and frequent and this may lead to more extreme flow values immediately following such events, with consequential flooding issues;
- Sea level rise: the proposed landfall is situated along the Arun to Pagham section of the coast which is protected by an existing sea defence, formed by a shingle beach which is actively managed to provide a 1 in 200 year standard of protection at present. This coastal section is considered to be very vulnerable, not just to overtopping but to erosion and natural coastal realignment. The short term strategy of the Environment Agency is to maintain the defence for as long as possible, and in the longer term there could be a shift of coastline landwards as part of a wider strategy of natural realignment in response to projected changes in sea level rise (Environment Agency, 2015);
- Changes in abstraction: changes in the location and rate of surface and groundwater abstractions could occur over time, and variations in the groundwater flow regime may result in changes to the aquifer status and SPZ designations;

- Changes in WFD water body status: WFD water bodies have an overall target of Good condition by 2027 unless a lower condition is justified by way of technical infeasibility or disproportionate cost. For the purposes of the assessment, all water bodies outlined in **Appendix 26.1: Detailed water environment information report, Volume 4** of the ES (Document Reference: 6.4.26.1) that are currently Moderate condition or less have been assumed to have reached Good condition during the operation and maintenance phase of the Proposed Development, between 2027 and the 2050s; and
- Changes in land use: changing land use in the form of changing agricultural land management practices, urban development or development of industrial sites could cause changes to the hydrological, hydrogeological and geological conditions over time. The land use changes could result in changes in patterns and rates of infiltration, changes in flow pathways and sources of sediment inputs, direct physical changes to WFD water bodies, and/or the introduction or removal of sources of pollution. Although there is expected to be some urban development along the proposed DCO Order Limits (for instance on the western outskirts of settlements such as Littlehampton), the existing land uses are expected to remain largely unchanged during the lifecycle of the Proposed Development.

26.7 Basis for ES assessment

Maximum design scenario

26.7.1 Assessing using a parameter-based design envelope approach means that the assessment considers a maximum design scenario whilst allowing the flexibility to make improvements in the future in ways that cannot be predicted at the time of submission of the DCO Application. The assessment of the maximum adverse scenario for each receptor establishes the maximum potential adverse impact and as a result impacts of greater adverse significance would not arise should any other development scenario (as described in **Chapter 4: The Proposed Development, Volume 2** of the ES (Document Reference: 6.2.4)) to that assessed within this Chapter be taken forward in the final scheme design.

26.7.2 A change request **[AS-046]** to the DCO Application was accepted by the Examining Authority on 24 July 2024 **[PD-018]**. These changes included minor reductions to the proposed DCO Order Limits (onshore only) where adjacent to areas of Ancient Woodland to provide a 25m buffer from these features. Further localised reductions to the extent of Works 9 and 19 were also made, assigning these areas to a class of work with lower impacts from those previously assessed as cable installation. The changes made result in no new or different effects from those reported in this chapter of the ES. The figures supporting this chapter of the ES have not been updated due to the minor nature of these changes, the final proposed DCO Order Limits and Works areas should be viewed on the **Onshore Works Plans** (Document Reference: 2.2.2 and [AS-026].

26.7.3 The maximum assessment assumptions that have been identified to be relevant to water environment are outlined in **Table 26-19** and are in line with the Project Design Envelope (**Chapter 4: The Proposed Development, Volume 2** of the ES (Document Reference: 6.2.4)).

Table 26-19 Maximum assessment assumptions for impacts on water environment

Project phase and activity	Maximum parameters and assessment assumptions	Justification
Construction and Decommissioning	Landfall • the temporary construction compound will be used for HDD activities, cable pulling and construction of the TJBs; and • the location of these works will be located behind Climping Beach within the proposed DCO Order Limits. Onshore cable corridor • the width of the onshore cable corridor for surface open trenching is up to 40m (widened in locations where there is a technical necessity, such as at trenchless crossing sites) within the proposed DCO Order Limits, which has an approximate length of 38.8km; • the target minimum excavation depth of the cable will be 1.2m (subject to cable burial risk assessment); • up to five temporary construction compound locations, with a duration of up to 3 years and 6 months at each; • the width of the temporary construction haul road is 6m at its widest; and • temporary construction haul road aggregate depth is approx. 0.3m.	The proposed DCO Order Limits represents the areas where landfall construction works may result in effects to the water environment and provides the worst – case assessment to allow for micro siting of the landfall infrastructure. The proposed DCO Order Limits represents the areas where onshore temporary construction corridor works may result in effects on the water environment and provides for worst case scenario.

Project phase and activity	Maximum parameters and assessment assumptions	Justification
	Watercourse crossings: • the duration of temporary construction haul road watercourse crossings is up to 3 years 6 months; • the crossing schedule is provided in **Appendix 4.1: Crossings schedule, Volume 4** of the ES (Document Reference: 6.4.4.1) and shown on **Figure 26.2, Volume 3** of the ES (Document Reference: 6.3.26); and • the maximum potential for disturbance of minor drainage features is associated with culverts. Onshore substation: • up to 6 hectares (ha) onshore Oakendene substation with associated structures and infrastructure and up to 2.5ha additional temporary works area; • duration of construction: up to 3 years; and • the maximum potential for displacement of near-surface groundwater has been associated with piling construction techniques. Existing National Grid Bolney substation extension will be approximately 0.35ha with associated structures and infrastructure and a temporary works area of approximately 0.72ha.	These assessment assumptions represent the maximum potential for disturbance on water environment receptors from watercourse crossings (main rivers, ordinary watercourses and minor drainage ditches). Temporary culverting is considered to represent the worst-case crossing methodology (as opposed to trenchless crossing, and open span bridging) in terms of its potential for disturbance and associated effects on receptors' water quality and hydromorphology. The onshore substation and temporary works areas represent the areas where construction works may result in effects on water environment receptors. A worst-case assessment allows for micro siting of the onshore substation within the proposed DCO Order Limits.

Project phase and activity	Maximum parameters and assessment assumptions	Justification
Operation and maintenance	Onshore landfall and cable corridor: • all permanent cable and TJB elements will be below ground; • cables are not oil-filled; and • minimal maintenance required (periodic testing at joint boxes every 2 to 5 years) for both preventive and corrective maintenance requirements. Onshore substation: • up to 6ha onshore substation with associated structures and infrastructure; and • around 30-year operational lifetime.	These areas and timescales represent the permanent infrastructure envelopes that could result in potential effects on the water environment during the operation and maintenance phase of the Proposed Development.
Decommissioning	Onshore substation: • the decommissioning duration of the onshore infrastructure may take up to four years; and • if fully decommissioned and returned to baseline condition, maximum assessment assumptions as per Construction phase; and left in-situ with ends cuts, sealed and buried.	For the purposes of a maximum design scenario, impacts no greater than those identified for the construction phase are expected for the decommissioning phase. It is anticipated that the onshore cables will be left in-situ with ends cuts, sealed and buried to minimise effects associated with removal.

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26.7.4 The assessment of effects in this ES takes into consideration the optionality that exists for flexibility at this stage of the design of the Proposed Development (as outlined in **Chapter 5: Approach to the EIA, Volume 2** of the ES (Document Reference: 6.2.5)). For example, this ES considers the effects that could result from construction from taking forward a specific 40m onshore temporary construction corridor within the larger (~60-100m) proposed DCO Order Limits. These relevant limits of deviation have been considered and findings are presented for all potential receptors which have a connection to the relevant infrastructure type (covered under landfall, onshore cable corridor and onshore substation) as presented in **Sections 26.9** to **26.11**.

26.7.5 For instance, for the onshore cable corridor each potential receptor with a connection to the proposed DCO Order Limits has been considered, and on the basis of embedded environmental measures being implemented, a worst case magnitude of change assigned for the closest part of the proposed DCO Order Limits with a hydrological connection.

26.7.6 Therefore, effects that are more significant than those presented in this ES are not predicted to occur should any other development scenario within the project design envelope be taken forward in the final design of the Proposed Development.

Embedded environmental measures

26.7.7 As part of the Rampion 2 design process, a number of embedded environmental measures have been adopted to reduce the potential for impacts on water environment. These embedded environmental measures have evolved over the development process as the EIA has progressed and in response to consultation.

26.7.8 These embedded environmental measures also include those that have been identified as good or standard practice and include actions that would be undertaken to meet existing legislation requirements. As there is a commitment to implementing these embedded environmental measures, and also to various standard sectoral practices and procedures, they are considered inherently part of the design of Rampion 2 and are set out in this ES.

26.7.9 **Table 26-20** sets out the relevant embedded environmental measures within the design and how these affect the water environment assessment.

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Table 26-20 Relevant water environment embedded environmental measures

ID	Environmental measure proposed	Project phase measure introduced	How the environmental measures will be secured	Relevance to water environment assessment
C-1	The onshore cable route will be completely buried underground for its entire length.	Scoping	**Draft Development Consent Order (DCO)** Schedule 1, Part 1, The Authorised Development, Work No. 6, 7, 8, 9, 19	This measure will minimise interactions with the surface water environment (changes in surface water flow pathways / rates and volumetric displacement of flood water).
C-5	Trenchless crossings will be provided for features where identified in Appendix A - Crossing Schedule of the Outline Code of Construction Practice.	Scoping - updated at PEIR	**Draft DCO**, Schedule 1, Part 3, Requirement 6 (4), Cable Parameters **Draft DCO**, Schedule 1, Part 3, Requirement 22, Code of construction practice (CoCP) (4) (p)	These measures will minimise silt laden / contaminated runoff entering watercourses, changes in watercourse morphology and flow conveyance.
C-6	Where practical, sensitive sites will be avoided by the temporary and permanent onshore project footprint including SSSIs, Local Nature Reserves, Local Wildlife Sites, ancient woodland, areas of consented development, areas of historical and	Scoping - updated at PEIR	**Draft DCO**, Schedule 1, Part 1 The Authorised Development	This measure will minimise potential impacts on groundwater or surface water designated sites, ecosystems and features.

ID	Environmental measure proposed	Project phase measure introduced	How the environmental measures will be secured	Relevance to water environment assessment
	authorised landfills and other known areas of potential contamination, National Trust , Listed Buildings, Scheduled monuments, and mineral resources (including existing mineral sites, minerals sites allocated in development plans and mineral safeguarding areas).			
C-7	Post construction, reinstatement of agricultural land, or other areas of 'soft' land use where the natural soil profile is present, will be to pre-existing conditions and if remaining in agricultural use, to the original ALC grade, except where a permanent at or above ground structure including the transition joint bay, joint bays and the onshore substation and related access, landscape and drainage works are required (including over the onshore cable ducts). This will be completed in accordance with the Materials Management Plan (MMP) (C-69) and Defra 2009 Code of Construction Practice for the Sustainable Use of Soils on Construction Sites PB13298. The stage specific Soil Management	Scoping - updated at PEIR	**Draft DCO**, Schedule 1, Part 3, Requirement 22 CoCP (4) (e) **Draft DCO**, Schedule 1, Part 3, Requirement 23 Onshore construction method statement (2) (h)	This measure will minimise silt laden / contaminated runoff entering watercourses.

ID	Environmental measure proposed	Project phase measure introduced	How the environmental measures will be secured	Relevance to water environment assessment
	Plan(s) (SMP(s)) are to be used in conjunction with the MMP (and Soil Resource Plan – which will be integrated with and may form a sub-section of the MMP) to maximise the restoration of excavated soils to their pre-existing condition and location, and if this is not possible, to maximise the reuse of soils within the Proposed Development, minimising soils being relocated outside the Proposed Development or becoming waste.			
C-8	During both construction and operation, vehicle maintenance and refuelling of machinery will be undertaken within designated areas where spillages can be easily contained, and machinery will be routinely checked to ensure it is in good working condition. These areas at risk of spillage or containing hazardous materials, such as vehicle maintenance areas and hazardous substance stores (including fuel, oils and chemicals) will comply with industry good practice, be bunded, have appropriate containment and segregation and will be risk	Scoping - updated at PEIR	**Draft DCO**, Schedule 1, Part 3, Requirement 22 CoCP (4) (j) **Draft DCO**, Schedule 1, Part 3, Requirement 27 Operation phase maintenance (2) (a)	This measure will minimise the potential for accidental contamination entering watercourses or groundwater.

ID	Environmental measure proposed	Project phase measure introduced	How the environmental measures will be secured	Relevance to water environment assessment
	assessed and carefully sited to minimise the risk of hazardous substances entering the drainage system, or the local watercourses or sensitive land based receptors. Such areas will be sited at least 10m from a watercourse and away from areas at risk of flooding. Additionally, the bunded areas will have impermeable bases to limit the potential for migration of contaminants into groundwater following any leakage / spillage.			
C-9	Joint bays will be completely buried, with the land above reinstated to pre-construction ground level, with the exception of link box chambers where access will be required from ground level (via manholes). Once constructed joint bays and link box chambers will be resilient to flooding.	Scoping - updated at PEIR	**Draft DCO**, Schedule 1, Part 3, Requirement 6 Cable parameters (3)	This measure will minimise changes in runoff rates / new pathways and volumetric displacement of flood water.
C-10	No blasting is anticipated to be required and trenchless crossings will be undertaken by non-impact methods.	Scoping	**Draft DCO**, Schedule 1, Part 3, Requirement 22 CoCP (4) (g)	These measures will minimise silt laden

ID	Environmental measure proposed	Project phase measure introduced	How the environmental measures will be secured	Relevance to water environment assessment
C-11	During construction, topsoil and subsoil will be stored within the temporary working corridor of the onshore cable. The topsoil and subsoil will be stored in line with Defra 2009 Construction Code of Practice for the Sustainable Use of Soils on Construction Sites PB13298, including guidance on utilising separate stockpiles and giving due consideration to adverse weather conditions. Any suspected or confirmed contaminated soils will be separated, contained and tested before removed.	Scoping – updated at PEIR	**Draft DCO**, Schedule 1, Part 3, Requirement 22 CoCP (4) (e)	contaminated runoff entering watercourses.
C-13	In areas (or during periods of adverse weather) there may be the requirement to import aggregates to create a stable surface for construction traffic movements. Options such as bogmatting and geotextiles will be considered by the principal contractor for sensitive sections of the route to reduce impact. Selection of an appropriate measure to lower the risk of ground compaction will be made by a suitably trained/experienced person.	Scoping	**Draft DCO**, Schedule 1, Part 3, Requirement 22 CoCP (4) (e)	

ID	Environmental measure proposed	Project phase measure introduced	How the environmental measures will be secured	Relevance to water environment assessment
C-17	Trenchless crossing of watercourses will be provided in accordance with Appendix A Crossing schedule of the Outline Code of Construction Practice. Where watercourses are shown in the Crossing schedule to 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).	Scoping - updated at PEIR	The Environmental Permitting (England and Wales) Regulations 2016 **Draft DCO**, Schedule 1, Part 3, Requirement 22 CoCP (4) (p) Land Drainage Act 1991	These measures will ensure appropriate crossing methodologies are in place to minimise changes in watercourse conveyance.
C-18	Appendix A Crossing Schedule of the Outline Code of Construction Practice includes the crossing methodology which will be used for each crossing of road, rail, public right of way (PRoW) and watercourse.	Scoping	**Draft DCO**, Schedule 1, Part 3, Requirement 22 CoCP (4) (p)	
C-19	The onshore cable will be constructed in discrete sections. The trenches will be excavated, the cable ducts will be laid, the trenches backfilled and the	Scoping	**Draft DCO**, Schedule 1, Part 3, Requirement 10 Programme of works (1), Requirement 22 (4)	These measures will minimise silt laden / contaminated runoff entering watercourses,

ID	Environmental measure proposed	Project phase measure introduced	How the environmental measures will be secured	Relevance to water environment assessment
	reinstatement process commenced in as short a timeframe as practicable. At regular intervals (typically 600m – 1,000m) along the route joint bays / pits will be installed to enable the cable installation and jointing process. The stage specific CMS will set out a protocol for the reinstatement of land used temporarily for construction including the timing in accordance with C-103.		CoCP, Requirement 23 Onshore construction method statement (2) (h)	changes in watercourse morphology and flow conveyance.
C-20	The typical construction working area will be 40m along the onshore construction corridor to minimise the construction footprint. At other discrete locations this may be expanded to accommodate the working area for example for Horizontal Directional Drilling (HDD).	Scoping	**Draft DCO**, Schedule 1, Part 3, Requirement 22 (4) CoCP	
C-21	Where vegetation removal is necessary, it will be scheduled over winter to avoid the bird breeding season. If not possible for all areas, any vegetation removal will be undertaken in line with British Standard (BS) 5837:2012 (Trees in relation to	Scoping - updated at PEIR	**Draft DCO**, Schedule 1, Part 3, Requirement 22 CoCP (4) (f)	These measures will minimise potential impacts on groundwater or surface water designated and undesignated sites,

ID	Environmental measure proposed	Project phase measure introduced	How the environmental measures will be secured	Relevance to water environment assessment
	design, demolition and construction). This will be carried out under supervision and will be appropriately managed to remove the risk of damaging or destroying active nests, young or eggs. Suitable methods will also be used to ensure vegetation supporting other legally protected species is removed sensitively and in a legally compliant way.			ecosystems and features.
C-25	All aspects of the construction work will be in accordance with the Construction (Design and Management) Regulations 2015.	Scoping	Construction (Design and Management) Regulations 2015 **Draft DCO**, Schedule 1, Part 3, Requirement 22 CoCP	This measure will minimise changes to the water environment via good industry practices.
C-27	Following construction, construction compounds will be returned to previous conditions as far as reasonably possible. C-7 applies in this regard for reinstatement of soils.	Scoping	**Draft DCO**, Schedule 1, Part 3, Requirement 12 Provision of landscaping (1), Requirement 13 Implementation and maintenance of landscaping (1)	These measures will minimise silt laden / contaminated runoff entering watercourses, changes in flow rates / pathways and watercourse conveyance.

ID	Environmental measure proposed	Project phase measure introduced	How the environmental measures will be secured	Relevance to water environment assessment
			Draft DCO, Schedule 1, Part 3, Requirement 22 CoCP (4) **Draft DCO**, Schedule 1, Part 3, Requirement 23 Construction method statement (2) (h)	
C-28	Particular care will be taken to ensure that the existing land drainage regime is not compromised as a result of construction. A specialist drainage contractor / consultant will be engaged prior to construction to develop the pre- and post-construction drainage plan on agricultural land. Land drainage systems will be maintained during construction and reinstated on completion. Temporary cut-off drains will be installed parallel to the trench-line, before the start of construction, to intercept soil and groundwater before it reaches the trench. These field drains will discharge to local drainage ditches through silt traps, as appropriate, to minimise sediment release.	Scoping	**Draft DCO**, Schedule 1, Part 3, Requirement 22 CoCP (4) (b)	

ID	Environmental measure proposed	Project phase measure introduced	How the environmental measures will be secured	Relevance to water environment assessment
C-29	A depth of cover of 1.2m is assumed. Deeper trenches may be required at specific crossing locations (such as watercourses).	Scoping - updated at PEIR	**Draft DCO**, Schedule 1, Part 3, Requirement 23 Construction method statement (2) (e)	This measure will minimise the need for dewatering from trenched excavations, which will help limit potential effects upon groundwater availability.
C-30	Geotextiles or other membranes may be used to temporarily control and minimise erosion or transport of sediment from construction sites in areas that are considered unprotected.	Scoping	**Draft DCO**, Schedule 1, Part 3, Requirement 22 CoCP (4) (e)	This measure will minimise silt laden / contaminated runoff entering watercourses.
C-33	Stage specific COCPs will include measures to minimise temporary disturbance to residential properties, recreational users and existing land users. It will include details of measures to protect these receptors including the use of screen fencing at the temporary construction compounds to contribute to minimising visual and noise impacts.	Scoping	**Draft DCO**, Schedule 1, Part 3, Requirement 22 CoCP and 22 (4) (g)	This measure will protect environmental receptors such as PWSs via the implementation of the **Outline CoCP** (Document Reference: 7.2) and its specific associated measures including C-78 and C-253 (see **Table 26-20**).

ID	Environmental measure proposed	Project phase measure introduced	How the environmental measures will be secured	Relevance to water environment assessment
C-64	For temporary watercourse crossings the works will be designed to enable the free passage of fish and aquatic mammals including continuation of bed material through the culvert. During construction (for example, placing culverts or installing ducts), sections of the channel will need to be isolated using barriers that span the whole width of the channel. These isolation works will be of short duration and are expected to be completed within 48 hours of the placement of barriers to flow. Screening will take place to prevent fish being drawn into the pump.	PEIR	**Draft DCO**, Schedule 1, Part 3, Requirement 22 CoCP (4) (f)	This measure will help minimise potential effects on water dependent features including fish and aquatic mammals.
C-73	Drainage design to manage, attenuate and, if necessary, treat surface water run-off will be included in all elements of temporary and permanent infrastructure. These will be designed in accordance with Sustainable Drainage (SuDS) principles including allowances for climate change and discharged at pre-development rates. Where the development intersects overland flow pathways or areas of	Scoping - updated at PEIR	**Draft DCO**, Schedule 1, Part 3, Requirements 17 (1) and 18 (1) Surface and foul water drainage **Draft DCO**, Schedule 1, Part 3, Requirement 22 CoCP (4) (b)	This measure will help minimise changes to surface water flow rates / pathways and water quality.

ID	Environmental measure proposed	Project phase measure introduced	How the environmental measures will be secured	Relevance to water environment assessment
	known surface water flooding appropriate measures will be embedded into the design.			
C-74	All sub-surface infrastructure will be designed to retain sub-surface flow pathways to avoid any localised increases in groundwater flooding.	Scoping - updated at PEIR	**Draft DCO**, Schedule 1, Part 3, Requirement 22 CoCP (4) (b) **Draft DCO**, Schedule 1, Part 3, Requirement 17 (1), Requirement 18 (1)	This measure will help maintain sub-surface groundwater water flow pathways.
C-75	Construction and permanent development in flood plains will be avoided wherever possible. Where this is not possible 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	**Draft DCO**, Schedule 1, Part 3, Requirement 22 CoCP	This measure will ensure a sequential approach to development is taken and the Exception Test is passed where necessary.

ID	Environmental measure proposed	Project phase measure introduced	How the environmental measures will be secured	Relevance to water environment assessment
C-76	In line with good practice, Pollution Prevention Plans (PPPs) will be developed to detail how ground and surface waters will be protected from construction and operation related pollution. These will include information on the use and storage of any fuels, oils and other chemicals (in line with C-8 and C-167), measures for protecting licenced and private groundwater abstractions (in line with commitment C-147) and pollution incidence response planning.	Scoping - updated at PEIR	**Draft DCO**, Schedule 1, Part 3, Requirement 22 CoCP (4) (i) **Draft DCO**, Schedule 1, Part 3, Requirement 27 and 28 Operations phase maintenance (2) (a)	This measure will minimise the potential for accidental contamination entering watercourses, or groundwater.
C-77	Dewatering of excavations will be undertaken in line with good practise. Effects of dewatering on potential receptors will be incorporated into the proposed approaches for each piece of infrastructure. Appropriate treatment will be installed before discharge to surface or groundwater, this will include the use of siltbusters (or similar) before discharge to surface waters. Appropriate licences and permits will be applied for if required.	Scoping	The Environmental Permitting (England and Wales) Regulations 2016 **Draft DCO**, Schedule 1, Part 3, Requirement 22 CoCP (4) (k)	This measure will help minimise a decline in groundwater levels and an increase in flow within watercourses.

ID	Environmental measure proposed	Project phase measure introduced	How the environmental measures will be secured	Relevance to water environment assessment
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	**Draft DCO**, Schedule 1, Part 3, Requirement 22 CoCP (4) (b)	This measure will help minimise potential effects on the quantity and quality of all abstractions.
C-117	Works on areas identified as floodplain (Flood Zones 2 and 3) will be programmed to avoid the period between October and February inclusive to avoid disturbance of waterbirds, and where possible, will be programmed to occur in late summer/ early autumn, to avoid interaction with known flooding periods to minimise the potential for displacement of floodwater.	PEIR	**Draft DCO**, Schedule 1, Part 3, Requirement 22 CoCP (4) (f)	This measure will avoid interaction with known flooding periods to minimise the potential for displacement of floodwater.
C-118	Emergency Response Plans (ERPs) for flood events will be prepared for all construction activities, working areas, access and egress routes in floodplain areas (tidal and fluvial).	PEIR	**Draft DCO**, Schedule 1, Part 3, Requirement 22 CoCP (4) (i)	This measure will minimise the risk to construction staff working within the floodplain. It will also minimise the risk of silt / contaminants entering watercourses.

ID	Environmental measure proposed	Project phase measure introduced	How the environmental measures will be secured	Relevance to water environment assessment
C-119	In the fluvial floodplain, temporary trackway (rather than raised stone roads) will be considered for the temporary haul road and access routes wherever practicable.	PEIR – updated at ES	**Draft DCO**, Schedule 1, Part 3, Requirement 22 CoCP (4)	These measures will minimise the potential for displacement of floodwater and changes in surface water flow pathways.
C-120	Stone access routes / haul road and working areas will be constructed of semi-permeable aggregate material (similar to compounds as per C-129) where practical.	PEIR	**Draft DCO**, Schedule 1, Part 3, Requirement 22 CoCP (4)	
C-121	Run-off from access routes / haul road and working areas will be allowed to infiltrate wherever possible.	PEIR	**Draft DCO**, Schedule 1, Part 3, Requirement 22 CoCP (4)	
C-122	All permanent cable crossings will pass beneath the bed of watercourses (there will be 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.	PEIR	**Draft DCO**, Schedule 1, Part 3, Requirement 23 Onshore construction method statement (2) (e)	This measure will minimise changes in watercourse conveyance and morphology.
C-123	Starter (and exit) pits for Horizontal Directional Drilling (HDD) and other trenchless technologies will be micro-	PEIR	**Draft DCO**, Schedule 1, Part 3, Requirement 22 CoCP (4)	These measures will minimise volumetric displacement of flood

ID	Environmental measure proposed	Project phase measure introduced	How the environmental measures will be secured	Relevance to water environment assessment
	sited outside of the floodplain where possible (by moving the pits further away from watercourses).			water and protect the construction staff.
C-124	Where start and / or exit pits for Horizontal Directional Drilling (HDD) and other trenchless technologies are located within in the floodplain the Contractor will develop procedures as part of the Emergency Response Plan (ERP) to be enacted.	PEIR	**Draft DCO**, Schedule 1, Part 3, Requirement 22 CoCP (4) (i)	
C-125	Where the cable route crosses an Environment Agency flood defence, trenchless methodologies will be used.	PEIR	**Draft DCO**, Schedule 1, Part 3, Requirement 22 CoCP (4) (p)	This measure will help minimise volumetric displacement of floodwater (by maintaining the structural integrity of the existing flood defences).
C-126	Minor watercourses (where open cut techniques are proposed for the permanent cable crossings) will also have temporary crossings for the haul road to provide vehicular access along the route. A mixture of culverts and / or clear span bridges could be employed based on crossing specific	PEIR	The Environmental Permitting (England and Wales) Regulations 2016 Draft Development Consent Order, Schedule 1, Part 3, Requirement 22 CoCP (4) (p)	These measures will minimise the potential for silt laden / contaminated runoff entering watercourses, and changes in watercourse morphology and conveyance.

ID	Environmental measure proposed	Project phase measure introduced	How the environmental measures will be secured	Relevance to water environment assessment
	requirements (size of watercourse and flood risk). These will be subject to permits and consents with the Environment Agency and Lead Local Flood Authority (LLFA).			
C-127	Temporary watercourse crossings will not be provided for the haul road where the cable crossing will be trenchless. Vehicular access will use existing public highways and bridges.	PEIR	**Draft DCO**, Schedule 1, Part 3, Requirement 22 (4)	
C-128	Any temporary crossings will be in place for the minimal time possible.	PEIR	**Draft DCO**, Schedule 1, Part 3, Requirement 22 CoCP (4)	
C-129	Temporary construction compounds will be surfaced with semi-permeable aggregate material (similar to access roads as per C-120) where practical, with the exception of fuel storage areas and similar where pollution containment in the event of a spillage is the priority. Areas of temporary construction compounds that are used for fuel storage, plant maintenance and refuelling will be surfaced with fully impermeable materials to prevent any	PEIR	**Draft DCO**, Schedule 1, Part 3, Requirement 22 CoCP (4) (j)	This measure will help minimise changes to flow rates / pathways, and the potential for accidental contamination entering watercourses or groundwater.

ID	Environmental measure proposed	Project phase measure introduced	How the environmental measures will be secured	Relevance to water environment assessment
	infiltration of contaminated runoff and contain bunding in line with C-8 and C-167.			
C-130	During construction, no soil stockpiles will be stored within 8m of Ordinary Watercourses, within 8m of a non-tidal Main River, or within 16m of a tidal Main River.	PEIR	**Draft DCO**, Schedule 1, Part 3, Requirement 22 CoCP (4) (e) and (j)	This measure will minimise the potential for silt laden runoff entering watercourses.
C-131	Where potential flood risk receptors could be impacted by a loss of floodplain storage and / or impacts on floodplain conveyance, the loss will be addressed through soil stockpiles (associated with both the cable construction and the temporary haul road) being located outside of the fluvial floodplain.	PEIR – updated at ES	**Draft DCO**, Schedule 1, Part 1 The Authorised Development, Works No. 11 **Draft DCO**, Schedule 1, Part 3, Requirement 22 CoCP (4) (e)	These measures will help minimise the potential for displacement of flood water.
C-132	Soil stockpiles in the tidal floodplain will have regular gaps to prevent floodplain compartmentalisation. Soil stockpiles would have a maximum bund to gap ratio of 4:1. The worst case scenario for a continuous length of embankment would be up to 80m, i.e., with 20m gaps at 80m intervals.	PEIR	**Draft DCO**, Schedule 1, Part 3, Requirement 22 CoCP (4) (b) and (e)	

ID	Environmental measure proposed	Project phase measure introduced	How the environmental measures will be secured	Relevance to water environment assessment
C-133	Stockpiles will be present for the shortest practicable timeframe, with stockpiles being reinstated as the construction work progresses in order to minimise areas of exposed soil and any associated silt laden run-off. Topsoil stockpiles which remain present for six months or longer will be seeded as soon as practicable to encourage stabilisation, except where the existing seed bank is to be used in reinstatement.	PEIR	**Draft DCO**, Schedule 1, Part 3, Requirement 22 CoCP (4) (e)	This measure will help minimise the potential for silt laden runoff entering watercourses.
C-134	During construction, dewatering activities (of excavations) will be halted if a flood alert or flood warning is in place downstream, in order to minimise any impacts on flood flow conveyance and to maintain access for watercourse maintenance.	PEIR	**Draft DCO**, Schedule 1, Part 3, Requirement 22 CoCP (4) (i)	This measure will help minimise any impacts on watercourse conveyance.
C-135	A stand-off distance of at least 3m (with greater distances implemented, based on local biodiversity and pollution control considerations) will be applied from watercourse bank tops (other than for watercourse crossings) to account for potential issues such as	PEIR	**Draft DCO**, Schedule 1, Part 3, Requirement 22 CoCP (4) (f)	This measure will help minimise the potential for silt laden runoff entering watercourses (to avoid knock-on impacts on terrestrial ecology receptors).

ID	Environmental measure proposed	Project phase measure introduced	How the environmental measures will be secured	Relevance to water environment assessment
	water vole burrows, otter holts and pollution control.			
C-137	All proposed onshore infrastructure and construction activities will be sited outside of the inner Source Protection Zone 1 (SPZ1) for the Southern Water public water supplies. The only exceptions to this will be for light 4 X 4 construction access route which crosses part of Warningcamp SPZ1 and the installation of several minor passing places within the Patching SPZ1. Access routes will utilise existing tracks, roads, farm entrances etc as far as practicable, and where necessary no-dig solutions (for example, aluminium trackway) and other site specific measures (for example, C-250 and C-251) would also be utilised. There will be no storage of hazardous materials including chemicals, oils and fuels within any SPZ.	PEIR updated at ES	**Draft DCO**, Schedule 1, Part 3, Requirement 22 CoCP (4) (j)	This measure will help minimise the potential for effects on any public water supplies including Angmering and Patching boreholes.

ID	Environmental measure proposed	Project phase measure introduced	How the environmental measures will be secured	Relevance to water environment assessment
C-138	Details of the proposed trenchless watercourse crossing techniques will be discussed with the Environment Agency at the detailed design stage. The depth of the trenchless crossing will be such that the riverbed and watercourse is undisturbed by construction activities. Specific construction method statements will be prepared.	PEIR	**Draft DCO**, Schedule 1, Part 3, Requirement 23 Onshore construction method statement (2) (g)	This measure will minimise the potential for accidental contamination entering watercourses or groundwater.
C-139	Culverting activities and onshore construction of cable circuit crossings will take place during periods of normal to low flow conditions to avoid conveyance-related flood risk effects.	PEIR	**Draft DCO**, Schedule 1, Part 3, Requirement 22 CoCP (4)	This measure will minimise the potential for changes in watercourse conveyance.
C-140	Temporary cut-off drains will be installed to prevent surface water and shallow groundwater ingress into excavations. Intercepted water will be encouraged to infiltrate into the ground, mimicking natural flow patterns in accordance with the principles of SuDS. Where discharge of cut-off drains to watercourses is the only practical option, appropriate measures will be employed to moderate runoff	PEIR	**Draft DCO**, Schedule 1, Part 3, Requirement 22 CoCP (4) (k)	This measure will help minimise the potential for changes in runoff rates / pathways and groundwater levels.

ID	Environmental measure proposed	Project phase measure introduced	How the environmental measures will be secured	Relevance to water environment assessment
	rates, and promote settlement of suspended sediment.			
C-141	Dewatering of trench excavations will be carefully monitored and groundwater flow disruption and drawdown will be minimised via good construction practices. The time any excavation is open will be kept to a minimum to minimise ingress of water and dewatering requirements.	PEIR	**Draft DCO**, Schedule 1, Part 3, Requirement 22 CoCP (4) (k)	This measure will help minimise a decline in groundwater levels and an increase in flow within watercourses.
C-142	If water being pumped from excavations is suspected to be contaminated, appropriate measures will be taken in accordance with Environment Agency guidance and the Environmental Permitting Regulations to prevent uncontrolled or unauthorised releases of this water to ground or to the water environment.	PEIR	**Draft DCO**, Schedule 1, Part 3, Requirement 22 CoCP (4) (k) The Environmental Permitting (England and Wales) Regulations 2016	These measures will help minimise the potential for contaminated runoff to enter watercourses or groundwater.

ID	Environmental measure proposed	Project phase measure introduced	How the environmental measures will be secured	Relevance to water environment assessment
C-143	Any temporary onsite storage of excavated materials suspected or confirmed to be contaminated will be on impermeable sheeting, covered over and with adequate leachate / runoff drainage to prevent migration of contaminants from the stockpile. Materials will be segregated where possible to prevent cross-contamination occurring. Such materials will only be reused if they are confirmed as suitable for use in line with the requirements of the Outline Materials Management Plan (C-69).	PEIR	**Draft DCO**, Schedule 1, Part 3, Requirement 22 CoCP (4) (c), (e)	
C-144	In areas where there are groundwater seepages / flush zones identified along the access tracks at the detailed design stage, the Contractor will utilise geotextiles beneath the track material or bog-mat where necessary to prevent the track from settling into the ground to help maintain sub-surface flow.	PEIR	Draft DCO, Schedule 1, Part 3, Requirement 22 CoCP (4) (k)	This measure will help minimise changes to the sub-surface groundwater flow regime.
C-145	To enable access during construction, temporary clear span bridges will be used for those temporary watercourse	PEIR	**Draft DCO**, Schedule 1, Part 3, Requirement 22 CoCP (4) (p),	This measure will help minimise the potential for changes to watercourse conveyance.

ID	Environmental measure proposed	Project phase measure introduced	How the environmental measures will be secured	Relevance to water environment assessment
	crossings too wide or deep to be crossed using culverts.			
C-146	The location of statutory undertaker assets (including water supply and sewer pipes, water and waste treatment works etc.) will be confirmed through inspection of detailed plans from the undertakers. All assets potentially affected by the Proposed Development will be identified, with particular consideration to access roads and crossings.	PEIR	**Draft DCO**, Schedule 1, Part 3, Requirement 23 Onshore construction method statement (1)	This measure will help minimise the potential for disruption to existing water supply, sewerage and discharge infrastructure.
C-147	The Contractor will identify springs, abstractions and any sewerage infrastructure including treatment plants, septic tanks, soakaways, interconnecting pipes and outfalls, that require appropriate protection. These features will be mapped and appropriate exclusion zones will be applied to ensure that construction methods do not disturb the physical infrastructure layout. All appointed Contractor staff will be given training to protect abstractions deemed to be at risk. In the event that an abstraction is	PEIR	**Draft DCO**, Schedule 1, Part 3, Requirement 22 CoCP (4) (o)	This measure will help minimise the potential for impacts on existing abstractions, sewerage or discharge infrastructure.

ID	Environmental measure proposed	Project phase measure introduced	How the environmental measures will be secured	Relevance to water environment assessment
	identified as being at risk of water quality deterioration, a comprehensive sampling programme will be agreed with the relevant authority for the abstraction in question. Furthermore in the event that there is an impact on a water supply, an alternative supply will be made available.			
C-148	During construction, a programme of visual inspections will be undertaken to ensure that the potential effects on the River Arun and Adur tributaries are appropriately monitored. The visual inspection points will be selected downstream of construction areas. See C-151 for the response plan in the event that observations identify that an intervention is necessary.	PEIR	**Draft DCO**, Schedule 1, Part 3, Requirement 22 CoCP (4) (o)	This measure will help ensure that any potential silt laden runoff is appropriately monitored and controlled.
C-149	In areas where there is a potential for hydrocarbon residues from run-off / isolated leakages, surface water drainage measures will be provided to capture hydrocarbons prior to discharge, such as hydrocarbon interceptors.	PEIR	**Draft DCO**, Schedule 1, Part 3, Requirement 22 CoCP (4) (j)	These measures will help minimise the potential for accidental contamination entering watercourses or groundwater.

ID	Environmental measure proposed	Project phase measure introduced	How the environmental measures will be secured	Relevance to water environment assessment
C-150	Plant and machinery used during the construction and operation phases will be maintained to minimise the risks of oils leaks or similar, in line with C-8. Placing a drip tray beneath a plant and machinery during refuelling and the availability of spill kits will contain small spillages.	PEIR	**Draft DCO**, Schedule 1, Part 3, Requirement 27 and 28 Operations phase maintenance (2) (a) **Draft DCO**, Schedule 1, Part 3, Requirement 22 CoCP (4) (j)	
C-151	Contractors will be made aware of their statutory responsibility not to “cause or knowingly permit water pollution.” A Pollution Prevention Plan (PPP) and Pollution Incident Response Plan (PIRP) will be prepared for the Proposed Development, the latter in line with Pollution Prevention Guideline 21 (PPG 21, 2009), and all contractors will be briefed on these plans, with copies made available on site.	PEIR	**Draft DCO**, Schedule 1, Part 3, Requirement 22 CoCP (4) (j)	
C-152	In the event that piling is selected for installation of the onshore substation foundations, a detailed piling risk assessment will be developed. This will be submitted to the Environment Agency for approval, prior to the commencement of construction.	PEIR	**Draft DCO**, Schedule 1, Part 3, Requirement 22 CoCP (4) (k)	This measure will help minimise the potential for contamination of groundwater.

ID	Environmental measure proposed	Project phase measure introduced	How the environmental measures will be secured	Relevance to water environment assessment
C-153	An Operations and Maintenance Plan will be developed prior to commissioning of the Proposed Development with a Pollution Incident Control Plan (PICP) for implementation during the operation and maintenance phase.	PEIR	**Draft DCO**, Schedule 1, Part 3, Requirement 27 and 28 Operations phase maintenance (2) (b)	This measure will help minimise the potential for accidental contamination entering watercourses or groundwater.
C-154	Within the fluvial floodplain and at surface water flow pathways, the permanent cable will be completely buried, with the land above reinstated to pre-construction ground level (some mounding may be appropriate to allow for settlement).	PEIR	**Draft DCO**, Schedule 1, Part 3, Requirement 22 CoCP (4) (b)	This measure will help minimise the potential for displacement of flood water or changes in runoff pathways.
C-167	Any tanks and associated pipe work containing oils, fuels and chemicals will be double skinned and provided with leak detection equipment. There will be a bunded capacity of 100% of the maximum tank volume for non-hazardous fluids. For hazardous chemicals, fuels or oils bund capacity will be the larger of 110% of the largest tank volume for single tank bunds, (or, in the case of multi tank bunds, 110% of the largest tank capacity or 25% of	PEIR	**Draft DCO**, Schedule 1, Part 3, Requirement 22 CoCP (4) (j) Requirement 8 Detailed design approval onshore substation (2), Requirement 9 Detailed design approval – extension to National Grid substation (2)	This measure will help minimise the potential for accidental contamination entering watercourses or groundwater.

ID	Environmental measure proposed	Project phase measure introduced	How the environmental measures will be secured	Relevance to water environment assessment
	the combined tank capacity, whichever it is the largest). Fuel storage will be in accordance with the Control of Pollution (Oil Storage) (England) Regulations 2001 and other Pollution Prevention Guidelines (PPGs). All stores of fuel will be located at least 20m from any watercourses and away from areas at risk of flooding.			
C-175	Where use of trackway is not possible and potential flood risk receptors could be impacted, access routes (and working areas) in the fluvial floodplain will be as close to ground level as possible to avoid impacting flood flow conveyance and loss of floodplain storage (a slight raised surface is often required to allow for drainage).	PEIR	**Draft DCO**, Schedule 1, Part 3, Requirement 22 CoCP (4)	This measure will help minimise the potential for displacement of flood waters or changes in watercourse conveyance.
C-176	For temporary watercourse crossings, where culverts are to be used, these will be appropriately sized to maintain existing flow conveyance. Where existing culverts already exist nearby, similarly sized culverts may be suitable.	PEIR	**Draft DCO**, Schedule 1, Part 3, Requirement 22 CoCP (4)	These measures will help maintain watercourse conveyance.

ID	Environmental measure proposed	Project phase measure introduced	How the environmental measures will be secured	Relevance to water environment assessment
C-177	Where feasible, multiple pipes will not be used for culverts of temporary watercourse crossings (culverts should have a single pipe / opening of an appropriate size for the watercourse cross section).	PEIR	**Draft DCO**, Schedule 1, Part 3, Requirement 22 CoCP (4)	
C-178	Circular culverts for temporary watercourse crossings will have concrete bedding in locations where ground conditions suggest that settlement could occur, for example, Arun Internal Drainage Board (IDB) district.	PEIR	**Draft DCO**, Schedule 1, Part 3, Requirement 22 CoCP (4)	
C-179	Stockpile gaps will be located at topographic low points to preserve existing flow paths.	PEIR	**Draft DCO**, Schedule 1, Part 3, Requirement 22 CoCP (4) (b) and (e)	These measures will help minimise changes to surface flow pathways.
C-180	Where stockpiles are placed on both sides of the access routes / haul road the gaps will coincide.	PEIR	**Draft DCO**, Schedule 1, Part 3, Requirement 22 CoCP (4) (b) and (e)	
C-181	Access roads will have cross drainage provided where necessary at topographic low points.	PEIR	**Draft DCO**, Schedule 1, Part 3, Requirement 22 CoCP (4) (b)	

ID	Environmental measure proposed	Project phase measure introduced	How the environmental measures will be secured	Relevance to water environment assessment
C-182	Any works within 5m of any watercourse in the Internal Drainage Board (IDB) district will be subject to consent from the Environment Agency. Any works within 8m of a non-tidal Main River or 16m for a tidal Main River will be subject to consent from the Environment Agency (the majority of the Main Rivers are tidal for the majority of the cable route). Work within banktop of any other watercourse (not main river and outside of IDB) would require consent from the Lead Local Flood Authority (LLFA).	PEIR	The Environmental Permitting (England and Wales) Regulations 2016 **Draft DCO**, Schedule 1, Part 3, Requirement 22 CoCP (4) (b)	This measure will help minimise any impacts to watercourse conveyance, and on silt laden runoff entering watercourses.
C-184	The Contractor(s) for construction, operation and decommissioning will use a short to medium range weather forecasting service from the Met Office, or other approved meteorological data and weather forecast provider, to inform short to medium-term programme management of activities, including implementation of necessary environmental control and / or impact mitigation measures with respect to climate conditions and extreme	PEIR	**Outline CoCP** (Document Reference: 7.2) and DCO requirement.	This measure will help minimise potential flood risk impacts towards the Contractor and other third party receptors.

ID	Environmental measure proposed	Project phase measure introduced	How the environmental measures will be secured	Relevance to water environment assessment
	weather events. The Contractor(s) will register with the Environment Agency's flood warning service in areas of flood risk. The Contractor(s) will use this information to ensure that relevant measures, including those within the Code of Construction Practice and an Environmental Management System (EMS), are implemented and, as appropriate, consider additional measures to ensure the resilience of the programme during extreme weather events.			
C-227	Techniques will be employed by the contractor to manage the risk of drilling fluid breakout or losses into the deposits or strata surrounding the HDD bore. Drilling fluids will be used to seal permeable deposits or strata. The naturally occurring bentonite clay will be used as the base for the drilling fluid, which will line the bore wall, preventing fluid loss and near-surface groundwater ingress.	ES	**Draft DCO**, Schedule 1, Part 3, Requirement 22 CoCP (4) (j)	This measure will help minimise the potential for accidental contamination from drilling fluids entering watercourses or groundwater and impacts on water resources.

ID	Environmental measure proposed	Project phase measure introduced	How the environmental measures will be secured	Relevance to water environment assessment
C-229	Crossings of South Downs National Park Authority (SDNPA) designated Chalk streams will be designed to be less intrusive, for example by using a clear span bridge instead of a culvert to support the haul road or via use of trenchless crossing techniques. Open cut cable crossings will be constructed and reinstated in as short a timeframe as practicable. Details of the cable crossing methodologies at each watercourse can be found within Appendix A - Crossing Schedule of the Outline Code of Construction Practice.	ES	**Draft DCO**, Schedule 1, Part 3, Requirement 22 CoCP (4) (p)	This measure will help minimise any impacts to the morphological condition and water quality of Chalk streams.
C-230	The substation design will adhere to the National Grid target guidance for flood protection / resilience for new substations, which is for flood resilience to the 0.1 percent AEP (1 in 1,000) event plus climate change, plus a further 300mm.	ES	**Draft DCO**, Schedule 1, Part 3, Requirement 8 Detailed design approval onshore substation (2), Requirement 9 Detailed design approval – extension to National Grid substation (2)	This measure will help increase the flood resilience of the onshore substation and help minimise any flood risk impacts towards other third parties.
C-234	Techniques will be employed by the contractor to manage the risk of drilling fluid breakout or losses into the	ES	**Draft DCO**, Schedule 1, Part 3, Requirement 22 CoCP (4) (j),	This measure will help minimise the potential for accidental contamination

ID	Environmental measure proposed	Project phase measure introduced	How the environmental measures will be secured	Relevance to water environment assessment
	deposits or strata surrounding trenchless crossings (including HDD bores). The risk of breakouts can be mitigated by adopting good drilling practices, including: 1. Experienced drillers 2. Standard process and procedures for drilling, data collection and communication 3. Appropriate drill fluid monitoring (fluid properties, volume/flow and downhole pressure) 4. Development of a breakout response plan, so that equipment and trained personnel are in place for a rapid response; and 5. Acquisition of rights-of-way or easements for at least the first 60m from both the entry and exit holes so that no access-related delays are incurred in response to any breakouts.		Requirement 23 Onshore construction method statement (2) (a)	from drilling fluids entering watercourses or groundwater and impacts on water resources.

ID	Environmental measure proposed	Project phase measure introduced	How the environmental measures will be secured	Relevance to water environment assessment
C-235	Best practice techniques and methodologies will be undertaken during the implementation of HDD works. The HDD works are to be undertaken in accordance with Pipeline Design for Installation of Horizontal directional drilling (Manual of Practice) by ASCE Oct 2014 or similar.	ES	**Draft DCO**, Schedule 1, Part 3, Requirement 22 CoCP (4) (j), Requirement 23 Onshore construction method statement (2) (a)	This measure will help minimise the potential for accidental contamination from drilling fluids entering watercourses or groundwater and impacts on water resources.
C-236	For trenchless crossings detailed pre-drilling planning of methods and processes will be undertaken. The extensive pre-drill planning will include the compilation of potential sub-surface structures along the alignment, environmental due diligence of the sites of the entry and exit holes, a geotechnical investigation along the proposed alignment to determine geological conditions with an emphasis on identifying sensitive areas and problematic ground conditions, and the analytical analysis of fluid pressures versus depth of cover to determine adequate depths of cover to minimise breakouts.	ES	**Draft DCO**, Schedule 1, Part 3, Requirement 22 CoCP (4) (j) **Draft DCO**, Schedule 1, Part 3, Requirement 23 Construction method statement (2) (a), (e)	This measure will help minimise the potential for accidental contamination from drilling fluids entering watercourses or groundwater and impacts on water resources.

ID	Environmental measure proposed	Project phase measure introduced	How the environmental measures will be secured	Relevance to water environment assessment
C-241	During HDD activities, the drilling fluid engineer will carefully monitor the fluid usage in the recycling system and will quickly identify if fluid is being lost into the strata. If fluid loss is identified there are a number of measures that can be taken to seal the bore, including the following: 1. Modifying the drilling fluid properties to increase the effectiveness of the bentonite clay filter cake that lines the wall of the borehole; 2. Standard process and procedures in place for drilling, data collection and communication; 3. Appropriate drill fluid monitoring (fluid properties, fluid volume and flow, and downhole annular pressure); 4. Addition of stop-loss materials to bridge and seal larger voids in the soil; and 5. Modifying the mud weight (drilling fluid density) to either balance or counter the groundwater pressure depending on ground conditions.	ES	**Draft DCO**, Schedule 1, Part 3, Requirement 22 CoCP (4) (j) **Draft DCO**, Schedule 1, Part 3, Requirement 23 Onshore construction method statement (2) (a)	This measure will help minimise the potential for accidental contamination from drilling fluids entering watercourses or groundwater and impacts on water resources.

ID	Environmental measure proposed	Project phase measure introduced	How the environmental measures will be secured	Relevance to water environment assessment
C-245	Environmentally hazardous drilling fluids, or those containing groundwater hazardous substances, will not be used during trenchless crossings (including HDD).	ES	**Draft DCO**, Schedule 1, Part 3, Requirement 22 CoCP (4) (j)	This measure will minimise potential for contamination towards groundwater receptors.
C-246	A watching brief will be carried out by the appointed Contractor and their Environmental Clerk of Works to monitor the drilling of the trenchless crossing (TC-11) and the excavation of trenches along a targeted part of the cable route which is in closest proximity to karstic solution features between Hammerpot and 'The Buckmans' (TC-12a) (Chainage 9.3km to 11.7 km). The watching brief will be carried out to identify sensitive areas and ground conditions (swelling clays, transition zones, preferential pathways for breakouts) in order to provide any evidence of karstic solution features within the cable corridor at this location. In the event that any solution features are identified then micro-siting of the route would be carried out to avoid such features.	ES	**Draft DCO**, Schedule 1, Part 3, Requirement 22 CoCP (4) (j)	This measure will help minimise the potential for contamination towards Angmering public water supply and PWSs.

ID	Environmental measure proposed	Project phase measure introduced	How the environmental measures will be secured	Relevance to water environment assessment
C-247	RED will undertake ground investigation at the landfall site at the post-DCO application stage. This would be carried out to inform the exact siting and detailed design of the Transition Joint Bay and associated apparatus. In addition, this would inform a 'coastal erosion and future beach profile estimation assessment', which in turn would inform the need for and design of any further mitigation and adaptive measures to help minimise the vulnerability of these assets from future coastal erosion and tidal flooding.	ES	**Draft DCO**, Schedule 1, Part 3, Requirement 26 Coastal erosion (1), (2)	This measure will help increase the flood resilience of the landfall from coastal erosion and tidal flooding.
C-250	The construction of the passing place upgrades along Michelgrove Lane will be programmed for Spring – Autumn (April – November) when groundwater levels in this area are typically lower.	ES	**Draft DCO**, Schedule 1, Part 3, Requirement 22 CoCP (4) (j)	This measure will help minimise the potential for contamination towards Patching public water supply and PWSs.
C-251	Prior to the commencement of the construction of the passing places along Michelgrove Lane, these works areas will be visually checked to confirm that there is no karst solution features.	ES	**Draft DCO**, Schedule 1, Part 3, Requirement 22 CoCP (4) (j)	This measure will help minimise the potential for contamination towards Patching public water supply and PWSs.

ID	Environmental measure proposed	Project phase measure introduced	How the environmental measures will be secured	Relevance to water environment assessment
C-252	Where the light construction access track (A-28) overlaps with part of an ephemeral pond near Cobden Farm, ground protection measures for accesses and haul routes and cross drainage will be considered to help minimise any potential interruption to flow pathways.	ES	**Draft DCO**, Schedule 1, Part 3, Requirement 22 CoCP (4) (b)	This measure will help minimise potential impacts on the water quantity / quality on this feature.
C-253	A water quality monitoring programme will be carried out at private water supplies in proximity of the Order Limits, for instance at Brookbarn Farm, Suzy Smith Racing / Angmering Park Estate and Michelgrove for an appropriate period prior to during and post construction of the cable route. Further details of the monitoring regime will be discussed and agreed with ADC at the post DCO stage.	ES	**Draft DCO**, Schedule 1, Part 3, Requirement 22 CoCP (4) (o)	This measure will help minimise the potential for contamination towards PWSs.
C-260	Strategies to minimise water use, such as water harvesting or recycling, will be employed at the onshore substation, to be specified at the detailed design stage. Any residual negligible water use will be further mitigated as part of a	ES	**Draft DCO**, Schedule 1, Part 3, Requirement 8 Detailed design approval onshore substation (2)	This measure will help minimise water usage at the onshore substation.

ID	Environmental measure proposed	Project phase measure introduced	How the environmental measures will be secured	Relevance to water environment assessment
	multitiered approach to achieve water neutrality.			
C-292	During detailed design the mitigation hierarchy will be applied to avoid losses of key habitats (e.g. woodland, hedgerows, scrub, watercourses and semi-improved grassland) where possible, and where not to minimise losses and mitigate for them. At each crossing of sensitive habitats the Ecological Clerk of Works will provide advice to the design engineers with justification of approach provided. The approach at individual crossings will be detailed in the relevant stage specific Vegetation Retention and Removal Plan	Examination	Draft Development Consent Order, Schedule 1, Part 3, Requirement 22 Code of construction practice (4) (f) Draft Development Consent Order, Schedule 1, Part 3, Requirement 40 Vegetation Retention and Removal	To help minimise and avoid potential impacts on water dependent ecosystems and features.
C-293	RED will consult with the Lead Local Flood Authority and undertake ground investigation at the Oakendene substation site at the detailed design stage, including groundwater monitoring in at least one appropriate location in close proximity to the watercourse to the south of the site, for one winter period (September to April).	Examination	Draft Development Consent Order, Schedule 1, Part 3, Requirement 8 (2) Detailed design approval onshore substation Draft Development Consent Order,	This measure will help inform an appropriate final operational drainage plan at the onshore substation at Oakendene which in turn will help minimise any potential flood risk impacts

ID	Environmental measure proposed	Project phase measure introduced	How the environmental measures will be secured	Relevance to water environment assessment
	This would be carried out to inform the detailed design of the Oakendene substation, including design of the drainage system and its associated landscaping and planting measures		Schedule 1, Part 3, Requirement 17 Operational Drainage Management	towards other third parties.

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26.7.10 Further detail on the environmental measures in **Table 26-20** is provided in the **Commitments Register** (Document Reference: 7.22) which sets out how and where particular environmental measures will be implemented and secured.

Water neutrality commitment

26.7.11 As noted earlier under **Section 26.3**, WSCC has requested that a water neutrality statement is undertaken for the Proposed Development. The following steps have been set out to ensure that Rampion 2 would align accordingly with available neutrality guidelines (HDC, 2023) (WSCC, 2023):

i. Mitigation by design: the Proposed Development has been appropriately designed to help minimise the local water usage on-site. The operational water demand of the Proposed Development would be negligible, on the basis that the onshore substation will be unstaffed and the only activities which will be connected to the mains water supply will be welfare facilities (for example, toilets and a sink) which will be used rarely, and fire control which would only be used during unlikely emergency events.

ii. Embedded measure: An embedded environmental measure has also been included for water harvesting and recycling systems at the onshore substation (C-260) (see **Table 26-20**) in order to further minimise the negligible operational water usage at that location.

iii. Other mitigation: If at this stage, further mitigation is required, a variety of options would be available to RED to ensure water neutrality. This could include, but not be limited to, options such as:

- making use of a strategic scheme (e.g. Sussex North Offsetting Water Scheme) (endorsed by Natural England) if access to such a scheme were available. This is currently in development (with a dedicated local authority delegate), to help improve the efficiency of appliances/devices elsewhere in the water supply zone to help reduce regional water use. It is highly likely that this scheme would be in place prior to the substation being connected into the mains. In the absence of this being available on time, a private scheme would be considered by the applicant to help reduce water usage elsewhere; and
- not drawing water from a mains source (through off site water imports / exports sourced from outside of the Sussex North water supply zone), for instance the use of water bowsers for use at welfare facilities on site.

26.7.12 These mitigations are secured by a DCO requirement, so that further work can be progressed once the detailed design of the substation has been developed, and the strategic scheme established.

26.7.13 On the basis of the successful implementation of some of the above measures, the water use footprint would be neutralised. This information has been taken into account within the **Report to Inform Appropriate Assessment** (Document Reference: 5.9) which contains the relevant assessments for conservation sites.

26.8 Methodology for ES assessment

Introduction

26.8.1 The assessment methodology for the water environment for the ES is consistent with that provided in the Scoping Report (RED, 2020). The project-wide generic approach to assessment is set out in **Chapter 5: Approach to the EIA, Volume 2** of the ES (Document Reference: 6.2.5), and whilst this has informed the approach that has been used in this water environment section, it is necessary to set out how this methodology will be applied, and adapted as appropriate, to address the specific needs of the water environment assessment.

Significance evaluation methodology

Overview

26.8.2 The significance level attributed to each effect will be assessed based on the value of the affected receptor and the magnitude of change resulting from the Proposed Development. The level of significance is then determined by the combination of value and magnitude.

26.8.3 Value is assessed on a scale of high, medium, low and very low, whilst magnitude is assessed on a scale of high, medium, low and negligible. The criteria for defining value and magnitude can be found in **Table 26-21** and **Table 26-23** respectively, along with example applications. These criteria are defined and applied based on professional judgement, using recognised approaches to classification relevant to the receptor types, including the WFD (Environment Agency, 2017b), the NPPF (MHCLG, 2021) and Design Manual for Roads and Bridges (DMRB (Highways England, 2021)), all of which represent good practice for water environment assessment within the EIA.

Value of receptor

26.8.4 Definitions of receptor value used in the assessment are provided in **Table 26-21** with examples of receptors placed in each class.

Table 26-21 Definitions of receptor value

Value	Criteria	Examples
High	Features with a high yield, quality or rarity, with little potential for substitution.	Conditions supporting a site with an international conservation designation (for example, Special Area of Conservation (SAC), Special Protection Area (SPA), Ramsar site), where the designation is based specifically on aquatic features. WFD surface water body (or part thereof) with overall 'Good' status / potential.

Value	Criteria	Examples
		WFD groundwater body (or part thereof) with overall ‘Good’ status.
	Water use supporting human health and economic activity at a regional scale.	Regionally important public surface water or groundwater supply (and associated catchment / SPZ / Groundwater Management Unit (GWMU)).
	Features with a high vulnerability to flooding.	Land use type defined as ‘Essential Infrastructure’ (for instance, critical national infrastructure, such as essential transport and utility infrastructure) and ‘Highly Vulnerable’ (for example, police / ambulance stations that are required to operate during flooding, mobile homes intended for permanent residential use) in the NPPF (MHCLG, 2021) flood risk vulnerability classification.
Medium	Features with a medium yield, quality or rarity, with a limited potential for substitution.	Conditions supporting a site with a national conservation designation (for example, SSSI, National Nature Reserve (NNR)), where the designation is based specifically on aquatic features. WFD surface water body (or part thereof) with overall Moderate or lower status / potential. WFD groundwater body (or part thereof) with overall Poor status.
	Water use supporting human health and economic activity at a local scale.	Local public surface water and groundwater supply (and associated catchment / SPZ / GWMU) or permitted discharge. Licensed non-public surface water and groundwater supply abstraction (and associated groundwater catchment / SPZ / GWMU) which is relatively large relative to available resource, or where raw water quality is a critical issue, for example: industrial process water, or permitted discharge. Unlicensed potable surface water and groundwater abstraction (and associated catchment)

Value	Criteria	Examples
	Features with a moderate vulnerability to flooding.	Land use type defined as 'More Vulnerable' in the NPPF (MHCLG, 2021) flood risk vulnerability classification (for example, hospitals and health centres, educational institutions, most types of residential development).
Low	Features with a low yield, quality or rarity, with some potential for substitution.	Conditions supporting a site with a local conservation designation (for example, LNR, County Wildlife Site (CWS)), where the designation is based specifically on aquatic features, or an undesignated but highly / moderately water-dependent site, including a LWS and a Groundwater Dependent Terrestrial Ecosystem (GWDTE). Non-reportable WFD surface water or groundwater body (or part thereof), or non-WFD water body.
	Water use supporting human health and economic activity at household / individual business scale.	Licensed non-public surface water and groundwater supply abstraction (and associated catchment / SPZ / GWMU), which is relatively small relative to available resource, or where raw water quality is not critical, for example: cooling water, spray irrigation, mineral washing or permitted discharge. Unlicensed non-potable surface water and groundwater abstraction (and associated catchment) for example, livestock supply.
	Features with a low vulnerability to flooding.	Land use type defined as 'Less Vulnerable' in the NPPF (MHCLG, 2021) flood risk vulnerability classification (for example, most types of business premises, including land and buildings used for agriculture).
Very Low	Commonplace features with very low yield or quality with good potential for substitution.	Conditions supporting an undesignated and low water-dependent site, including a LWS, GWDTE, LGS, spring and pond.
	Water use does not support human health, and of only limited economic benefit.	Unregistered, unlicensed well which is shown only on OS mapping near the proposed DCO Order Limits and considered as part of a precautionary approach.

Value	Criteria	Examples
	Features that are resilient to flooding.	Land use type defined as 'Water-compatible development' in the NPPF (MHCLG, 2021) flood risk vulnerability classification (for example: flood control infrastructure; water transmission infrastructure), and undeveloped land.

26.8.5 Based on information on baseline conditions in **Section 26.6** (informed by findings from **Appendix 26.1: Detailed water environment baseline information, Volume 4** of the ES (Document Reference: 6.4.26.1) and **Appendix 26.2: Flood Risk Assessment, Volume 4** of the ES (Document Reference: 6.4.26.2)) and the criteria from **Table 26-21**, an assessment of value is provided in **Table 26-22** for each of the identified receptors, with identifier labels assigned to licensed abstraction, PWS and discharge receptors (for example A1, P1 and D1 respectively).

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Table 26-22 Identified water environment receptors

Receptor type	Proposed DCO Order Limits	Value	Rationale
WFD Water Bodies	WFD Groundwater Bodies Littlehampton Anticline West GB40701G504900 Sussex Lambeth Group GB40701G505100 Lower Greensand Adur and Ouse GB40701G502400 Adur and Ouse Hastings Beds GB40702G502000	High	WFD groundwater bodies (or part thereof) with overall 'Good' status.
	WFD Surface Water and Groundwater Bodies Ryebank Rife GB107041006620 Black Ditch (West Sussex) GB107041012890 Littlehampton Anticline East GB40701G503400 Worthing Chalk GB40701G505300 Honeybridge Stream GB107041012120 Adur Lockbridge GB107041012200 Adur East (Sakeham) GB107041012900 Adur East, GB107041012180 Cowfold Stream GB107041012260 Arun Lower GB540704105000	Medium	WFD surface water, transitional and coastal water bodies (or part thereof) with overall Moderate or lower status / potential, and groundwater bodies (or part thereof) with overall Poor status.

Receptor type	Proposed DCO Order Limits	Value	Rationale
	Adur GB540704116000 Sussex GB640704540003		
Conservation Sites, Ponds and Springs	Designated Conservation Sites Amberly Mount to Sullington Hill SSSI	Medium	Conditions support sites with a national conservation designation, where the designation is based specifically on aquatic features.
	Undesignated Conservation Sites Bines Green LWS Chalk Streams Chalk stream headwaters of the Black Ditch south of the A27 Chalk streams near Buncton	Low	Conditions supporting sites with an undesignated but highly / moderately water-dependent site.
	LGSs, Ponds and Springs Rock Common Sand Quarry LGS Undesignated ponds near Patching (Black Ditch catchment); Washington Road A283 (River Stor catchment); Buncton Manor Farm (Honeybridge Stream catchment); between Blakes Farm and Sweethill Farm (Ordinary Watercourse tributary of the tidal Adur); near Eatons Farm (Ordinary Watercourse tributary of the tidal	Very Low	Conditions supporting undesignated and low water-dependency site.

Receptor type	Proposed DCO Order Limits	Value	Rationale
	Adur) and south-west of the existing National Grid Bolney Substation (Adur East (Sakeham) catchment. SDNPA dew ponds and other ponds including DP1, DP3, DP4, DP5, DP6, DP9, DP10, DP14, DP15, DP16, DP17, DP18, DP19, DP20. Undesignated springs near Hammerpot (Black Ditch catchment); between Kithurst Farm and Garston Farm (River Stor catchment); Water Lane, Buncton, Castle Farm Estate and Hawking Soppers (Honeybridge Stream catchment).		
Water Resources	<u>Public Water Supply Abstractions</u> A15 24/063 Warningcamp PS Borehole A20 10/41/310210 Angmering PS Point 2 A21 10/41/310210 Angmering PS Point 1 A28 10/41/310210 Patching PS A33 10/41/310210 Findon PS A35 10/41/310210 Sompting PS A36 10/41/310210 Broadwater PS Borehole 1 A37 10/41/310210 Broadwater PS Borehole 2 A38 10/41/310210 Broadwater PS Borehole 3 A39 10/41/310210 Broadwater PS Well	High	Regionally important public surface water or groundwater supply (and associated catchment / SPZ / GWMU).

Receptor type	Proposed DCO Order Limits	Value	Rationale
	A40 10/41/310210 Northbrook PS Point 2 (Sussex) A41 10/41/310210 Northbrook PS Point 1 (Sussex)		
	<u>Large Licensed Abstractions</u> A1 10/41/542009 Point A At New Barn, Climping A5 23/059 Point A St Alders Fish Farm A6 10/41/411021 River Arun – Estuary Tidal A9 24/060 Knucker Hole Fish Farm A19 10/41/414101 Lee Farm, Patching A24 24/066 Old Place Farm A27 24/068/R01 side channel of the Black Ditch at Manor Farm, Poling A46 10/41/312103 Wappingthorn Farm, Steyning Borehole A A47 10/41/312010 Huddlestone Farm, Steyning A48 10/41/312010 Huddlestone Farm, Steyning	Medium	Licensed non-public surface water and groundwater supply abstraction (and associated catchment / SPZ / GWMU) which is relatively large relative to available resource, or where raw water quality is a critical issue, for example: industrial process water, or permitted discharge.
	<u>Small Licensed Abstractions</u> A23 24/066 Old Place Farm	Low	Licensed non-public surface water and groundwater supply abstraction (and associated catchment / SPZ / GWMU),

Receptor type	Proposed DCO Order Limits	Value	Rationale
	A42 25/084 Point A, Sandgate Pit, Storrington A43 25/084 Point B, Sandgate Pit, Storrington A44 23/073 Washington Garden Centre		which is relatively small relative to available resource, or where raw water quality is not critical, for example: cooling water, spray irrigation, mineral washing or permitted discharge.
	PWSs P1 The Old Rectory P2 Brookbarn House P3 Pauls House P4 The Decoy P5 Suzy Smith Racing / Angmering Park Estate P10 The Chantry Mere P11 Wappingthorn Farm P12 Huddlestone Farm P18 Unknown P19 East College P20 Green Pastures P21 Myrtlegrove Cottage Stables P22 The Martins	Medium	Unlicensed (assumed potable) surface water and groundwater PWS abstractions.

Receptor type	Proposed DCO Order Limits	Value	Rationale
	P24 Michel Grove		
	Unregistered Mapped Wells Near Hammerpot just north of the A27 (Black ditch catchment); near Godsmark Farm (unnamed Ordinary Watercourse tributary of River Adur catchment); two between Frylands and Waterperry House along Frylands Lane (Adur East (Sakeham) catchment); the Hangers, Ewhurst Cottages, the Rectory, Park Farm and the Fodges, Kent Street (Cowfold Stream catchment).	Very Low	Unlicensed, unregistered, mapped wells considered as potential receptors as part of a precautionary approach.
	Consented Discharges D1 Discharge on the north bank of the River Arun for H M Prison (P06977); D2 Bolney Substation at Wineham Lane (S01525); D3 Old Doctors Cottage (N02970); D4 Sub-Station at Wineham Lane (S01446).	Low	Permitted discharges
Flood Risk Receptors	Essential Infrastructure Arundel Station Highly Vulnerable Land Use Brookside caravan park	High	Land use type defined as 'Essential Infrastructure' (for instance, critical national infrastructure). Land defined as 'Highly Vulnerable' (for mobile homes intended for permanent residential use)
	More Vulnerable Land Use	Medium	Land use type defined as 'More Vulnerable' in the NPPF (MHCLG, 2021) flood risk

Receptor type	Proposed DCO Order Limits	Value	Rationale
	Residential properties within Atherington; The Mill, Climping Residential and mixed-use properties on Church Lane, Lyminster Mixed-use properties on Sandhill Lane, Washington, and Springlands, Wineham		vulnerability classification (for example, most types of residential development).
	Less Vulnerable Land Use Climping Park, Priory Farm, Old Waterworks Farm, Rock Business Park, Washington, and Yokenclose Barn, Bines Green	Low	Land use type defined as 'Less Vulnerable' in the NPPF (MHCLG, 2021) flood risk vulnerability classification (for example, most types of business premises, including land and buildings used for agriculture).

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Magnitude of change

26.8.6 The magnitude of change from baseline conditions includes a consideration of the duration and reversibility of the change, and relevant legislation, policy standards and guidance. **Table 26-23** provides examples of how various magnitudes of change are determined with respect to water features.

26.8.7 Magnitude of change may be either positive or adverse. The criteria and examples in **Table 26-23** focus on adverse changes, but positive changes may also occur and will be considered on a case-by-case basis as required.

Table 26-23 Definitions of magnitude of change

Magnitude	Criteria	Examples
High	Results in complete loss or major change to feature, of sufficient magnitude to affect its use / integrity.	Deterioration in river flow regime, morphology or water quality, leading to sustained, permanent or long-term breach of relevant conservation objectives (COs) or non-temporary downgrading (deterioration) of WFD surface water body status (including downgrading of individual WFD elements), or resulting in the inability of the surface water body to attain Good status by the relevant deadline in line with the measures identified in the RBMP. Deterioration in groundwater levels, flows or water quality, leading to non-temporary downgrading of WFD groundwater body status, or the inability of the groundwater body to attain Good status in line with the measures identified in the RBMP. Complete or severely reduced water availability and/or quality, compromising the ability of water users to abstract. Change in flood risk resulting in potential loss of life or major damage to the property or infrastructure.
Medium	Results in partial loss or noticeable change to feature, of sufficient magnitude to affect its use / integrity in some circumstances.	Deterioration in river flow regime, morphology, or water quality, leading to periodic, short-term, and reversible breaches of relevant COs, or potential temporary downgrading of surface water body status (including potential temporary downgrading of individual WFD elements), although not affecting the ability of the surface water body to achieve future WFD objectives.

Magnitude	Criteria	Examples
		Deterioration in groundwater levels, flows or water quality, leading to potential temporary downgrading of WFD groundwater body status, although not affecting the ability of the groundwater body to achieve future WFD objectives. Moderate reduction in water availability and/or quality, which may compromise the ability of the water user to abstract on a temporary basis or for limited periods, with no longer-term impact on the purpose for which the water is used. Change in flood risk resulting in potential for moderate damage to the property or infrastructure.
Low	Results in minor change to feature, with insufficient magnitude to affect its use / integrity in most circumstances.	Measurable effect on river flow regime, morphology or water quality, but remaining generally within COs, and with no short-term or permanent change to WFD surface water body status (of overall status or element status). Measurable effect on groundwater levels, flows or water quality, but with no short-term or permanent downgrading of WFD groundwater body status. Minor reduction in water availability and/or quality, but unlikely to affect the ability of a water user to abstract. Change in flood risk resulting in potential for minor damage to property or infrastructure.
Negligible	Results in little or no change to feature, with insufficient magnitude to affect its use / integrity.	No measurable effect on river flow regime, morphology or water quality, and no consequences in terms of COs or surface water body status. No measurable effect on groundwater levels, flows or water quality, and no consequences in terms of WFD groundwater body status. No measurable change in water availability or quality and no change in ability of the water user to exercise licensed rights. Increased frequency of flood flows, but which does not pose an increased risk to property or infrastructure.

Significance evaluation

26.8.8 During the assessment of effects the receptor values in **Table 26-21** are combined with the magnitude of change from **Table 26-23** to produce an overall significance rating based on the evaluation matrix shown in **Table 26-24.** As a general rule, major and moderate effects are considered to be significant and minor and negligible effects are considered to be not significant. However, professional judgement is applied, where appropriate, to determine significant of effect. Where effects are assessed, accordingly to the matrix in **Table 26-24** to be Potentially Significant in EIA terms, professional judgment is applied to determine whether they are Significant or Not Significant.

Table 26-24 Significance evaluation matrix

		Magnitude of change			
		High	**Medium**	**Low**	**Negligible**
Value	**High**	Major (Significant)	Major (Significant)	Moderate (Potentially significant)	Minor (Not significant)
	Medium	Major (Significant)	Moderate (Potentially significant)	Minor (Not significant)	Negligible (Not significant)
	Low	Moderate (Potentially Significant)	Moderate (Potentially significant)	Negligible (Not significant)	Negligible (Not significant)
	Very Low	Moderate (Potentially significant)	Negligible (Not significant)	Negligible (Not significant)	Negligible (Not significant)

26.8.9 **Sections 26.9** to **26.11** set out the assessment of potential effects upon water environment receptors that could result during the Construction, operation and maintenance, and Decommissioning phases of the Proposed Development respectively.

26.8.10 To avoid repetition, the assessment of potential effects has been undertaken for the three main infrastructure types, comprising the proposed landfall, the onshore cable corridor, and the onshore substation. Given the wide variety of potential receptors identified in **Table 26-22**, where receptor values vary, the highest value has been specified for each identified potential effect. Effects from the individual infrastructure types will in general be the same across different sections of the extensive onshore cable corridor, and so no section-specific infrastructure assessment is required.

26.8.11 Effects on the water environment will principally be associated with the Construction phase as this will involve the greatest change from baseline conditions. Once constructed, the Proposed Development is expected to result in relatively limited effects. After the lifetime of Proposed Development (assumed to be around 30 years), it is possible that the onshore substation may be retained and not decommissioned. However, in accordance with the Scoping Report and Scoping Opinion (RED, 2020; Planning Inspectorate, 2020), the most likely decommissioning scenario for the Proposed Development is also considered here. Decommissioning effects will be similar to Construction phase effects, albeit in reverse and of a lower magnitude as sub-surface cable infrastructure will be left in-situ.

26.9 Assessment of effects: Construction phase

Overview

26.9.1 The Construction phase includes all activities that are required to construct the sub-surface onshore cable circuits and installation of a new onshore substation. This will comprise the excavation of trenches for the installation of two underground cable circuits between the proposed landfall at Climping through to a new onshore substation and then onto the existing National Grid substation at Bolney. As noted in the maximum design scenario part of **Section 26.7** (see **paragraphs 26.7.4** to **26.7.6**), a reasonable worst case assessment has been carried out within the maximum assessment assumptions described in **Table 26-19** to ensure that the onshore cable corridor and onshore substation have each been fully taken into account within the following assessment sections.

Landfall

26.9.2 Relevant landfall construction works will comprise a single site using HDD installation techniques, use of a landfall temporary construction compound, excavation and reinstatement of TJBs for the jointing of transitional offshore and onshore cables and construction access via a temporary construction haul route.

26.9.3 These works lie within the sub-catchment of the Ryebank Rife tributary of the Transitional Arun, and adjacent to the Coastal Sussex water body as identified within **Section 26.6**. Within these catchments there are several licensed abstractions (A1, A5 and A6) and a PWS (P1) from **Table 26-10** and **Table 26-22** that have been screened in for assessment.

26.9.4 The limits of deviation of the landfall HDD (as well as the subsequent onshore cable corridor up to the crossing of the River Arun) is partially sited in a tidal floodplain in Flood Zone 3 behind an existing Environment Agency sea defence. As noted in **Chapter 3: Alternatives, Volume 2** of the ES (Document Reference: 6.2.3), this location was selected for landfall as a result of other surrounding constraints, including surrounding residential and protected areas, which have prevented the selection of a corridor outside of a flood risk zone. As reported in **Section 26.6,** the Environment Agency has also advised that its long-term strategy could be to allow natural processes to reform the man-made section of the sea defence into a natural embankment. This could potentially result in a shift of the

coastline landwards as part of natural realignment. The landfall temporary construction compound containing the TJBs has been carefully sited inland from this on higher ground to mitigate any potential effect. In addition to this, it is understood that the TJBs and other joint bays will not have a solid surface, will be backfilled and finished level with the ground surface (with no raised structure), and will be designed to be resilient to submergence and flooding once built.

26.9.5 **Table 26-25** lists all of the potential effects associated with the construction of the landfall. As presented within the Scoping Report (RED, 2020), landfall works are not anticipated to result in potential effects on groundwater levels during construction. This has been scoped out on the basis that works will be limited to the coastal area and the local water table will be connected to the sea levels, and therefore unlikely to be altered much by the site works. None of the potential effects identified for the landfall relate to conservation sites, ponds and springs, given that there are none of these features in the vicinity of the proposed works.

26.9.6 An indication is provided for the range of the value, magnitude and significance definitions for each potential effect based on **Table 26-21**, **Table 26-23** and **Table 26-24** and the receptor value assessments in **Table 26-22**. The magnitude of change, and hence the significance, of potential effects have been assessed on the assumption that the embedded environmental measures listed in **Table 26-20** including **Outline CoCP** (Document Reference: 7.2) measures are implemented as part of the Proposed Development (the assessment is of residual (post-embedded environmental measures) effects).

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Table 26-25 Potential residual effects during the construction of the landfall

Receptors	Activity and potential effect	Embedded environmental measures-	Value	Magnitude of effect	Significance of effect
Groundwater and Surface WFD Water Bodies (River, Transitional and Coastal) **Littlehampton Anticline West GB40701G504900** **Ryebank Rife GB10704100662** **Arun Lower GB540704105000** **Sussex GB640704540003**	Potential for accidental contamination entering watercourses or groundwater, associated with spillage or leakage of fuels, lubricants or other chemicals. This includes the potential for leakage of bentonite during HDD.	C-8, C-76, C-135, C-142, C-148, C-149, C-150, C-151, C-167, C-182, C-227, C-234, C-235, C-236, C-241, C-245, C-247	Medium – High	Negligible	**Negligible – Minor adverse** (**Not Significant**)
Surface WFD Water Bodies (River, Transitional and Coastal) **Ryebank Rife GB10704100662** **Arun Lower GB540704105000**	Ground disturbance and mobilisation of sediments / contaminants leading to silt laden or otherwise contaminated runoff entering watercourses and / or intertidal areas.	C-7, C-8, C-10, C-11, C-13, C-19, C-25, C-27, C-28, C-30, C-33, C-73, C-75, C-76, C-77, C-120, C-121 C-122, C-125, C-126, C-127, C-128, C-129, C-130, C-131, C-133, C-135, C-137, C-138, C-139, C-140,	Medium	Negligible – Low	**Negligible – Minor adverse** (**Not Significant**)

Receptors	Activity and potential effect	Embedded environmental measures-	Value	Magnitude of effect	Significance of effect
Sussex GB640704540003		C-141, C-142, C-143, C-144, C-145, C-148, C-182			
	Changes to watercourse morphology as a result of works in or near watercourses (for example, installation of landfall cable and associated earthworks).	C-7, C-8, C-10, C-11, C-13, C-19, C-25, C-27, C-28, C-30, C-33, C-73, C-75, C-76, C-77, C-120, C-122, C-125, C-126, C-127, C-128, C-129, C-130, C-131, C-133, C-135, C-137, C-138, C-139, C-140, C-141, C-142, C-143, C-144, C-145, C-148, C-182, C-229	Medium	Negligible	**Negligible** (**Not Significant**)
Water Resources **Licensed abstractions (A1, A5 and A6)**	Reduction of water availability to support existing surface water and groundwater abstractions as a consequence of water quantity and / or quality effects. This could arise from dewatering of the excavations for cabling, ground disturbance for the development of temporary access	C-7, C-8, C-10, C-11, C-13, C-19, C-25, C-27, C-28, C-30, C-33, C-73, C-74, C-75, C-76, C-77, C-78, C-120, C-121, C-122, C-125, C-126, C-127, C-128, C-129,	Medium	Negligible – Low	**Negligible – Minor adverse** (**Not Significant**)

Receptors	Activity and potential effect	Embedded environmental measures-	Value	Magnitude of effect	Significance of effect
PWSs (P1)	track / temporary construction compound establishment, or the leakage / spillage of fuels and chemicals onsite. This includes the potential for breakout and leakage of bentonite during HDD.	C-130, C-131, C-133, C-134, C-135, C-137, C-138, C-140, C-141, C-142, C-143, C-144, C-145, C-146, C-147, C-149, C-150, C-151, C-167, C-179, C-181, C-182,, C-227, C-234, C-235, C-236, C-241, C-245, C-253	Medium	Negligible	**Negligible** (**Not Significant**)
Flood Risk Receptors **Residential properties (Atherington, The Mill, Climping and Climping Park)**	Volumetric displacement of flood water associated with the construction of temporary stockpiles and raised access tracks within floodplain areas.	C-11, C-19, C-20, C-21, C-75, C-119, C-120, C-121, C-122, C-123, C-124, C-127, C-128, C-130, C-131, C-132, C-133, C-134, C-175, C-179, C-180, C-181, C-230, C-247	Low – Medium	Negligible	**Negligible** (**Not Significant**)
	Changes in runoff rates and new flow pathways associated with ground disturbance and the development of temporary access tracks and temporary construction compound areas.	C-11, C-13, C-17, C-18, C-19, C-20, C-21, C-27, C-28, C-33, C-73, C-74, C-75, C-77, C-117, C-119, C-120, C-121, C-122, C-123, C-124, C-125, C-126, C-127,	Low – Medium	Negligible	**Negligible** (**Not Significant**)

Receptors	Activity and potential effect	Embedded environmental measures-	Value	Magnitude of effect	Significance of effect
		C-128, C-129, C-130, C-131, C-132, C-133, C-134, C-138, C-139, C-140, C-144, C-148, C-175, C-176, C-177, C-178 C-179, C-180, C-181, C-182			
	Increases in flow in watercourses due to dewatering of excavations.	C-29, C-77, C-118, C-134, C-141	Low – Medium	Negligible	**Negligible** (**Not Significant**)

Onshore cable corridor

26.9.7 During construction, four separate parallel trenches and a number of joint bays will be excavated and backfilled to install the cable circuit. Access tracks will also be constructed to facilitate the movement of construction vehicles and plant.

26.9.8 The onshore cable corridor is approximately 38.8km in length. The temporary working width for cable circuit installation (the onshore cable corridor) will be 40m (widened in locations where there is a technical necessity, such as at trenchless crossing sites), while the target excavation depth of the cable will be on average 1.2m. Access tracks will generally be installed with aggregate along the designated route, following initial topsoil stripping activities. Installation of the cable circuits, and possible haul route / access tracks, will require watercourse crossings. The works will require a number of temporary construction compounds, which will also require topsoil stripping to provide a suitable area. Temporary construction compound areas will include storage of material / waste and equipment, and welfare facilities.

26.9.9 The onshore cable corridor lies within all of the sub-catchments of the River Arun and River Adur identified in **Section 26.6**. Therefore, each of the water environment receptors that were screened in in **Table 26-22** have a potential connection to the onshore cable corridor. For the purposes of clear presentation in **Table 26-26,** the receptors have been grouped into their generic types.

26.9.10 The onshore cable corridor has been carefully routed to try and avoid the numerous water supplies along with other aspect constraints (such as conservation and heritage sites) distributed throughout the wider area of the South Downs, and in addition a number of key embedded environmental measures (see **Table 26-20**) have been put in place to ensure that such receptors are adequately protected. A Hydrogeological Risk Assessment has also been carried out as presented in **Appendix 26.4: Hydrogeological Risk Assessment**, **Volume 4** of the ES (Document Reference: 6.4.26.4) with a key focus on the Southern Water Angmering and Patching public water supply receptors. The other area of potential concern relates to the watercourse crossings and interactions with fluvial and tidal flood zones that have been identified along the onshore cable corridor and given careful consideration at the outline design process, as documented within the draft crossing schedule in **Appendix 4.1: Crossings schedule, Volume 4** of the ES (Document Reference: 6.4.4.1).

26.9.11 **Table 26-26** lists the potential adverse effects associated with the cable laydown in relation to the water environment. An indication is provided for the range of the value, magnitude and significance definitions for each potential effect based on **Table 26-21**, **Table 26-23** and **Table 26-24** and the receptor value assessments in **Table 26-22**. The magnitude of change, and hence the significance, of potential effects have been assessed on the assumption that the embedded environmental measures listed in **Table 26-20** including **Outline CoCP** (Document Reference: 7.2) measures are implemented as part of the Proposed Development (the assessment is of residual (post-embedded mitigation) effects).

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Table 26-26 Potential residual effects during the cable laydown

Receptor groups	Activity and potential effect	Embedded environmental measures	Value	Magnitude of effect	Significance of effect
Groundwater WFD Water Bodies	A decline in groundwater levels arising from dewatering of the trenched excavations for cabling or the development of less permeable access track / temporary construction compound establishment reducing infiltration.	C-7, C-19, C-20, C-27, C-29, C-73, C-74, C-77, C-120, C-121, C-129, C-133, C-140, C-141, C-144, C-147	Medium – High	Negligible	**Negligible – Minor adverse** (**Not Significant**)
Groundwater and Surface Water WFD Water Bodies (River, Transitional and Coastal)	Potential for accidental contamination entering groundwater or watercourses, associated with spillage or leakage of fuels, lubricants or other chemicals. This includes the potential for leakage of bentonite during trenchless crossing.	C-8, C-76, C-135, C-142, C-148, C-149, C-150, C-151, C-167, C-182, C-227, C-234, C-235, C-236, C-241, C-245, C-246, C-251	Medium – High	Negligible	**Negligible – Minor adverse** (**Not Significant**)
Surface Water WFD Water Bodies (River, Transitional and Coastal)	Ground disturbance and mobilisation of sediments / contaminants leading to silt laden or otherwise contaminated runoff entering watercourses.	C-7, C-8, C-10, C-11, C-13, C-19, C-25, C-27, C-28, C-30, C-33, C-73, C-75, C-76, C-77, C-120, C-122, C-125, C-126, C-127, C-128, C-129, C-130, C-131, C-133, C-135, C-137, C-138, C-139, C-140,	Medium	Negligible – Low	**Negligible – Minor adverse** (**Not Significant**)

Receptor groups	Activity and potential effect	Embedded environmental measures	Value	Magnitude of effect	Significance of effect
		C-141, C-142, C-143, C-144, C-145, C-148, C-182, C-292			
	Changes to watercourse morphology as a result of works in or near watercourses (for example, installation of watercourse crossings and associated earthworks).	C-7, C-8, C-10, C-11, C-13, C-19, C-25, C-27, C-28, C-30, C-33, C-73, C-75, C-76, C-77, C-120, C-122, C-125, C-126, C-127, C-128, C-129, C-130, C-131, C-133, C-135, C-137, C-138, C-139, C-140, C-141, C-142, C-143, C-144, C-145, C-148, C-182, C-229, C-292	Medium	Negligible	**Negligible (Not Significant)**
Conservation Sites, Chalk Streams, Ponds and Springs	Reduction of water availability to support existing groundwater or surface water designated or undesignated sites, ecosystems and features. This could arise from dewatering of the trenched excavations for cabling, ground disturbance for the development of temporary access track establishment, or the leakage / spillage of fuels and	C-6, C-7, C-8, C-10, C-11, C-13, C-17, C-18, C-19, C-20, C-21, C-25, C-27, C-28, C-29, C-30, C-33, C-64, C-73, C-74, C-76, C-77, C-120, C-121, C-122, C-124, C-125, C-126, C-127, C-128,	Very Low – Medium	Negligible – Low	**Negligible – Minor adverse (Not Significant)**

Receptor groups	Activity and potential effect	Embedded environmental measures	Value	Magnitude of effect	Significance of effect
	chemicals onsite. This includes the potential for breakout and leakage of bentonite during trenchless crossing.	C-129, C-130, C-131, C-133, C-134, C-135, C-137, C-138, C-139, C-140, C-141 C-142, C-143, C-144, C-145, C-146, C-147, C-148, C-149, C-150, C-151, C-167, C-176, C-179, C-181, C-182, C-184, C-229, C-234, C-235, C-236, C-241, C-245, C-246, C-250, C-251, C-252, C-292			
Water Resources **Licensed abstractions – Southern Water public water supplies**	Reduction of water availability to support existing surface water and groundwater abstractions as a consequence of water quantity and / or quality effects. This could arise from dewatering of the trenched excavations for cabling, ground disturbance for the development of temporary access track / temporary construction compound establishment, or the leakage / spillage of fuels and chemicals onsite. This includes the	C-7, C-8, C-10, C-11, C-13, C-18, C-19, C-20, C-21, C-25, C-27, C-28, C-29, C-30, C-33, C-73, C-74, C-75, C-76, C-77, C-78, C-120, C-121, C-122, C-125, C-126, C-127, C-128, C-129, C-130, C-131, C-133, C-134, C-135, C-137, C-138, C-140, C-141, C-142,	High	Negligible	**Minor adverse** (**Not Significant**)
Other (non-public) licensed abstractions			Low – Medium	Negligible – Low	**Negligible – Minor**

Receptor groups	Activity and potential effect	Embedded environmental measures	Value	Magnitude of effect	Significance of effect
	potential for breakout and leakage of bentonite during trenchless crossing.	C-143, C-144, C-145, C-146, C-147, C-149, C-150, C-151, C-167, C-179, C-181, C-182, C-227, C-234, C-235, C-236, C-241, C-245, C-246, C-250, C-251, C-252, C-253			**adverse (Not Significant)**
PWSs and unregistered mapped wells			Low – Medium	Negligible – Low	**Negligible – Minor adverse (Not Significant)**
Consented discharges	Physical disruption to existing discharge infrastructure (for example, septic tank soakaways or discharge outfalls) from trenching and temporary access track / temporary construction compound establishment.	C-28, C-33, C-146, C-151	Low	Negligible	**Negligible (Not Significant)**
Flood Risk Receptors	Changes in watercourse conveyance associated with temporary watercourse crossings.	C-5, C-17, C-18, C-20, C-118, C-126, C-127, C-128, C-130, C-131, C-132, C-133, C-134, C-139, C-145, C-148, C-176, C-177, C-178, C-182, C-184	Low – High	Negligible	**Negligible – Minor adverse (Not Significant)**
	Volumetric displacement of flood water associated with the construction of temporary stockpiles and raised access tracks within floodplain areas.	C-11, C-19, C-20, C-21, C-75, C-119, C-120, C-121, C-122, C-123, C-124, C-127,	Low – High	Negligible	**Negligible – Minor adverse (Not Significant)**

Receptor groups	Activity and potential effect	Embedded environmental measures	Value	Magnitude of effect	Significance of effect
		C-128, C-130, C-131, C-132, C-133, C-134, C-175, C-179, C-180, C-181, C-184			
	Changes in runoff rates and new flow pathways associated with ground disturbance and the development of temporary access tracks and temporary construction compound areas.	C-11, C-13, C-17, C-18, C-19, C-20, C-21, C-27, C-28, C-33, C-73, C-74, C-75, C-77, C-117, C-119, C-120, C-121, C-122, C-123, C-124, C-125, C-126, C-127, C-128, C-129, C-130, C-131, C-132, C-133, C-134, C-138, C-139, C-140, C-144, C-148, C-175, C-176, C-177, C-178 C-179, C-180, C-181, C-182, C-184	Low – High	Negligible	**Negligible – Minor adverse** (**Not Significant**)
	Increases in flow in watercourses due to dewatering of excavations.	C-29, C-77, C-118, C-134, C-141, C-184	Low – High	Negligible	**Negligible – Minor adverse** (**Not Significant**)

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Onshore substation

26.9.12 Construction of the onshore substation will include the establishment of a temporary construction compound with associated storage and offices / welfare facilities, topsoil storage, installation of drainage systems and the development of below ground earth grid and onshore substation support structures. For the purposes of assessment, the entire onshore substation footprint is assumed to be approximately 60,000m^2, whilst the temporary works area including the temporary construction compound area is 25,000m^2. The foundations will necessitate excavations and may require piling depending on ground conditions. There is also a proposed extension of the existing National Grid Bolney substation assumed to be 3,500m^2 in footprint, with a temporary works area of 7,200m^2.

26.9.13 The onshore substation site at Oakendene is located within the catchment of Cowfold Stream, whilst the extension to the existing National Grid Bolney substation is within the Adur (East) catchment, as shown in **Figure 26.2, Volume 3** of the ES (Document Reference: 6.3.26).

26.9.14 All surface water WFD receptors as listed in **Table 26-22**. The nearest groundwater WFD water body is the Adur and Ouse Hastings Beds situated approximately 500m from the onshore substation site. None of the potentially water dependent conservation sites, ponds or springs have a potential connection to the onshore substation site. Registered water resources receptors do not have a potential connection to the onshore substation site, and there are three discharges (D2, D3, D4) which are situated on the borders of the Existing National Grid Bolney substation extension. There are also seven unregistered wells which have been identified on OS mapping within the catchments of Adur East (Sakeham) and the Cowfold Stream which have been considered as potential receptors as part of a precautionary approach. A potential flood risk receptor identified at Springlands, Wineham was also identified within **Appendix 26.2: Flood Risk Assessment, Volume 4** of the ES (Document Reference: 6.4.26.2).

26.9.15 **Table 26-27** lists the potential effects associated with the construction of the proposed onshore substation site in relation to the water environment. An indication is provided for the range of the value, magnitude and significance definitions for each potential effect based on **Table 26-21**, **Table 26-23** and **Table 26-24** and the receptor value assessments in **Table 26-22**. The magnitude of change, and hence the significance, of potential effects have been assessed on the assumption that the embedded environmental measures listed in **Table 26-20** including **Outline CoCP** (Document Reference: 7.2) measures are successfully implemented as part of the Proposed Development (the assessment is of residual (post-embedded mitigation) effects).

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Table 26-27 Potential residual effects during construction of the onshore substation

Receptor	Activity and potential effect	Embedded environmental measures	Value	Magnitude of effect	Significance of effect
Groundwater WFD Water Body **Adur and Ouse Hastings Beds GB40702G502000**	A decline in groundwater levels arising from of the trenched excavations for the onshore substation or piling if it is required for the installation of sub-surface foundations.	C-27, C-33, C-73, C-74, C-76, C-77, C-120, C-121, C-129, C-140, C-141, C-144, C-152	High	Negligible	**Minor adverse (Not Significant)**
Groundwater and Surface Water WFD Water Bodies (River and Transitional) **Adur and Ouse Hastings Beds GB40702G502000** **Adur East (Sakeham) GB107041012900** **Cowfold Stream GB107041012260** **Adur GB540704116000**	Potential for accidental contamination entering groundwater or watercourses, associated with spillage or leakage of fuels, lubricants or other chemicals.	C-8, C-33, C-76, C-149, C-150, C-151, C-167, C-182, C-227, C-234, C-235, C-236, C-241	Medium – High	Negligible	**Negligible – Minor adverse (Not Significant)**

Receptor	Activity and potential effect	Embedded environmental measures	Value	Magnitude of effect	Significance of effect
Surface Water WFD Water Bodies (River and Transitional) **Adur East (Sakeham) GB107041012900** **Cowfold Stream GB107041012260** **Adur GB540704116000**	Ground disturbance and mobilisation of sediments / contaminants leading to silt laden or otherwise contaminated runoff entering watercourses.	C-7, C-8, C-11, C-13, C-21, C-25, C-27, C-30, C-33, C-73, C-76, C-77, C-120, C-121, C-130, C-133, C-135, C-140, C-142, C-143, C-148, C-151, C-152, C-167, C-182	Medium	Negligible – Low	**Negligible – Minor adverse** (**Not Significant**)
	Changes to watercourse morphology as a result of works in or near watercourses (for example, associated with earthworks for establishment of temporary construction compounds).	C-7, C-8, C-11, C-13, C-21, C-25, C-27, C-30, C-33, C-73, C-76, C-77,C-120, C-130, C-133, C-135, C-140, C-148, C-151, C-152, C-182.	Medium	Negligible	**Negligible** (**Not Significant**)
Water Resources **Unregistered mapped wells (Frylands Lane (2), The Hangers, Ewhurst Cottages, The Rectory,**	Reduction of water availability to support existing surface water and groundwater abstractions as a consequence of water quantity and / or quality effects. This could arise from dewatering of the excavations or piling for installation of onshore substation foundations, ground disturbance for the development of temporary	C-7, C-8, C-11, C-13, C-21, C-25, C-27, C-28, C-30, C-33, C-73, C-74, C-76, C-77, C-78, C-120, C-121, C-130, C-133, C-135, C-140, C-141, C-142, C-143, C-144, C-145, C-146, C-147,	Low	Negligible	**Negligible** (**Not Significant**)

Receptor	Activity and potential effect	Embedded environmental measures	Value	Magnitude of effect	Significance of effect
Park Farm, and The Fodges on Kent Street)	construction compound establishment, or the leakage / spillage of fuels and chemicals onsite.	C-148, C-150, C-151, C-152, C-154, C-167, C-182, , C-227, C-234, C-235, C-236, C-241			
Consented discharges (D2, D3, D4)	Physical disruption to existing discharge infrastructure (for example, septic tank soakaways or discharge outfalls) from trenching and temporary access track / temporary construction compound establishment.	C-28, C-33, C-146, C-151	Low	Negligible	**Negligible (Not Significant)**
Flood Risk Receptors	Volumetric displacement of flood water associated with the construction of temporary stockpiles within floodplain areas.	C-11, C-21, C-27, C-75, C-130, C-131, C-132, C-133, C-179, C-230, C-184	Medium	Negligible	**Negligible (Not Significant)**
	Changes in runoff rates and new flow pathways associated with ground disturbance and the development of temporary construction compound areas and onshore substation search areas.	C-11, C-21, C-27, C-73, C-74, C-75, C-77, C-118. C-120, C-121, C-129, C-130, C-134, C-140, C-141, C-144, C-152, C-175, C-179, C-182, C-184	Medium	Negligible	**Negligible (Not Significant)**
	Increases in flow in watercourses due to dewatering of excavations.	C-29, C-77, C-118, C-134, C-141, C-184	Medium	Negligible	**Negligible (Not Significant)**

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26.10 Assessment of effects: Operation and maintenance phase

Onshore cable circuits

26.10.1 The operation and maintenance phase will include the maintenance and refurbishment (if / as required) during the lifespan of the Proposed Development. The landfall TJBs, cable circuits and link boxes will be installed with protection and it is considered that their operation will largely be maintenance-free (non-intrusive routine testing will be undertaken). Should damage or a fault occur, testing will identify its specific location so that any excavations or infrastructure replacement can be isolated. Given the minimal extent and similarity of activities for the landfall and cable circuits, they are both considered together within this sub-section. As such, each of the potential receptors that were considered for the landfall and onshore cable corridor infrastructure types during the Construction phase are also considered in this section.

26.10.2 It has been assumed that the temporary construction access tracks and associated watercourse crossings utilised during construction will not be required during the operation and maintenance phase. Should repairs be necessary, there could be potential for localised ground disturbance or potential for accidental contamination from machinery. Otherwise, potential effects during the operation and maintenance phase are expected to be considerably reduced and limited in scale in comparison to the Construction phase due to this targeted approach.

26.10.3 As outlined in the Scoping Report (RED, 2020), it is unlikely that there will any dewatering during the operation and maintenance phase given that the work onsite is to be targeted on isolated repairs. The only potential effect on the sub-surface and groundwater flow pathway regime will be associated with the presence of protective covers / ducts and a selected backfill (either originally excavated material or CBS) surrounding material for thermal insulation around the buried cable circuits. The ducts will be covered by metallic exterior and connected to concrete lined joint bays, which will be limited in extent. It has been assumed that the associated cable watercourse crossings are also likely to be similarly lined with a layer of impermeable material for protection against erosion.

26.10.4 The proposed landfall lies within the sub-catchment of the Ryebank Rife tributary of the Transitional Arun, and adjacent to the Coastal Sussex water body, whilst the onshore cable corridor lies within all of the sub-catchments of the River Arun and River Adur identified in **Section 26.6**. Therefore, each of the water environment receptors that were screened in in **Table 26-22** are potentially affected by the operation and maintenance works. For the purposes of clear presentation in **Table 26-28**, the receptors have been grouped into their generic types.

26.10.5 **Table 26-28** lists the potential effects associated with the operation and maintenance of the proposed landfall and the cable circuits in relation to the water environment. An indication is provided for the range of the value, magnitude and significance definitions for each potential effect based on **Table 26-21**, **Table 26-23** and **Table 26-24** and the receptor value assessments in **Table 26-22**. The magnitude of change, and hence the significance, of potential effects have been

assessed on the assumption that the embedded environmental measures listed in **Table 26-20** including **Outline CoCP** (Document Reference: 7.2) measures are implemented as part of the Proposed Development (the assessment is of residual (post-embedded measures) effects).

Table 26-28 Potential residual effects during the operation and maintenance of the landfall and cable circuits

Receptor groups	Activity and potential effect	Embedded environmental measures	Value	Magnitude of effect	Significance of effect
Groundwater and Surface Water WFD Water Bodies (River, Transitional and Coastal)	Potential for accidental contamination entering groundwater or watercourses. This could arise from isolated cable repairs or the leakage / spillage of fuels and chemicals from vehicles onsite.	C-8, C-149, C-150, C-151, C-153, C-182	Medium – High	Negligible	**Negligible – Minor adverse** (**Not Significant**)
Surface Water WFD Water Bodies (River and Transitional)	Changes to watercourse morphology due to the permanent presence of erosion protection around cable crossings. Cable crossings may exacerbate downstream or upstream bank and bed erosion and sediment deposition.	C-7, C-9, C-25, C-122, C-151, C-153	Medium	Negligible	**Negligible** (**Not Significant**)
Conservation Sites, Chalk Streams, Ponds and Springs	Reduction of water availability to support existing groundwater or surface water designated or undesignated sites, ecosystems and features as a consequence of quantity / quality effects from isolated repairs, and the leakage / spillage of fuels and chemicals from vehicles onsite or from diversion of sub-surface land drainage flow pathways due to the permanent presence of limited below ground	C-6, C-8, C-9, C-21, C-25, C-29, C-33, C-74, C-147, C-149, C-150, C-151, C-153, C-167, C-182	Very Low – Medium	Negligible	**Negligible** (**Not Significant**)

Receptor groups	Activity and potential effect	Embedded environmental measures	Value	Magnitude of effect	Significance of effect
	concrete-lined joint bays and backfilled material around cable circuits.				
Water Resources **Licensed abstractions – Southern Water public water supplies**	Reduction of water availability to support existing surface water and groundwater abstractions as a consequence of water quality and/or quantity effects. This could arise from isolated repairs, and the leakage / spillage of fuels and chemicals from vehicles onsite; or from diversion of sub-surface land drainage flow pathways due to the permanent presence of limited below ground concrete lined joint bays and backfilled material around cable circuits.	C-8, C-21, C-29, C-33, C-74, C-137, C-147, C-149, C-150, C-151, C-153, C-167, C-182	High	Negligible	**Minor adverse** (**Not Significant**)
Other (non-public) licensed abstractions			Low – Medium	Negligible	**Negligible** (**Not Significant**)
PWSs and unregistered mapped wells			Low – Medium	Negligible	**Negligible** (**Not Significant**)
Flood Risk Receptors	Volumetric displacement of flood water associated with maintenance works in floodplains during isolated repairs of the landfall TJB or cable circuits.	C-11, C-19, C-20, C-21, C-75, C-119, C-120, C-121, C-122, C-130, C-132, C-133, C-153, C-154, C-175, C-184	Low – High	Negligible	**Negligible - Minor adverse** (**Not Significant**)

Receptor groups	Activity and potential effect	Embedded environmental measures	Value	Magnitude of effect	Significance of effect
	Changes in runoff rates and new flow pathways associated with ground disturbance during isolated repairs of landfall TJB or cable circuits.	C-11, C-13, C-19, C-20, C-21, C-27, C-28, C-30, C-73, C-74, C-75, C-119, C-120, C-121, C-130, C-131, C-133, C-153, C-175, C-182, C-184	Low – High	Negligible	**Negligible - Minor adverse** (**Not Significant**)

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Onshore substation

26.10.6 The onshore substation will not be permanently staffed, and it will typically be monitored remotely using CCTV. Inspection and minor servicing may be required for the electrical plant, but it is anticipated that the onshore substation will require minimal scheduled operation and maintenance activities. It has also been assumed that access to any of the onshore substation will primarily be along existing transport routes. Therefore, the type and small magnitude of effects are likely to be similar to those described above for the operation and maintenance of the landfall and cable circuits.

26.10.7 The drainage from the impermeable onshore substation footprint and the presence of a below ground grid have the potential to disrupt infiltration and displace shallow groundwater. **Table 26-29** lists the potential effects associated with the operation and maintenance of the onshore substation in relation to the water environment. An indication is provided for the range of the value, magnitude and significance definitions for each potential effect based on **Table 26-21**, **Table 26-23** and **Table 26-24** and the receptor value assessments in **Table 26-22**. The magnitude of change, and hence the significance, of potential effects have been assessed on the assumption that the embedded environmental measures listed in **Table 26-20** including **Outline CoCP** (Document Reference: 7.2) measures are implemented as part of the Proposed Development (the assessment is of residual (post-embedded mitigation) effects).

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Table 26-29 Potential residual effects during the operation and maintenance of the onshore substation

Receptor	Activity and potential effect	Embedded environmental measures	Value	Magnitude of effect	Significance of effect
Groundwater WFD Water Body **Adur and Ouse Hastings Beds GB40702G502000**	A reduction in groundwater levels arising from the presence of a below ground grid, onshore substation support structures and impermeable surfaces.	C-73, C-74, C-140	High	Negligible	**Minor adverse** (**Not Significant**)
Groundwater and Surface Water WFD Water Bodies (River and Transitional) **Adur and Ouse Hastings Beds GB40702G502000** **Adur East (Sakeham) GB107041012900** **Cowfold Stream GB107041012260** **Adur GB540704116000**	Potential for accidental contamination entering groundwater or watercourses, associated with spillage or leakage of fuels, lubricants or other chemicals during occasional maintenance visits.	C-8, C-149, C-151, C-153, C-167	Medium – High	Negligible	**Negligible – Minor adverse** (**Not Significant**)

Receptor	Activity and potential effect	Embedded environmental measures	Value	Magnitude of effect	Significance of effect
Water Resources **Unregistered, mapped wells (Frylands Lane (2), The Hangers, Ewhurst Cottages, The Rectory, Park Farm, Fodges on Kent Street)**	Reduction of water availability to support existing surface water and groundwater abstractions as a consequence of water quantity and / or quality effects. This could arise from the presence of a below ground grid, onshore substation support structures and impermeable surfaces or spillages from fuels / chemicals during occasional maintenance visits.	C-8, C-73, C-74, C-76, C-140, C-146, C-147, C-151, C-153, C-167	Low	Negligible	**Negligible** (**Not Significant**)
Flood Risk Receptors	Changes in runoff rates and new flow pathways associated with the impermeable onshore substation footprint.	C-73, C-74, C-120, C-121, C-124, C-153, C-184, C-230, C-293	Medium	Negligible	**Negligible** (**Not Significant**)

26.11 Assessment of effects: Decommissioning phase

Landfall and onshore cable circuits

26.11.1 At the decommissioning stage, it is anticipated that the landfall TJB and cable circuits will be left buried in-situ with circuit ends being cut and sealed. On this basis, **Table 26-30** lists the potential effects associated with the decommissioning of the landfall and cable circuits in relation to the water environment. An indication is provided for the range of the value, magnitude and significance definitions for each potential effect based on **Table 26-21, Table 26-23** and **Table 26-24** and the receptor value assessments in **Table 26-22.** The magnitude of change, and hence the significance, of potential effects have been assessed on the assumption that the embedded environmental measures listed including **Outline CoCP** (Document Reference: 7.2) measures are implemented as part of the Proposed Development (the assessment is of residual (post-embedded measures) effects).

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Table 26-30 Potential residual effects during decommissioning of the landfall and cable circuits

Receptor groups	Activity and potential effect	Embedded environmental measures	Value	Magnitude of effect	Significance of effect
Groundwater and Surface Water WFD Water Bodies (River, Transitional and Coastal)	Potential for accidental contamination entering groundwater or watercourses. This could arise from isolated decommissioning works and the leakage / spillage of fuels and chemicals from vehicles onsite.	C-8, C-149, C-150, C-151, C-167, C-182	Medium – High	Negligible	**Negligible – Minor adverse** (**Not Significant**)
Surface Water WFD Water Bodies (River and Transitional)	Changes to watercourse morphology due to the permanent presence of erosion protection around cable crossings. Cable crossings may exacerbate downstream or upstream bank and bed erosion and sediment deposition.	C-7, C-9, C-25, C-122, C-151	Medium	Negligible	**Negligible** (**Not Significant**)
Conservation Sites, Ponds and Springs	Reduction of water availability to support existing groundwater or surface water designated or undesignated sites or ecosystems as a consequence of quantity / quality effects from isolated decommissioning works, and the leakage / spillage of fuels and chemicals from vehicles onsite or from diversion of sub-surface land drainage flow pathways due to	C-6, C-8, C-9, C-21, C-25, C-29, C-33, C-74, C-147, C-149, C-150, C-151, C-167, C-182	Very Low – Medium	Negligible	**Negligible** (**Not Significant**)

Receptor groups	Activity and potential effect	Embedded environmental measures	Value	Magnitude of effect	Significance of effect
	the permanent presence of limited below ground concrete-lined joint bays and backfilled material around cable circuits.				
Water Resources **Licensed abstractions – Southern Water public water supplies**	Reduction of water availability to support existing surface water and groundwater abstractions as a consequence of water quality and / or quantity effects. This could arise from isolated decommissioning works, and the leakage / spillage of fuels and chemicals from vehicles onsite; or from diversion of sub-surface land drainage flow pathways due to the permanent presence of limited below ground concrete-lined joint bays and backfilled material around cable circuits.	C-8, C-21, C-29, C-33, C-74, C-137, C-147, C-149, C-150, C-151, C-167, C-182, C-253	High	Negligible	**Minor adverse** (**Not Significant**)
Other (non-public) licensed abstractions			Low – Medium	Negligible	**Negligible** (**Not Significant**)
PWSs and unregistered mapped wells			Low – Medium	Negligible	**Negligible** (**Not Significant**)
Consented discharges	Physical disruption to existing discharge infrastructure (for example, septic tank soakaways or discharge outfalls) from temporary access track /	C-28, C-33, C-146, C-151	Low	Negligible	**Negligible** (**Not Significant**)

Receptor groups	Activity and potential effect	Embedded environmental measures	Value	Magnitude of effect	Significance of effect
	temporary construction compound establishment.				
Flood Risk Receptors	Volumetric displacement of flood water associated with maintenance works in floodplains during decommissioning of the landfall TJB or cable circuits.	C-11, C-19, C-20, C-21, C-75, C-119, C-120, C-121, C-122, C-130, C-132, C-133, C-154, C-175, C-184	Low – High	Negligible	**Negligible – Minor adverse** (**Not Significant**)
	Changes in runoff rates and new flow pathways associated with ground disturbance during decommissioning of the landfall TJB and the cable circuits.	C-11, C-13, C-19, C-20, C-21, C-27, C-28, C-30, C-73, C-74, C-75, C-119, C-120, C-121, C-130, C-131, C-133, C-175, C-182, C-184	Low – High	Negligible	**Negligible – Minor adverse** (**Not Significant**)

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Onshore substation

26.11.2 The onshore substation may be used as a substation site after decommissioning of the Proposed Development, or it may be upgraded for use by other future offshore wind projects, which would be subject to a separate planning application.

26.11.3 Should the onshore substation need to be decommissioned fully, then the decommissioning works are likely to be the reverse of the construction works and involve similar levels of equipment and enabling works infrastructure. On this basis **Table 26-31** lists the potential effects associated with the decommissioning of the onshore substation in relation to the water environment, and an indication is provided for the range of the value, magnitude and significance definitions for each potential effect based on **Table 26-21, Table 26-23** and **Table 26-24** and the receptor value assessments in **Table 26-22**. The magnitude of change, and hence the significance, of potential effects have been assessed on the assumption that the embedded environmental measures listed in **Outline CoCP** (Document Reference: 7.2) measures are implemented as part of the Proposed Development (the assessment is of residual (post-embedded measures) effects).

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Table 26-31 Potential residual effects during decommissioning of the onshore substation

Receptor	Activity and potential effect	Embedded environmental measures	Value	Magnitude of effect	Significance of effect
Groundwater and Surface Water WFD Water Bodies (River and Transitional) **Adur and Ouse Hastings Beds GB40702G502000** **Adur East (Sakeham) GB107041012900** **Cowfold Stream GB107041012260** **Adur GB540704116000**	Potential for accidental contamination entering groundwater or watercourses, associated with spillage or leakage of fuels, lubricants or other chemicals.	C-8, C-27, C-76, C-129, C-149, C-150, C-151, C-167	Medium – High	Negligible	**Negligible – Minor adverse** (**Not Significant**)
Surface Water WFD Water Bodies **Adur and Ouse Hastings Beds GB40702G502000** **Adur East (Sakeham)**	Ground disturbance and mobilisation of sediments / contaminants leading to silt laden or otherwise contaminated runoff entering watercourses.	C-7, C-8, C-11, C-13, C-21, C-25, C-27, C-30, C-33, C-73, C-76, C-77, C-120, C-121, C-130, C-133, C-135, C-140, C-142, C-143, C-148, C-151, C-152, C-167, C-182	Medium	Negligible – Low	**Negligible – Minor adverse** (**Not Significant**)

Receptor	Activity and potential effect	Embedded environmental measures	Value	Magnitude of effect	Significance of effect
GB107041012900 Adur (East) GB107041012180 Cowfold Stream GB107041012260 Adur GB540704116000	Changes to watercourse morphology as a result of works in or near watercourses (for example, associated with earthworks for establishment of compounds).	C-7, C-8, C-11,C-13, C-21, C-25, C-27, C-30, C-33, C-73, C-76, C-77,C-120, C-130, C-133, C-135, C-140, C-148, C-151, C-152, C-182	Medium	Negligible	**Negligible (Not Significant)**
Water Resources **Unregistered, mapped wells (Frylands Lane (2), The Hangers, Ewhurst Cottages, The Rectory, Park Farm, Fodges on Kent Street)**	Reduction of water availability to support existing surface water and groundwater abstractions as a consequence of water quantity and / or quality effects. This could arise from disturbance for the development of temporary decommissioning access / temporary construction compound establishment, or the leakage / spillage of fuels and chemicals onsite.	C-7, C-8, C-11, C-13, C-21, C-25, C-27, C-28, C-30, C-33, C-73, C-74, C-76, C-77, C-78, C-120, C-121, C-130, C-133, C-135, C-140, C-141, C-142, C-143, C-144, C-146, C-147, C-148, C-150, C-151, C-152, C-167, C-182	Low	Negligible	**Negligible (Not Significant)**
Consented discharges (D3)	Physical disruption to existing discharge infrastructure (for example, septic tank soakaways or discharge outfalls) from temporary access track / temporary construction compound establishment.	C-28, C-33, C-146, C-151	Low	Negligible	**Negligible (Not Significant)**

Receptor	Activity and potential effect	Embedded environmental measures	Value	Magnitude of effect	Significance of effect
Flood Risk Receptors	Volumetric displacement of flood water associated with the placement of temporary stockpiles within floodplain areas.	C-11, C-21, C-27, C-75, C-130, C-131, C-132, C-133, C-179, C-184, C-230	Medium	Negligible	**Negligible (Not Significant)**
	Changes in runoff rates and new flow pathways associated with ground disturbance and the development of temporary access track / temporary construction compound areas.	C-11, C-21, C-27, C-73, C-74, C-75, C-77, C-120, C-118, C-121, C-129, C-130, C-134, C-140, C-141, C-144, C-152, C-175, C-179, C-182, C-184, C-230	Medium	Negligible	**Negligible (Not Significant)**

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26.12 Assessment of cumulative effects

Approach

26.12.1 A CEA examines the combined impacts of Rampion 2 in combination with other developments on the same single receptor or resource and the contribution of Rampion 2 to those impacts. The overall method followed in identifying and assessing potential cumulative effects in relation to the onshore environment is set out in **Chapter 5: Approach to the EIA, Volume 2** of the ES (Document Reference: 6.2.5) and **Appendix 5.3: Cumulative effects assessment detailed onshore search and screening criteria, Volume 4** of the ES (Document Reference: 6.4.5.3).

26.12.2 The onshore screening approach follows the Planning Inspectorate's Advice Note Seventeen (Planning Inspectorate, 2019) which is an accepted process for Nationally Significant Infrastructure Projects (NSIPs) and follows the four-stage approach set out in the guidance.

Cumulative effects assessment

26.12.3 For water environment, a Zone of Influence (ZoI) has been applied for the CEA to ensure direct and indirect cumulative effects can be appropriately identified and assessed. The water environment ZoI is shown in **Figure 26.9, Volume 3** of the ES (Document Reference: 6.3.26).

26.12.4 A short list of 'other developments' that may interact with the Rampion 2 ZoIs during their construction, operation or decommissioning is presented in **Appendix 5.4: Cumulative effects assessment shortlisted developments, Volume 4** of the ES (Document Reference: 6.4.5.4) and on **Figure 5.4.2** to **5.4.4, Volume 4** of the ES (Document Reference: 6.4.5.4). This list has been generated applying criteria set out in **Chapter 5: Approach to the EIA, Volume 2** of the ES (Document Reference: 6.2.5) and **Appendix 5.3: Cumulative effects assessment detailed onshore search and screening criteria, Volume 4** of the ES (Document Reference: 6.4.5.3) and has been collated up to the finalisation of the ES through desk study, consultation, and engagement.

26.12.5 Only those 'other developments' in the short list that fall within the water environment ZoI have the potential to result in cumulative effects with the Proposed Development on water environment. All 'other developments' falling outside the water environment ZoI are excluded from this assessment.

26.12.6 A tiered approach to the CEA has been set out in **Table 5-6** in **Chapter 5: Approach to the EIA, Volume 2** of the ES (Document Reference: 6.2.5) and can be summarised as follows:

- Tier 1: developments under construction, permitted applications, and submitted applications;
- Tier 2: Other developments on the Planning Inspectorate Programme of Projects where a Scoping Report has been submitted; and

- Tier 3: Other developments on the Planning Inspectorate Programme of Projects where a Scoping Report has not been submitted, or where developments are identified in Development Plans or other plans as appropriate.

26.12.7 On the basis of the above, the following specific other developments contained within the short list in **Appendix 5.4: Cumulative effects assessment shortlisted developments, Volume 4** of the ES (Document Reference: 6.4.5.4) are considered in this CEA, as discussed in **Table 26-32**. The cumulative project design envelope for the water environment is described in **Table 26-33**.

Table 26-32 Developments considered as part of the water environment CEA

ID[12]	Development type	Development name	Application reference	Status	Confidence in assessment	Tier[13]	Distance to Rampion 2 (m)
1	Highways A new dual carriageway bypass	A27 Arundel Bypass	TR010045	Pre-application: Scoping Opinion published 14/04/2010	Medium	2	The site lies approximately 900m to the north-west of the proposed DCO Order Limits and the preferred alignment of the bypass crosses the River Arun approximately 2.7km upstream of a proposed trenchless crossing. A simple qualitative level of assessment is carried out (in **Table 26-34**) on the basis that a successful implementation of embedded and

[12] ID reference as stated in Table 2-1 in **Appendix 5.4: Cumulative effects assessment shortlisted developments, Volume 4** of the ES (Document Reference: 6.4.5.4) and on **Figure 5.4.2** to **5.4.4, Volume 4** of the ES (Document Reference: 6.4.5.4).
[13] **Chapter 5: Approach to the EIA, Volume 2** of the ES (Document Reference: 6.2.5) sets out the full definitions of the tiers.

ID[12]	Development type	Development name	Application reference	Status	Confidence in assessment	Tier[13]	Distance to Rampion 2 (m)
							standard good industry practice measures will offset any potential significant effects.
13 / 14 / 63	Mixed Use 300 dwellings and ancillary infrastructure	Land at Climping Arun Local Plan (2018) Reference Site SD10 Policy H SP2c	CM/48/21/RES / CM/1/17/OUT / Local Plan site (SD10)	Application pending a decision: submitted 31/08/2021 / Application approved (after appeal) 28/09/2018 / Allocated in Local Plan	High	1	The south-eastern corner of the property development overlaps with the footprint of the temporary construction compound for the proposed landfall works. The development is situated on the proposed DCO Order Limits edge of a proposed access point for the River Arun trenchless crossing. It is situated within the same catchment (that of Ryebank Rife). A

ID[12]	Development type	Development name	Application reference	Status	Confidence in assessment	Tier[13]	Distance to Rampion 2 (m)
							simple qualitative level of assessment is carried out (in **Table 26-34**) on the basis that a successful implementation of embedded and standard good industry practice measures will offset any potential significant effects.
16	Mixed Use Demolition of existing treatment works and redevelopment to provide up to 105 homes	Land west of Bridge Road Roundabout	LU/238/20/OUT	Application approved 22/04/2022	High	1	The residential development is situated approximately 150m from the onshore cable corridor and on the edge of the River Arun downstream of a trenchless crossing. A simple qualitative level of assessment is carried out (in **Table 26-34**) on the basis

ID[12]	Development type	Development name	Application reference	Status	Confidence in assessment	Tier[13]	Distance to Rampion 2 (m)
							that a successful implementation of embedded and standard good industry practice measures will offset any potential significant effects.
17	Industrial (waste) Change of use of existing hangar building from industrial / storage to a combined heat and power plant	Rudford Industrial Estate	WSCC/015/22	Application pending a decision: submitted 10/06/2022	High	1	The energy development is situated approximately 375m to the north-west of the proposed DCO Order Limits at the edge of a proposed access point for the River Arun trenchless crossing. It is not situated within the same catchment (that of Ryebank Rife) as the proposed DCO Order Limits. A simple qualitative

ID[12]	Development type	Development name	Application reference	Status	Confidence in assessment	Tier[13]	Distance to Rampion 2 (m)
							level of assessment is carried out (in **Table 26-34**) on the basis that a successful implementation of embedded and standard good industry practice measures will offset any potential significant effects.
20	Industrial (materials) Construction (concrete batching plant)	Unit H6 Rudford Industrial Estate	CM/56/19/PL	Application approved 29/05/2020	High	1	The industrial development is situated approximately 400m to the west of the proposed DCO Order Limits of a proposed access point for the River Arun trenchless crossing. It is situated within the same catchment (that of Ryebank Rife). A simple qualitative

ID[12]	Development type	Development name	Application reference	Status	Confidence in assessment	Tier[13]	Distance to Rampion 2 (m)
							level of assessment is carried out (in **Table 26-34**) on the basis that a successful implementation of embedded and standard good industry practice measures will offset any potential significant effects.
21	Energy generation (solar) Installation of a Solar Photovoltaic (PV) generation system.	HM Prison Ford Road	F/16/21/PL	Application approved 23/11/2021	High	1	The site lies approximately 200m to the north-west of the proposed DCO Order Limits of an access point associated with the Proposed Development. A simple qualitative level of assessment is carried out (in **Table 26-34**) on the basis that a successful

ID[12]	Development type	Development name	Application reference	Status	Confidence in assessment	Tier[13]	Distance to Rampion 2 (m)
							implementation of embedded and standard good industry practice measures will offset any potential significant effects
24 / 61	Mixed use Construction of 1,500 residential dwellings, 60-bed care home, employment, local centre, retail and commercial floorspace, community and leisure centre.	Land at former Ford Airfield - Local Plan	F/4/20/OUT Local Plan site SD8	Application approved 30/05/2023 / Allocated within Arun District Council Local Plan	Yes	1	The Local Plan site and planning application for the land at the former Ford Airfield are at the same location but have varying spatial extents. The south-east boundary of the Local Plan area intersects the water environment ZOI and is approximately 750m north-west of an access point (Access 06) associated with the Proposed

ID[12]	Development type	Development name	Application reference	Status	Confidence in assessment	Tier[13]	Distance to Rampion 2 (m)
							Development. A simple qualitative level of assessment is carried out (in **Table 26-34**) on the basis that a successful implementation of embedded and standard good industry practice measures will offset any potential significant effects.
32	Mixed use development 600 dwellings and multi-functional green infrastructure	Development of land at Courtwick	LU/355/10/	Application approved 23/02/12	High	1	The site lies within the DCO Order Limits associated with the temporary construction corridor. A simple qualitative level of assessment is carried out (in **Table 26-34**) on the basis that a successful implementation of embedded and

ID[12]	Development type	Development name	Application reference	Status	Confidence in assessment	Tier[13]	Distance to Rampion 2 (m)
							standard good industry practice measures will offset any potential significant effects.
33	Residential development Construction of 114 dwellings and associated works	Land North of Toddington Lane	LU/347/14/RES	Application approved 01/09/2015	High	1	The property development is situated approximately 440m to the south of the onshore cable corridor on the opposite side of the Black Ditch watercourse. A simple qualitative level of assessment is carried out (in **Table 26-34**) on the basis that a successful implementation of embedded and standard good industry practice measures will offset

ID[12]	Development type	Development name	Application reference	Status	Confidence in assessment	Tier[13]	Distance to Rampion 2 (m)
							any potential significant effects.
36	Mixed Use 160 dwellings with public open space	Land off Arundel Road	A/122/19/OUT	Application approved 17/03/2020	High	1	The property development is situated approximately 200m to the south-east of the onshore cable corridor and on the opposite side of the Black Ditch watercourse. A simple qualitative level of assessment is carried out (in **Table 26-34**) on the basis that a successful implementation of embedded and standard good industry practice measures will offset any potential significant effects.

ID[12]	Development type	Development name	Application reference	Status	Confidence in assessment	Tier[13]	Distance to Rampion 2 (m)
39	Industry (resource extraction) The continued winning, working and processing of sand from the existing Rock Common Quarry.	Rock Common Quarry	WSCC/028/21	Application pending a decision: submitted 14/07/2021	High	1	The proposed extension to the existing quarry development overlaps slightly with the proposed temporary construction corridor. A simple qualitative level of assessment is carried out (in **Table 26-34**) on the basis that a successful implementation of embedded and standard good industry practice measures will offset any potential significant effects.
42	Industry (resource extraction) Continuation of working the mineral (sand	Sandgate Park Quarry	WSCC/044/18/SR	Application approved 08/01/2020	High	1	The proposed extension to the existing quarry development is situated approximately 90m

ID[12]	Development type	Development name	Application reference	Status	Confidence in assessment	Tier[13]	Distance to Rampion 2 (m)
	extraction), but with an enhanced restoration scheme for nature conservation and informal recreation						from a proposed access point for light construction access (Access 32). A simple qualitative level of assessment is carried out (in **Table 26-34**) on the basis that a successful implementation of embedded and standard good industry practice measures will offset any potential significant effects.
48	Energy storage Battery Energy Storage Facility	Battery Energy Storage Facility at Bolney	DM/21/0792	EIA Not Required 19/03/2021	Low	3	This battery storage facility is situated approximately 60m to the south of the proposed DCO Order Limits. A simple qualitative level of assessment is carried out (in **Table 26-34**)

ID[12]	Development type	Development name	Application reference	Status	Confidence in assessment	Tier[13]	Distance to Rampion 2 (m)
							on the basis that a successful implementation of embedded and standard good industry practice measures will offset any potential significant effects.
49	Energy storage Battery Energy Storage Facility at Bolney	Battery Energy Storage Facility at Bolney #2	DM/21/2276	Application pending a decision: submitted 14/06/2021	High	1	This battery storage facility is situated approximately 60m to the south of the proposed DCO Order Limits. A simple qualitative level of assessment is carried out (in **Table 26-34**) on the basis that a successful implementation of embedded and standard good industry practice measures will offset

ID[12]	Development type	Development name	Application reference	Status	Confidence in assessment	Tier[13]	Distance to Rampion 2 (m)
							any potential significant effects.
50	Energy storage Battery Energy Storage Facility	Battery Energy Storage System at Coombe Farm #3	DM/22/3228	Negative screening decision (EIA not required): decision 18/11/2022	Low	3	This battery storage facility is situated approximately 300m to the east of the proposed DCO Order Limits. A simple qualitative level of assessment is carried out (in **Table 26-34**) on the basis that a successful implementation of embedded and standard good industry practice measures will offset any potential significant effects.
51	Energy storage Proposed energy storage	Ghyll Farm	DM/20/2554	Negative screening decision (EIA not	Low	3	This storage facility is situated within the proposed DCO Order Limits and adjacent to

ID[12]	Development type	Development name	Application reference	Status	Confidence in assessment	Tier[13]	Distance to Rampion 2 (m)
	system and associated equipment			required): decision 06/08/2020			an access track associated with the existing National Grid Bolney Substation. A simple qualitative level of assessment is carried out (in **Table 26-34**) on the basis that a successful implementation of embedded and standard good industry practice measures will offset any potential significant effects.
52	Energy storage Battery Energy Storage Facility	Battery Energy Storage System at Coombe Farm #2	DM/22/0807	Negative screening decision (EIA not required): decision 29/03/2022	Low	3	This battery storage facility overlaps with the proposed DCO Order Limits. A simple qualitative level of assessment is carried out (in **Table 26-34)** on the basis that a successful

ID[12]	Development type	Development name	Application reference	Status	Confidence in assessment	Tier[13]	Distance to Rampion 2 (m)
							implementation of embedded and standard good industry practice measures will offset any potential significant effects.
53	Energy storage Battery Energy Storage Facility	Battery Energy Storage System at Coombe Farm	DM/21/1668	EIA Not Required 25/05/2021	Low	3	This battery storage facility overlaps with the proposed DCO Order Limits. A simple qualitative level of assessment is carried out (in **Table 26-34**) on the basis that a successful implementation of embedded and standard good industry practice measures will offset any potential significant effects.

ID[12]	Development type	Development name	Application reference	Status	Confidence in assessment	Tier[13]	Distance to Rampion 2 (m)
54	Energy generation (solar) Solarvoltaic panels and associated infrastructure	Land at Coombe Farm	DM/15/0644	Application approved 17/02/2017	High	1	This solar farm is situated approximately 25m to the east of the onshore cable corridor. A simple qualitative level of assessment is carried out (in **Table 26-34**) on the basis that a successful implementation of embedded and standard good industry practice measures will offset any potential significant effects.
56	Energy storage Battery Energy Storage Facility	Battery Energy Storage System at Coombe Farm #4	DM/23/0769	Application pending a decision: submitted 20/03/2023	High	1	This battery storage facility overlaps with the proposed DCO Order Limits. A simple qualitative level of assessment is carried out (in **Table**

ID[12]	Development type	Development name	Application reference	Status	Confidence in assessment	Tier[13]	Distance to Rampion 2 (m)
							26-34) on the basis that a successful implementation of embedded and standard good industry practice measures will offset any potential significant effects.
57	Utilities infrastructure (energy) Grid stability infrastructure	Grid Stability Infrastructure at the existing National Grid Bolney Substation	DM/21/4285	Negative screening decision (EIA not required): decision 14/01/2022	Low	3	This grid stability infrastructure overlaps with the DCO Order Limits. A simple qualitative level of assessment is carried out (in **Table 26-34**) on the basis that a successful implementation of embedded and standard good industry practice measures will offset any potential significant effects.

ID[12]	Development type	Development name	Application reference	Status	Confidence in assessment	Tier[13]	Distance to Rampion 2 (m)
58	Energy generation (solar) Solar PV system for domestic use	The Barns Solar System	DM/22/2749	Application approved 08/12/2022	High	1	The solar farm infrastructure is approximately 120m to the north-east of an access point for the Proposed Development (Access-65). A simple qualitative level of assessment is carried out (in **Table 26-34**) on the basis that a successful implementation of embedded and standard good industry practice measures will offset any potential significant effects.
59	Highways - creation of a 1.1km highway, with shared	Lyminster Bypass Scheme	WSCC/049/18/LY	Approved - under construction	High	1	The site is intersected by the proposed DCO Order Limits between Crossbush and Wick. A simple qualitative

ID[12]	Development type	Development name	Application reference	Status	Confidence in assessment	Tier[13]	Distance to Rampion 2 (m)
	cycleway and footway, Pegasus crossing, viaduct, culvert, wetland areas, balancing pond and swales, street lighting and associated works.						level of assessment is carried out (in **Table 26-34**) on the basis that a successful implementation of embedded and standard good industry practice measures will offset any potential significant effects.
60	Mixed use Proposed site that could provide up to 1,000 dwellings.	Littlehampton	LEGA/SD4 Site at West Bank (Policy H SP2b)	Allocated in Local Plan – No application at present.	Low	3	The allocated Local Plan site is approximately 550m east of the proposed DCO Order Limits associated with the onshore cable corridor. A simple qualitative level of assessment is carried out (in **Table 26-34**) on the basis that a

ID[12]	Development type	Development name	Application reference	Status	Confidence in assessment	Tier[13]	Distance to Rampion 2 (m)
							successful implementation of embedded and standard good industry practice measures will offset any potential significant effects.
64	Mixed use Around 7,000 dwellings, early years/new primary and secondary schools. Healthcare and other community facilities.	Local Plan site	Mayfield Proposal (SA414)	Proposed Local Plan site	Low	3	The proposed Local Plan Site is approximately 1.2km south of the proposed DCO Order Limits associated with the temporary construction corridor. A simple qualitative level of assessment is carried out (in **Table 26-34**) on the basis that a successful implementation of embedded and standard good industry practice

ID[12]	Development type	Development name	Application reference	Status	Confidence in assessment	Tier[13]	Distance to Rampion 2 (m)
							measures will offset any potential significant effects.

Table 26-33 Cumulative Project Design Envelope for water environment

Project phase and activity / impact	Scenario	Justification
Potential effects relating to the landfall and indicative onshore cable corridor during the construction, operation and maintenance and decommissioning phases	Each of the Tier 1 to 3 projects identified as needing a CEA in **Table 26-32**.	The potential effects identified in **Sections 26.9, 26.10** and **26.11** for the landfall and onshore cable corridor could be relevant as a result of the activities which are adjacent to and within the same surface water and groundwater catchments as the Proposed Development.

26.12.8 A further stage of the CEA is to carry out a simple qualitative assessment (as justified in **Table 26-32**) of the potential for any significant cumulative effects to arise. A CEA assessment is carried out in **Table 26-34**.

Table 26-34 Cumulative effects assessment for water environment

Project[14]	Discussion	Likely significant cumulative effect?
ID 1: Highways England, A27 Arundel Bypass (TR010045) Dual carriageway bypass	This project is at the pre-application stage awaiting the preferred route. The preferred alignment of the bypass crosses the River Arun approximately 2.7km upstream of a proposed trenchless crossing. There is likely be an overlap in timescales for the constriction and operational periods of the bypass, however, the scheme has been deferred to the next Roads Investment Period covering 2025 to 2030. It is assumed that good industry practice measures will be successfully implemented on site in accordance with the Drainage Manual Roads and Bridges (DMRB) (Highways England, 2021) to ensure there are no significant effects. On this basis, there is no potential for significant cumulative effects to arise.	No

[14] ID reference as stated in Table 2-1 in **Appendix 5.4: Cumulative effects assessment shortlisted developments, Volume 4** of the ES (Document Reference: 6.4.5.4) and on **Figure 5.4.2** to **5.4.4, Volume 4** of the ES (Document Reference: 6.4.5.4).

Project[14]	Discussion	Likely significant cumulative effect?
ID 13 / 14 / 63: Land at Climping (CM/48/21/RES / CM/1/17/OUT / Local Plan site (SD10)) Dwellings and public open space and ancillary works	The overall site area is approximately 26.7 / 27.15ha, which in the context of the River Arun catchment of 149,000ha within which it lies is small. The site lies adjacent to the proposed DCO Order Limits for a temporary construction compound associated with the Proposed Development. At present there are no confirmed demolition and construction dates for the Land at Climping project, therefore it is not certain that the potential impacts from the schemes will overlap. It is assumed that good industry practice measures will be successfully implemented on its site, such as CIRIA's Environmental Good Practice on Site (CIRIA, 2010), along with other mitigation measures set out within the FRA and Drainage Strategy Report (Bright Plan Civils, 2021) to ensure there are no significant effects. On this basis, there is no potential for significant cumulative effects to arise.	No
ID 16: Land west of Bridge Road Roundabout (LU/238/20/OUT) Demolition of existing treatment works and redevelopment to provide up to 105 homes	The overall site area is approximately 0.074ha, which in the context of the River Arun catchment (149,000ha) is small. The property development is situated approximately 220m from the onshore cable corridor and on the edge of the River Arun downstream of a trenchless crossing. At present, there are no confirmed demolition and construction dates for the Hampton Quay Holdings project, therefore it is not certain that the potential impacts from the schemes will overlap. It is assumed that best practice measures will be successfully implemented on their site, along with other mitigation measures set out within the FRA and Surface Water Drainage Statement (Ambiental, 2020) to ensure there are no significant effects. On this basis, there is no potential for significant cumulative effects to arise.	No
ID 20: Unit H6 Rudford Industrial Estate (CM/56/19/PL) Unit H6 Rudford Industrial Estate Industrial (materials): Erection &	The overall site area is approximately 0.2ha, which in the context of the Ryebank Rife catchment of 1,318ha is small. The non-residential development is situated approximately 500m to the north-west of the proposed DCO Order Limits of a proposed access point for the River Arun trenchless crossing. At present, there are no confirmed construction dates for the Rudford Industrial Estate project, therefore it is not certain that the potential impacts from the schemes will overlap. It is assumed	No

Project[14]	Discussion	Likely significant cumulative effect?
operation of concrete batching plant and distribution of concrete from the facility	that good industry practice measures will be successfully implemented on its site, to ensure there are no significant effects. On this basis, there is no potential for significant cumulative effects to arise.	
ID 21: HM Prison Ford Road (F/16/21/PL) Energy generation (solar): Installation of a Solar Photovoltaic (PV) generation system.	The overall site area is approximately 0.7ha, which in the context of the River Arun catchment of 149,000ha within which it lies is small. The site lies approximately 660m to the north-west of DCO Order Limits for an access point associated with the Proposed Development. At present, there are no confirmed demolition and construction dates for the HM Prison Ford project, therefore it is not certain that the potential impacts from the schemes will overlap. It is assumed that good industry practice measures will be successfully implemented on its site, such as CIRIA's Environmental Good Practice on Site (CIRIA, 2010), and the Phase II Geo-environmental investigation report (Caledonian, 2021) to ensure there are no significant effects. On this basis there is no potential for significant cumulative effects to arise.	No
ID 24 / 61: Land at Former Ford Airfield **Arun Local Plan & Planning Application F/4/20/OUT** Mixed use: construction of 1,500 dwellings, care home, employment, retail and commercial floorspace, community centre.	The overall area for the land at the former Ford Airfield within the Arun Local Plan is approximately 113ha and the area for the planning application is 89ha, which in the context of the River Arun catchment (149,000ha) is small. The land at the former Ford Airfield is approximately 750m from the Proposed Development. However, it is assumed that good industry practice measures will be successfully implemented on the site, such as CIRIA's Environmental Good Practice on Site (CIRIA, 2010) along with other mitigation measures set out within the planning application Flood Risk Assessment and Drainage Strategy (JNP GROUP, 2021), to ensure there are no significant effects. On this basis, there is no potential for significant cumulative effects to arise.	No
ID 32: Development of	The overall site area is approximately 33.9ha, which in the context of the River Arun catchment of 149,000ha within which it lies is small. The site lies adjacent to the	No

Project[14]	Discussion	Likely significant cumulative effect?
land at Courtwick (LU/355/10) Mixed use development, 600 dwellings and multi- functional green infrastructure	DCO Order Limits associated with the temporary construction corridor. At present, there are no confirmed demolition and construction dates for the Development of land at Courtwick project, therefore it is not certain that the potential impacts from the schemes will overlap. It is assumed that good industry practice measures will be successfully implemented on its site, such as CIRIA's Environmental Good Practice on Site (CIRIA, 2010), and the Hydrology and Flood Risk ES assessment (Stuart Michael Associates, 2010) to ensure there are no significant effects. On this basis, there is no potential for significant cumulative effects to arise.	
ID 33: Land North of Toddington Lane (LU/347/14/RES) Residential development 114 **dwellings and associated works**	The overall site area is approximately 3.7ha, which in the context of the Black Ditch catchment of 2,821ha is small. The property development is situated approximately 440m from the proposed DCO Order Limits on the opposite side of the Black Ditch watercourse. At present, there are no confirmed demolition and construction dates for the Land North of Toddington Lane project, therefore it is not certain that the potential impacts from the schemes will overlap. It is assumed that best practice measures will be successfully implemented on their site, along with other mitigation measures set out within the Surface Water Drainage Strategy (Glanville, 2014) to ensure there are no significant effects. On this basis, there is no potential for significant cumulative effects to arise.	No
ID 36: Land off Arundel Road (A/122/19/OUT) 160 dwellings with public open space	The overall site area is approximately 9.10ha, which in the context of the Black Ditch catchment of 2,821ha is small. The property development is situated approximately 210m from the proposed DCO Order Limits and on the opposite side of the Black Ditch watercourse. At present, there are no confirmed demolition and construction dates for the Land off Arundel project, therefore it is not certain that the potential impacts from the schemes will overlap. It is assumed that best practice measures will be successfully implemented on their site, along with other mitigation measures set out within the Flood Risk Assessment and Outline Surface Water Drainage Strategy (RSK, 2019) to ensure there are no significant	No

Project[14]	Discussion	Likely significant cumulative effect?
	effects. On this basis, there is no potential for significant cumulative effects to arise.	
ID 39: Rock Common Quarry (WSCC/028/21) Industry (resource extraction): Mineral (sand) extraction	The overall site area is approximately 34ha, which in the context of the Honeybridge Stream catchment (2,287ha) is small. The proposed extension to the existing quarry development overlaps with a small area of the proposed temporary construction corridor. At present, there are no confirmed construction and operational dates for the Rock Common Quarry project, therefore it is not certain that the potential impacts from the schemes will overlap. It is assumed that best practice measures will be successfully, along with other mitigation measures set out within the Planning and Environmental Statement (Terrestria Limited 2021) to ensure there are no significant effects. On this basis, there is no potential for significant cumulative effects to arise.	No
ID 42: Sandgate Park Quarry (WSCC/044/18/SR) Industry (resource extraction): Mineral (sand) extraction with enhanced restoration scheme	The overall site area is approximately 34ha, which in the context of the River Stor Headwaters catchment (671ha) is small. The development is situated approximately 90m from an access point for light construction access. At present, there are no confirmed construction and operational dates for the Sandgate Park Quarry project, therefore it is not certain that the potential impacts from the schemes will overlap. It is assumed that best practice measures will be successfully implemented on their site, along with other mitigation measures set out within the Hydrogeological Risk Assessment (ESI, 2018) to ensure there are no significant effects. On this basis, there is no potential for significant cumulative effects to arise.	No
ID48: Battery Energy Storage Facility at Bolney (DM/21/0792) Energy storage: Battery Energy Storage Facility	The overall site area is approximately 6.9ha, which in the context of the Adur East (Sakeham) catchment (861ha) is small. This battery storage facility is situated approximately 130m to the south of the proposed DCO Order Limits. It is assumed that good industry practice measures will be successfully implemented on this site, such as CIRIA's Environmental Good Practice on Site (CIRIA, 2010), to ensure there are no significant effects.	No

Project[14]	Discussion	Likely significant cumulative effect?
	On this basis, there is no potential for significant cumulative effects to arise.	
ID 49: Development of a battery energy storage facility and associated infrastructure (DM/21/2276) Energy storage: Battery Energy Storage Facility at Bolney	The overall site area is approximately 7.2ha, which in the context of the Adur East (Sakeham) catchment (861ha) is small. This battery storage facility is situated approximately 130m to the south of the proposed DCO Order Limits. It is assumed that good industry practice measures will be successfully implemented on this site, such as CIRIA's Environmental Good Practice on Site (CIRIA, 2010), to ensure there are no significant effects. On this basis, there is no potential for significant cumulative effects to arise.	No
ID 50: Battery Energy Storage System at Coombe Farm #3 (DM/22/3228) Energy storage: Battery Energy Storage Facility	The overall site area is approximately 1.2ha, which in the context of the Adur East (Sakeham) catchment (862ha) is small. This battery storage facility is situated approximately 350m to the east of the onshore cable corridor. It is assumed that good industry practice measures will be successfully implemented on this site, such as CIRIA's Environmental Good Practice on Site (CIRIA, 2010), to ensure there are no significant effects. On this basis, there is no potential for significant cumulative effects to arise.	No
ID 51: Ghyll Farm (DM/20/2554) Energy storage: Proposed energy storage system and associated equipment	The overall site area is approximately 1.9ha, which in the context of the Adur East (Sakeham) catchment (862ha) is small. This battery storage facility is situated approximately 40m to the south of the proposed DCO Order Limits and adjacent to an access track associated with the existing National Grid Bolney Substation. It is assumed that good industry practice measures will be successfully implemented on this site, such as CIRIA's Environmental Good Practice on Site (CIRIA, 2010), to ensure there are no significant effects. On this basis, there is no potential for significant cumulative effects to arise.	No
ID 52: Battery Energy Storage System at Coombe Farm #2	The overall site area is approximately 5.3ha, which in the context of the Adur East (Sakeham) catchment (862ha) is small. This battery storage facility overlaps with a small part of the proposed DCO Order Limits. It is	No

Project[14]	Discussion	Likely significant cumulative effect?
(DM/22/0807) Energy storage: Battery Energy Storage Facility	assumed that good industry practice measures will be successfully implemented on this site, such as CIRIA's Environmental Good Practice on Site (CIRIA, 2010), to ensure there are no significant effects. On this basis, there is no potential for significant cumulative effects to arise.	
ID 53: Battery Energy Storage System at Coombe Farm (DM/21/1668) Energy storage: Battery Energy Storage Facility	The overall site area is approximately 4.8ha, which in the context of the Adur East (Sakeham) catchment (862ha) is small. This battery storage facility overlaps with a small part of the proposed DCO Order Limits. It is assumed that good industry practice measures will be successfully implemented on this site, such as CIRIA's Environmental Good Practice on Site (CIRIA, 2010), to ensure there are no significant effects. On this basis, there is no potential for significant cumulative effects to arise.	No
ID 54: Land at Coombe Farm, Bob Lane, Twineham (DM/15/0644) Energy generation (solar): Solarvoltaic cells and infrastructure	The overall site area is approximately 44.5ha, which in the context of the Adur East (Sakeham) catchment (862ha) is small. This solar farm is situated approximately 30m to the north-east of the onshore cable corridor. It is assumed that good industry practice measures will be successfully implemented on this site, along with other mitigation measures set out within the FRA (Clarkebond, 2015) to ensure there are no significant effects. On this basis, there is no potential for significant cumulative effects to arise.	No
ID 56: Battery Energy Storage System at Coombe Farm #4 (DM/23/0769) Energy storage: Battery Energy Storage Facility	The overall site area is approximately 11.5ha, which in the context of the Adur East (Sakeham) catchment (862ha) is small. This battery storage facility overlaps with a small part of the proposed temporary construction corridor. It is assumed that good industry practice measures will be successfully implemented on this site, such as CIRIA's Environmental Good Practice on Site (CIRIA, 2010), to ensure there are no significant effects. On this basis, there is no potential for significant cumulative effects to arise.	No
ID 57: Grid Stability	The overall site area is approximately 4ha, which in the context of the Adur East (Sakeham) catchment (862ha)	No

Project[14]	Discussion	Likely significant cumulative effect?
Infrastructure at the existing National Grid Bolney Substation (DM/21/4285) Utilities infrastructure (energy): Grid stability infrastructure	is small. This grid stability infrastructure overlaps with a small part of the proposed temporary construction corridor and is assumed that good industry practice measures will be successfully implemented on this site, such as CIRIA's Environmental Good Practice on Site (CIRIA, 2010), to ensure there are no significant effects. On this basis, there is no potential for significant cumulative effects to arise.	
ID 58: The Barns Solar System - Solar PV system for domestic use (DM/22/2749) Energy generation (solar): Solar PV system for domestic use	The overall site area is approximately 0.08ha which in the context of the Adur East (Sakeham) catchment (862ha) is small. The solar farm infrastructure is approximately 120m to the north-east of an access point for the Proposed Development (Access-65), and it is assumed that good industry practice measures will be successfully implemented on this site, such as CIRIA's Environmental Good Practice on Site (CIRIA, 2010), to ensure there are no significant effects. On this basis, there is no potential for significant cumulative effects to arise.	No
ID: 59 Lyminster Bypass Scheme	The overall site area is approximately 13ha, which in the context of the Black Ditch catchment of 2,821ha is small. The development intersects the proposed DCO Order Limits, however site completion is currently forecasted for Autumn 2024, therefore it is unlikely that the potential impacts from the schemes will overlap. It is assumed that best practice measures will be successfully implemented on their site, along with other mitigation measures set out within the Flood Risk Assessment (WSP, 2018) to ensure there are no significant effects. On this basis, there is no potential for significant cumulative effects to arise.	No
ID 60: Arun Local Plan – Site at West Bank Mixed use: proposed site that	The overall site area is approximately 48ha, which in the context of the Ryebank Rife catchment (1,318ha) is small. The site partly overlaps with the proposed DCO Order Limits associated with the temporary construction corridor, however, it is assumed that good industry practice measures will be successfully implemented on	No

Project[14]	Discussion	Likely significant cumulative effect?
could provide up to 1,000 dwellings	this site, such as CIRIA's Environmental Good Practice on Site (CIRIA, 2010), to ensure there are no significant effects. On this basis, there is no potential for significant cumulative effects to arise.	
ID 64: Horsham Local Plan SITE - Mayfield Proposal (SA414) Around 7,000 dwellings, early years/new primary and secondary schools. Healthcare and other community facilities	The overall site area is approximately 310ha, which in the context of the River Adur catchment (6159ha) is small. The Local Plan site is approximately 1.2km to the south of the proposed DCO Order Limits associated with the temporary construction corridor. It is assumed that good industry practice measures will be successfully implemented on this site, such as CIRIA's Environmental Good Practice on Site (CIRIA, 2010), to ensure there are no significant effects. On this basis, there is no potential for significant cumulative effects to arise.	No

26.13 Transboundary effects

26.13.1 Transboundary effects arise when impacts from a development within one European Economic Area (EEA) states affects the environment of another EEA state(s). A screening of transboundary effects has been carried out and is presented in Appendix B of the Scoping Report (RED, 2020). There are no transboundary effects upon other EEA states relevant to the water environment aspect, and therefore these are not considered any further as part of this chapter.

26.14 Inter-related effects

26.14.1 The inter-related effects assessment considers likely significant effects from multiple impacts and activities from the construction, operation and maintenance and decommissioning phases of Rampion 2 on the same receptor, or group of receptors.

26.14.2 Inter-related effects could potentially arise in one of two ways. The first type of inter-related effect is a Proposed Development lifetime effect, where multiple phases of the Proposed Development interact to create a potentially more significant effect on a receptor than in one phase alone. The phases for Rampion 2 are construction, operation and maintenance, and decommissioning. All Proposed Development lifetime effects are assessed in **Chapter 30: Inter-related effects, Volume 2** (Document Reference: 6.2.30).

26.14.3 The second type of inter-related effect is receptor-led effects. Receptor-led effects are where effects from different environmental aspects combine spatially and temporally on a receptor. These effects may be short-term, temporary, transient, or longer-term. Receptor-led effects have been considered, where relevant, in this chapter. Full results of the receptor-led effects assessment can be found in **Chapter 30: Inter-related effects, Volume 2** of the ES (Document Reference: 6.2.30).

26.15 Glossary of terms and abbreviations

Table 26-35 Glossary of terms and abbreviations

Term (acronym)	Definition
Abstraction	Removal of water from surface water or groundwater
ADC	Arun District Council
Alluvium	Material transported by rivers and deposited along its course
Annual Exceedance Probability	In flood risk management, the likelihood of a rainfall total, runoff or flow rate of a certain magnitude being exceeded each year
AStGWF	Areas Susceptible to Groundwater Flooding
AWDC	Adur and Worthing District Council
Baseline	Refers to existing conditions as represented by latest available survey and other data which is used as a benchmark for making comparisons to assess the impact of development.
Baseline conditions	The environment as it appears (or would appear) immediately prior to the implementation of the Proposed Development together with any known or foreseeable future changes that will take place before completion of the Proposed Development.
BFI	Base Flow Index
BGS	British Geological Survey
BS	British Standards
Bund	A barrier, dam or mound used to contain or exclude water (or other liquids). Can either refer to a bund made from earthworks material, sand etc. or a metal / concrete structure surrounding, for example, a fuel tank
CBS	Cement Bound Sand
CEH	Centre of Ecology and Hydrology

Term (acronym)	Definition
CIRIA	Construction Industry Research and Information Association
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
Construction Effects	Used to describe both temporary effects that arise during the construction phases as well as permanent existence effects that arise from the physical existence of development (for example new buildings)
COs	Conservation Objectives
Cumulative effects	Additional changes caused by a Proposed Development in conjunction with other similar developments or as a combined effect of a set of developments, taken together
Cumulative Effects Assessment (CEA)	Assessment of impacts as a result of the incremental changes caused by other past, present and reasonably foreseeable human activities and natural processes together with the Proposed Development.
CWS	County Wildlife Site
DCLG	Department for Communities and Local Government
DCO Application	An application for consent under the Planning Act 2008 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
DECC	Department of Energy and Climate Change
Decommissioning	The period during which a development and its associated processes are removed from active operation
Defra	Department for Environment, Food and Rural Affairs
DESNZ	Department for Energy Security and Net Zero
Development Consent Order (DCO)	This is the means of obtaining permission for developments categorised as Nationally Significant Infrastructure Projects, under the Planning Act 2008
Discharge	Release of effluent waste into a watercourse or water body

Term (acronym)	Definition
DMRB	Design Manual for Roads and Bridges
DTM	Digital Terrain Model
DWPAs	Drinking Water Protected Areas
EEA	European Economic Area
Embedded environmental measures	Equate to 'primary environmental measures' as defined by Institute of Environmental Management and Assessment (2016). They are measures to avoid or reduce environmental effects that are directly incorporated into the preferred masterplan for the Proposed Development
EN	Electricity Networks
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')
EMS	Environmental Management Systems
Environmental Measures	Measures which are proposed to prevent, reduce and where possible offset any significant adverse effects (or to avoid, reduce and if possible, remedy identified effects
Environmental Statement (ES)	The written output presenting the full findings of the Environmental Impact Assessment
ERPs	Emergency Response Plans
Evidence Plan Process (EPP)	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
FRA	Flood Risk Assessment
FRAP	Flood Risk Activity Permits
Future Baseline	Refers to the situation in future years without the Proposed Development
GDPR	General Data Protection Regulations
GPPs	Guidance for Pollution Prevention
GWDTE	Groundwater Dependent Terrestrial Ecosystem
GWMU	Groundwater Management Unit

Term (acronym)	Definition
Ha	Hectares
HDC	Horsham District Council
Horizontal Directional Drill (HDD)	An engineering technique avoiding open trenches.
IDB	Internal Drainage Board
Impact	The changes resulting from an action
Impact pathway	A change descriptively assessed by one aspect, used by another aspect to inform a related assessment
Indirect effects	"Effects that result indirectly from the Proposed Development as a consequence of the direct effects, often occurring away from the site, or as a result of a sequence of interrelationships or a complex pathway. They may be separated by distance or in time from the source of the effects. Often used to describe effects on landscape character that are not directly impacted by the Proposed Development such as effects on perceptual characteristics and qualities of the landscape."
IPC	Infrastructure Planning Commission
LACR	Longer Alternative Cable Route
LFRMS	Local Flood Risk Management Strategy
LGS	Local Geological Site
Likely Significant Effects	It is a requirement of Environmental Impact Assessment Regulations to determine the likely significant effects of the Proposed Development on the environment which should relate to the level of an effect and the type of effect
LLFA	Lead Local Flood Authority
LNR	Local Nature Reserve
LPA	Local Planning Authority
LWS	Local Wildlife Site
MAFF	Ministry of Agriculture, Fisheries and Food (now Defra)
MAGIC	Multi-Agency Geographic Information for the Countryside

Term (acronym)	Definition
Magnitude (of change)	A term that combines judgements about the size and scale of the effect, the extent of the area over which it occurs, whether it is reversible or irreversible and whether it is short term or long term in duration.' Also known as the 'degree' or 'nature' of change
mAOD	Metres above Ordnance Datum
mbgl	Metres below ground level
Met. Office	Meteorological Office
MHCLG	Ministry of Housing, Communities and Local Government
MHWS	Mean high-water springs
MLWS	Mean low-water springs
MMO	Marine Management Organisation
Outline MMP	Outline Materials Management Plan
MSDC	Mid Sussex District Council
Nationally Significant Infrastructure Project (NSIP)	Nationally Significant Infrastructure Projects are major infrastructure developments in England and Wales which are consented by DCO. These include proposals for renewable energy projects with an installed capacity greater than 100MW.
NGR	National Grid Reference
NNR	National Nature Reserve
Non-statutory consultation	Non-statutory consultation refers to the voluntary consultation that RED undertake in addition to the Statutory Consultation requirements
NPPF	National Planning Policy Framework
NPS	National Policy Statement
NRFA	National River Flow Archive
NVZ	Nitrate Vulnerable Zones
Onshore part of the proposed DCO Order Limits	An area that encompasses all planned onshore infrastructure
OS	Ordnance Survey

Term (acronym)	Definition
OWC	Ordinary Watercourse Consent
Particulate Matter	Microscopic portions of solid matter suspended in air. PM_{10} - microscopic particles with an aerodynamic diameter of 10 microns or less– $PM_{2.5}$ - microscopic particles with an aerodynamic diameter of 2.5 microns or less
PICP	Pollution Incident Control Plan
PIRP	Pollution Incident Response Plan
PPG	Pollution Prevention Guidance
PPPs	Pollution Prevention Plans
Preliminary Environmental Information Report (PEIR)	The written output of the Preliminary Environmental Impact Assessment undertaken for the Proposed Development. It is developed to support Statutory Consultation and presents the preliminary findings of the assessment to allow an informed view to be developed of the Proposed Development, the assessment approach that has been undertaken, and the preliminary conclusions on the likely significant effects of the Proposed Development and environmental measures proposed
Preliminary Environmental Information Report Supplementary Information Report (PEIR SIR)	The PEIR Supplementary Information Report (SIR) identified and provided additional supporting preliminary environmental information associated with proposed alternatives and modifications to the onshore part of the original PEIR Assessment Boundary which have been identified since the publication of the original PEIR (RED, 2021) in July 2021
Preliminary Environmental Information Report Further Supplementary Information Report (PEIR FSIR)	The PEIR Further Supplementary Information Report (FSIR) identified and provided further preliminary environmental information associated with the proposed alternative route option identified since the publication of the original PEIR and PEIR SIR in July 2021 and October 2022 respectively (RED, 2021; 2022)
Proposed DCO Order Limits	Proposed DCO Order Limits combines the areas 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
Proposed Development	The development that is subject to the application for development consent, as described in **Chapter 4: The**

Term (acronym)	Definition
	Proposed Development, Volume 2 of the ES (Document Reference: 6.2.4).
PROW	Public Rights of Way
PS	Public Supply
PWS	Private Water Supply
Q_{95}	Flow rate is refer to as 'Q', and the exceedance value as a subscript number, so Q_{95} means the flow rate equalled or exceeded for 95 percent of the time
RAMSAR	Ramsar Convention on Wetlands
RBMP	River Basin Management Plan
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
RoFSW	Risk of Flooding from Surface Water
S	Storage Coefficient
SAC	Special Area of Conservation
SCC	Somerset County Council
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
SDNPA	South Downs National Park Authority
Secretary of State	The Minister for Department for Energy Security and Net Zero (DESNZ).
Sensitivity	A term applied to specific receptors, combining judgements of the susceptibility of the receptor to the specific type of change or development proposed and the value associated to that receptor.
SIR	Supplementary Information Rep

Term (acronym)	Definition
SFRA	Strategic Flood Risk Assessment
Significance	A measure of the importance of the environmental effect, defined by criteria specific to the environmental aspect.
Significant effects	It is a requirement of the EIA Regulations 2017 to determine the likely significant effects of the development on the environment which should relate to the level of an effect and the type of effect. Where possible significant effects should be mitigated. The significance of an effect gives an indication as to the degree of importance (based on the magnitude of the effect and the sensitivity of the receptor) that should be attached to the impact described. Whether or not an effect should be considered significant is not absolute and requires the application of professional judgement. Significant – 'noteworthy, of considerable amount or effect or importance, not insignificant or negligible.' The Concise Oxford Dictionary. Those levels and types of landscape and visual effect likely to have a major or important / noteworthy or special effect of which a decision maker should take particular note.
SPA	Special Protection Area
SPZ	Source Protection Zone
SSSI	Site of Special Scientific Interest
Statutory Consultation	Statutory Consultation that is required under Section 42 and Section 47 of the Planning Act 2008 with the relevant consultation bodies and the public on the preliminary environmental information
Storage Coefficient	The volume of water released from storage in an aquifer per unit surface area per unit decrease in the hydraulic head
STP	Sewage Treatment Plant
SuDS	Sustainable Drainage Systems
Temporal Scope	The temporal scope covers the time period over which changes to the environment and the resultant effects are predicted to occur and are typically defined as either being temporary or permanent.
Temporary or permanent effects	Effects may be considered as temporary or permanent. In the case of wind energy development the application is for a 30-year

Term (acronym)	Definition
	period after which the assessment assumes that decommissioning will occur and that the site will be restored. For these reasons, the development is referred to as long term and reversible.
The Applicant	Rampion Extension Development Limited (RED)
The Proposed Development / Rampion 2	The onshore and offshore infrastructure associated with the offshore wind farm located in the English Channel in off the south coast of England.
TJB	Transition Joint Bay
TraC	Transitional and Coastal
Transmissivity	Describes the ability of the aquifer to transmit groundwater throughout its entire saturated thickness
UKCEH	United Kingdom Centre for Ecology and Hydrology
UKCP	UK Climate Projections
WFD	Water Framework Directive
WSCC	West Sussex County Council
Zone of Influence (ZOI)	The area surrounding the Proposed Development which could result in likely significant effects.

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Rampion 2
WIND FARM