Rampion 2 Wind Farm

Category 6: Environmental Statement

Volume 2, Chapter 24: Ground conditions (tracked)

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A	04/08/2023	Final for DCO submission	WSP	RED	RED
B	01/08/2024	Deadline 6 updates including commitments and errata	WSP	RED	RED

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Executive Summary

This section summarises the assessment findings for ground conditions, based on **Chapter 24: Ground conditions, Volume 2** of the ES (Document Reference: 6.2.24).

How effects on ground conditions have been assessed

The assessment has considered the likely significant effects of the Proposed Development on ground conditions, including land contamination, geohazards such as unstable ground conditions and settlement, and geodiversity, which includes, for example, Sites of Special Scientific interest (SSSI) designated for their geology. Potential effects which have been assessed include the temporary construction workforce encountering contamination during intrusive works and accidental spillages and leaks occurring from temporary construction plant.

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

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

Baseline environment

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

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

There are no geological SSSIs present within the Study Area. Two Locally Important Geological Sites (LIGSs) are present within the Study Area. There are also a number of potential sources of contamination in the area of the Proposed Development: historical and authorised landfills, a sewage treatment works, infilled ground, industrial estates and the existing National Grid Bolney Substation.

Embedded environmental measures

A range of environmental measures within the **Commitments Register** (Document Reference: 7.22) which relate to ground conditions are embedded as part of the Rampion 2 design to remove or reduce significant environmental effects as far as possible. Examples of these embedded environmental measures include the following:

- avoiding sensitive sites (including landfills and areas of potential contamination) by the project footprint where practical (C-6);
- implementation of pollution prevention measures as part of the **Outline Code of the Construction Practice (CoCP)** (Document Reference: 7.2) (C-72, C-76, C-151 and C-167); and
- ensuring that the land used for the Proposed Development is suitable for the proposed use with respect to the potential for soil and groundwater contamination and, where necessary, undertaking risk-based remediation during construction (C-71).

Likely significant effects

Overview

Based on the proposed location of the onshore substation and routing of the onshore cable corridor, plus the implementation of embedded environmental measures contained within the **Outline CoCP** (Document Reference: 7.2), no significant effects have been identified on land contamination during the construction, operation and maintenance, and decommissioning phases. A significant effect has been identified for minerals safeguarding during the construction phase.

Cumulative effects

No significant cumulative effects have been identified in relation to the Proposed Development on ground conditions during the construction, operation and maintenance, and decommissioning phases.

Inter-related effects

No significant inter-related effects of greater significance compared to the effects considered alone were identified for ground conditions receptors during the construction, operation and maintenance, and decommissioning phases of the Proposed Development.

Transboundary effects

No significant transboundary effects have been identified in relation to the Proposed Development on ground conditions receptors during the construction, operation and maintenance, and decommissioning phases.

24. Ground conditions

24.1 Introduction

24.1.1 This chapter of the Environmental Statement (ES) presents the results of the assessment of the likely significant effects of Rampion 2 with respect to ground conditions, including land contamination, geohazards, geodiversity and minerals safeguarding landward of mean high water springs (MHWS). 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 20: Soils and agriculture, Volume 2** of the ES (Document Reference: 6.2.20) for assessment of potentially significant effects with respect to soil resources and soil structure;
- **Chapter 22: Terrestrial ecology and nature conservation, Volume 2** of the ES (Document Reference: 6.2.22) for assessment of impacts on designated sites including those that are dependent on the water environment (but excluding sites designated for their geological importance which are addressed in this Chapter); and
- **Chapter 26: Water environment, Volume 2** of the ES (Document Reference: 6.2.26) for assessment of potentially significant effects with respect to groundwater and surface water levels, flows and interactions including flood risk receptors and effects of construction dewatering.

24.1.2 This technical chapter describes:

- the legislation, planning policy and other documentation that has informed the assessment (**Section 24.2: Relevant legislation, planning policy, and other documentation**);
- the outcome of consultation and engagement that has been undertaken to date, including how matters relating to ground conditions within the Statutory Consultation, have been addressed (**Section 24.3: Consultation and engagement**);
- the scope of the assessment for ground conditions (**Section 24.4: Scope of the assessment**);
- the methods used for the baseline data gathering (**Section 24.5: Methodology for baseline data gathering**);
- the overall baseline (**Section 24.6: Baseline conditions**);
- embedded environmental measures relevant to ground conditions and the relevant maximum design scenario (**Section 24.7: Basis for ES assessment**);
- the assessment methods used for the ES (**Section 24.8: Methodology for ES assessment**);

- the assessment of ground conditions effects (**Section 24.9- 24.11: Assessment of effects** and **Section 24.12: Assessment of cumulative effects**);
- consideration of transboundary effects (**Section 24.13: Transboundary effects**);
- inter-related effects (**Section 24.14: Inter-related effects**);
- a summary of residual effects for ground conditions (**Section 24.15: Summary of residual effects**);
- a glossary of terms and abbreviations is provided in **Section 24.16: Glossary of terms and abbreviations**; and
- a references list is provided in **Section 24.17: References**.

24.1.3 The chapter is also supported by **Appendix 24.1: Phase 1 geo-environmental desk study, Volume 4** of the ES (Document Reference: 6.4.24.1).

24.2 Relevant legislation, planning policy and other documentation

Introduction

24.2.1 This section identifies the relevant legislation, policy and other documentation that has informed the assessment of effects with respect to ground conditions. 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

24.2.2 **Table 24-1** lists the legislation relevant to the assessment of the effects on ground conditions receptors.

Table 24-1 Legislation relevant to ground conditions

Legislation description	Relevance to assessment
European Union Groundwater Directive (2006/118/EC), 2006	
The aim of the European Union Groundwater Directive 2006 is to protect groundwater against pollution caused by dangerous substances. The directive continues to have effect in England following the end of the Brexit Transition Period.	The potential for Rampion 2 to have an effect on groundwater bodies through the introduction of dangerous substances during the construction and operation and maintenance phases requires assessment. Appropriate embedded environmental measures have been put in place as detailed in **Table 24-14** in **Section 24.7** of

Legislation description	Relevance to assessment
	this chapter to help ensure the protection of groundwater.
Water Resources Act 1991 as amended by the Water Act 2003	
The Water Resources Act 1991 makes provisions such that it is an offence to cause or knowingly permit polluting, noxious, poisonous or any solid waste matter to enter controlled waters. **The Water Resources Act 1991 was revised by the Water Act 2003, which provides the definition of and regulatory controls for the protection of water resources, including the quality standards expected for controlled waters.**	The Water Act 2003 sets out the definition of controlled waters which have been used to define the scope of receptors for the assessment in **Section 24.4**. Appropriate embedded environmental measures have been put in place as detailed in **Table 24-14** in **Section 24.7** of this chapter to help ensure the protection of controlled waters.
The Environmental Protection Act 1990	
Part 2 of the Environmental Protection Act 1990 makes provision for the improved control of pollution arising from certain industrial and other processes. Part 2A of the Act provides the regulatory basis for the identification, designation, and remediation of contaminated land.	The potential for Rampion 2 to be built on land potentially affected by historical contamination requires assessment to ensure it is suitable for the proposed land-use and that, where necessary, remediation is carried out to ensure the land cannot be determined as Contaminated Land under the Environmental Protection Act 1990. The approach to incorporating the requirements of the Act is outlined in **Section 24.8**.
Environmental Damage (Prevention and Remediation) (England) Regulations 2015	
The Environmental Damage (Prevention and Remediation) (England) Regulations 2015 implement the European Union (EU) directive on environmental liability (The Environmental Liability Directive, Directive 2004/35/EC) setting out the principles for prevention and remedy of environmental damage.	Construction and operation and maintenance activities associated with Rampion 2 have the potential to cause pollution. The regulations place emphasis on businesses to proactively implement pollution prevention measures so that damage to the environment does not arise. Appropriate embedded environmental measures have been put in place as detailed in **Table 24-14** in **Section 24.7** of

Legislation description	Relevance to assessment
	this chapter to help ensure the prevention of pollution.
Health and Safety at Work etc. Act 1974	
The Health and Safety at Work etc. Act 1974 and regulations made under the Act places responsibilities upon employers to carry out a risk assessment for every work activity and to document it. Besides carrying out a risk assessment, the Act makes provisions for employers also needing to: make arrangements for implementing the health and safety measures identified as necessary by the risk assessment; appoint competent people to help them implement the arrangements; set up emergency procedures; provide clear information and training to employees; and work together with other employers sharing the same workplace.	Land contamination poses a hazard to groundworkers and potentially others in proximity to the construction work. Appropriate risk assessments must be carried out and arrangements made to protect the health and safety of workers directly involved in groundworks for Rampion 2 and other human receptors who could be affected. The consideration of how the requirements of the Act relate to ground conditions effects in relation to the temporary construction activities is addressed in **Section 24.9**.
The Construction (Design and Management) (CDM) Regulations 2015	
The CDM Regulations 2015 place specific duties on clients, designers and contractors, so that health and safety is considered throughout the life of a construction project from its inception to its subsequent final demolition and removal. **The CDM Regulations 2015 require the appointment of a Principal Designer and Principal Contractor to co-ordinate health and safety aspects during construction.** **Under the provisions set out in the CDM Regulations 2015, designers must avoid foreseeable risks so far as reasonably practicable by: eliminating hazards from the construction, cleaning, maintenance, and proposed use and demolition of a structure; reducing risks from any remaining hazard; and**	Construction of Rampion 2 will fall under the requirements of the CDM Regulations 2015 requiring consideration of health and safety to be incorporated into the design of the Rampion 2 components and during the construction phase. The consideration of how the requirements of the CDM Regulations relate to ground conditions effects in relation to the temporary construction activities is addressed in **Section 24.9**.

Legislation description	Relevance to assessment
giving collective safety measures priority over individual measures.	

24.2.3 **Table 24-2** lists the national planning policy relevant to the assessment of the effects on ground conditions receptors.

Table 24-2 National planning policy relevant to ground conditions

Policy description	Relevance to assessment
Overarching National Policy Statement (NPS) for Energy (EN-1) (Department for Energy and Climate Change (DECC), 2011a)	
Overarching NPS EN-1 for Energy (DECC, 2011a) includes guidance on what matters are to be considered in the assessment of renewable energy projects including the potential effects in relation to geological conservation. **With regard to paragraphs 5.3.3, the ES will need to demonstrate that effects on internationally, nationally, and locally designated sites of geological conservation importance have been identified.** **With regard to paragraph 5.10.8, where development occurs on previously developed land, the ES will need to demonstrate consideration of the risk posed by land contamination.** **With regard to paragraph 5.10.22, where development has an impact upon a Mineral Safeguarding Area (MSA), appropriate mitigation measures should be put in place to safeguard mineral resources.**	Locally designated geological sites have been identified as part of the baseline as set out in **Section 24.6**, and this chapter considers the potential impact of Rampion 2 on geological sites in **Sections 24.9** to **24.14**. The scope of the ground conditions assessment set out in **Section 24.4** considers the risks from land contamination on and adjacent to the proposed DCO Order Limits. This chapter considers the potential impact of Rampion 2 on minerals resources and MSAs in **Sections 24.9** to **24.14**.
National Planning Policy Framework, (NPPF) (Ministry of Housing, Communities and Local Government (MHCLG), 2021)	
The NPPF sets out the Government's planning policies for England and how these should be applied. It provides a framework within which locally prepared plans for housing and other development can be produced. With regard to	The approach to the assessment of potentially significant ground conditions effects, including effects on mineral resources is addressed in **Section 24.8** and includes reference to relevant legislation

Policy description	Relevance to assessment
paragraphs 120, 174, 183, 184 and 210 to 214, the ES will need to demonstrate that: • **Rampion 2 makes effective use of land, including the use of suitable brownfield land, and provides an opportunity to remediate land affected by contamination.** • **Rampion 2 site is suitable for the proposed use taking account of ground conditions arising from contamination.** • **If remediation is required, then, as a minimum, after remediation, the land should not be capable of being determined as contaminated land under Part 2A of the Environmental Protection Act 1990.** • **Adequate site investigation information, prepared by a competent person, is provided.** • **Rampion Extension Development Limited (RED) have met the requirement to secure a safe development with respect to land contamination.** • **Rampion 2 is appropriate for its location, taking into account the likely effects (including cumulative effects) of pollution on health, living conditions and the natural environment, as well as the sensitivity of the site and wider area to impacts that could arise from Rampion 2.** • **With respect to land, Rampion 2 will need to demonstrate that the potential for migration of contaminants to affect sensitive receptors has been considered and there will be no significant effects.** • **With respect to mineral resources, Rampion 2 will need to demonstrate that minerals resources are not being needlessly sterilised.**	and guidance (including Part 2A of the Environmental Protection Act 1990 in the case of land contamination). The outputs of the assessment of likely significant effects are presented in **Sections 24.9** to **24.14**. The consideration of embedded environmental measures including how Rampion 2 has been designed to reduce land quality effects is addressed in **Table 24-14** in **Section 24.7** and includes measures to prevent land and soil pollution during the construction and operation and maintenance phases of Rampion 2.
National Policy Statement for Electricity Networks Infrastructure (EN-5) (DECC, 2011b)	

Policy description	Relevance to assessment
With regard to paragraphs 2.4.1, the ES will need to demonstrate that the impact of earth movement or subsidence caused by flooding or drought has been considered.	A review of potential geohazards (such as earth movement or subsidence) is included in the desk study (**Appendix 24.1: Phase 1 geo-environmental desk study, Volume 4** of the ES (Document Reference: 6.4.24.1)). The outputs of the assessment of likely significant effects are presented in **Sections 24.9 to 24.14**. The consideration of embedded environmental measures is addressed in **Table 24-14** in **Section 24.7** including how Rampion 2 has been designed to take into account effects of geohazards.

24.2.4 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.

24.2.5 The following emerging national planning policies are relevant to the assessment of the effects on ground conditions receptors:

- *Draft Overarching National Policy Statement for Energy (EN-1)*, (DESNZ, 2023a); and
- *Draft National Policy Statement for Electricity Networks Infrastructure (EN-5)*, (DESNZ, 2023b).

24.2.6 There are no emerging expectations or changes relevant to the assessment of the effects on ground conditions receptors from the current Overarching NPS EN1 for Energy (DECC, 2011a) and NPS EN5 for Electricity Networks Infrastructure (DECC, 2011b) listed in **Table 24-2**.

Local planning policy

24.2.7 The following local and regional planning authorities fall within the ground conditions Study Area and due regard has been given to their local and emerging planning policies, all of which refer to implementation of the requirements of the NPPF (MHCLG, 2019) in respect of the assessment of the effects on ground conditions receptors:

- West Sussex County Council (WSCC);
- Arun District Council;
- Horsham District Council; and
- Mid Sussex District Council.

Other relevant information and guidance

24.2.8 A summary of other relevant information and guidance relevant to the assessment undertaken for ground conditions is provided here:

- *The Environmental Protection Act 1990: Part 2A Contaminated Land Statutory Guidance* (Department for Environment, Food and Rural Affairs (DEFRA), 2012) sets out how local authorities should implement the Part 2A regime, including how they should go about deciding whether land is contaminated land in the legal sense of the term. It also elaborates on the remediation provisions of Part 2A, such as the goals of remediation, and how regulators should ensure that remediation requirements are reasonable.
- The Environment Agency (2020) guidance document *Land Contamination Risk Management* (LCRM) dated October 2020 provides the technical framework for applying a risk management process when dealing with land affected by contamination.
- The Contaminated Land: Applications in Real Environments (CL:AIRE) (2010) *Framework for Assessing the Sustainability of Soil and Groundwater Remediation* dated March 2010 provides a framework for assessing the sustainability of remediation and informing the decision-making process where remediation measures are required.
- The CL:AIRE (2016) *CAR-SOIL: Control of Asbestos Regulations 2012, Interpretation for Managing and Working with Asbestos in Soil and Construction and Demolition Materials* provides interpretation and guidance to all involved in the management of asbestos in both soils and construction and demolition arisings in accordance with the Control of Asbestos Regulations 2012.
- West Sussex County Council (2020a) *Minerals and Waste Safeguarding Guidance* dated March 2020 provides guidance on how the safeguarding of mineral resources and infrastructure associated with minerals supply and waste management will take place in West Sussex.

24.3 Consultation and engagement

Overview

24.3.1 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, 2020a) in relation to the ground conditions 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 Appendix, Volume 2** of the ES (Document Reference: 6.2.5).

24.3.2 Given the social distancing restrictions which have been in place due to the COVID-19 pandemic from 2020 to 2022, technical consultation relating to ground conditions has taken place online, primarily in the form of conference calls using Microsoft Teams.

Scoping Opinion

24.3.3 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, 2020a). The Scoping Report (RED, 2020) sets out the proposed ground conditions assessment methodologies, outline of the baseline data collected to-date and proposed, and the scope of the assessment. **Table 24-3** sets out the comments received in Section 5 of the Planning Inspectorate's Scoping Opinion (Planning Inspectorate, 2020a) 'Aspect based scoping tables – Onshore' and how these have been addressed in this ES. A full list of the Planning Inspectorate's Scoping Opinion (Planning Inspectorate, 2020a) 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 (RED, 2020).

Table 24-3 Planning Inspectorate Scoping Opinion (2020a) responses – ground conditions

Planning Inspectorate ID number	Scoping Opinion comment	How this is addressed in this ES
5.7.1	In relation to "*construction activities located on, or adjacent to landfills and other potentially contaminated sites such as industrial/waste management facilities and fuel storage/distribution facilities (exposure to contamination via direct contact, inhalation and/or ingestion of soils and dusts resulting in health effects"* being scoped out: "*The Inspectorate considers that given the nature of the development the conclusion is reasonable and therefore agrees that these matters can be scoped out of the assessment. This is based on the justification that any construction would be subject to The Construction (Design and Management) (CDM) Regulations 2015*	Acknowledged agreement to scope out effects from exposure to contamination via direct contact, inhalation and/or ingestion of soils and dusts resulting in health effects during temporary construction activities on or adjacent to landfills and other potentially contaminated sites. Additional detail on the legislation and embedded environmental measures, including how they will be employed and secured, has

Planning Inspectorate ID number	Scoping Opinion comment	How this is addressed in this ES
	and safe working practices as part of normal construction health and safety management under the Health and Safety at Work Act (1974) and regulations made under the Act. The Inspectorate agrees that, with the implementation of measures to limit any potential pollution incidents, any potential impacts on ground conditions are unlikely to result in significant effects and therefore further assessment is not required. However, the Inspectorate seeks assurances as to the detail of such measures that would be employed and how they would be secured and therefore considers that this detail should be described within the ES."	been included in **Table 24-14 in Section 24.4**.
5.7.2	In relation to *"construction vehicle and equipment maintenance and storage of fuels/oils for construction vehicles and equipment (accidental spillages and leaks resulting in ground contamination and risks to human health)"* being scoped out: "*The Inspectorate considers that given the nature of the development the conclusion is reasonable and therefore agrees that these matters can be scoped out of the assessment. This is based on the justification that any maintenance would be subject to The Construction (Design and Management) (CDM) Regulations 2015 and safe working practices as part of normal construction health and safety management under the Health and Safety at Work Act (1974) and regulations made under the Act.* *The Inspectorate agrees that, with the implementation of measures to limit any potential pollution incidents, any potential impacts on ground conditions are unlikely to result in significant effects and therefore further assessment is not required. However, the Inspectorate seeks assurances as to the detail of such measures that would be employed and*	Acknowledged agreement to scope out effects from accidental spillages and leaks resulting in ground contamination and risks to human health during construction activities. Additional detail on the legislation and embedded environmental measures, including how they will be employed and secured, has been included in **Table 24-14** in **Section 24.4**.

Planning Inspectorate ID number	Scoping Opinion comment	How this is addressed in this ES
	how they would be secured and therefore considers that this detail should be described within the ES."	
5.7.3	In relation to "*operational vehicle and equipment maintenance and storage of fuels/oils for operational vehicles and equipment (accidental spillages and leaks resulting in ground contamination and risks to human health"*) being scoped out: "*The Inspectorate considers that given the nature of the development the conclusion is reasonable and therefore agrees that these matters can be scoped out of the assessment."*	Acknowledged agreement to scope out effects from accidental spillages and leaks resulting in ground contamination and risks to human health during operation and maintenance activities.
5.7.4	In relation to "*decommissioning activities including removal and reinstatement of the onshore substation (exposure to contamination via direct contact, inhalation and/or ingestion of soils and dusts resulting in health effects)"* being scoped out: "*The Inspectorate considers that given the nature of the development (and likely activities during decommissioning) the conclusion is reasonable and therefore agrees that these matters can be scoped out of the assessment*."	Acknowledged agreement to scope out effects from exposure to contamination via direct contact, inhalation and/or ingestion of soils and dusts resulting in health effects during decommissioning activities.
5.7.5	In relation to *"decommissioning activities including removal and reinstatement of the onshore substation (accidental spillages and leaks resulting in ground contamination and risks to human health)"* being scoped out: "*The Inspectorate considers that given the nature of the development (and likely activities during decommissioning) the conclusion is reasonable and therefore agrees that these matters can be scoped out of the assessment*."	Acknowledged agreement to scope out effects from accidental spillages and leaks resulting in ground contamination and risks to human health during decommissioning activities.
5.7.6	*"The Inspectorate notes that the Study Area proposed is provisional and will be reviewed and amended in response to such matters as refinement of the onshore*	This ES uses the updated Study Area based on final onshore proposed DCO Order Limits and the criteria

Planning Inspectorate ID number	Scoping Opinion comment	How this is addressed in this ES
	components, the identification of additional impact pathways and in response, where appropriate, to feedback from consultation. The Inspectorate welcomes this approach to refinement of the Study Area and recommends that the ES should clearly define the chosen Study Area and provide a justification in support of its suitability."	presented in **Section 24.4**. The Study Area used for this ES is shown on **Figure 24.1, Volume 3** of the ES (Document Reference: 6.3.24) and is based on these principles and the latest onshore cable corridor and onshore substation areas.
5.7.7	*"Table 6.8.6 of the Scoping Report sets out the data sources to be used to inform the baseline assessment. Effort should be made to agree the desk-based Study Area and need for site surveys (as may be necessary according to the desk study outcomes) with relevant consultation bodies."*	Consultation has been undertaken with stakeholders as detailed in this Section of the chapter and included discussion of the Study Area and site inspection of key locations to support the desk study.
5.7.8	*"The Inspectorate notes the reference to the simple and detailed assessments which are 'analogous' to the stages of Land Contamination Risk Management (LCRM). The impact assessment should also include detailed and site-specific assessments to demonstrate that the risks to groundwater are acceptable, particularly in those areas identified as of greatest risk. Effort should be made to agree the approach to the assessment, including the simple and detailed assessment methodology and site-specific surveys, with the relevant consultation bodies, including the EA."*	The assessment presented in the desk study which supports this chapter (**Appendix 24.1: Phase 1 geo-environmental desk study, Volume 4** of the ES (Document Reference: 6.4.24.1)) identifies where more detailed site-specific assessments are required. Consultation was undertaken with stakeholders as detailed in this Section of the chapter and included discussion of assessment methodology.
5.7.9	*"The Inspectorate notes that the term Conceptual Site Model (CSM) is included within the acronyms listed in the Scoping Report. However, there is no reference to a CSM within the Ground Condition section of the Scoping Report. The Applicant should seek to agree the scope of and coverage of any CSM with the EA*	Reference to CSM has been included in this chapter. Consultation was undertaken with stakeholders as detailed this Section of the chapter

Planning Inspectorate ID number	Scoping Opinion comment	How this is addressed in this ES
	and other relevant consultation bodies, as appropriate."	and included discussion of the scope of the assessment, the baseline data and the CSM.
5.7.10	*"The ES should include specific consideration of any preferential pathways for pollution and contaminants that may be created as a result of the Proposed Development."*	Consideration of preferential pathway creation has been included as part the assessment of effects presented in **Section 24.8**.
- *Comment from WSCC to Planning Inspectorate, Ref. 6.8 General*	WSCC in its response to the scoping consultation undertaken by the Planning Inspectorate identified that the *"Scoping Boundary passes through a soft sand consultation area, a rare resource, the potential for sterilisation of which need to be firstly avoided where possible and secondly assessed within the EIA."* WSCC noted that *"Chalk Quarries, Aggregate Recycling Sites and allocated and permitted waste sites"* should be considered in the assessment. WSCC stated that the assessment should take into account its Minerals and Waste Safeguarding Guidance.	Minerals safeguarding has been included in the assessment of ground conditions in **Sections 24.9** to **24.14**. Consideration of effects on minerals safeguarding and on minerals sites is presented in **Sections 24.9** to **24.14** and takes into account the WSCC guidance (WSCC, 2020a).

Evidence Plan Process (EPP)

24.3.4 The Evidence Plan Process (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.

24.3.5 For ground conditions, further engagement has been primarily undertaken via the EPP Expert Topic Group (ETG) 'Onshore Ecology, Hydrology and Nature Conservation (onshore)' ETG Meetings alongside additional meetings with specific stakeholders, such as West Sussex County Council to discuss minerals safeguarding, as required.

24.3.6 Further information is provided in the **Evidence Plan** (Document Reference: 7.21). **Table 24-4** summarises the topics covered and the recorded outcomes of the ground conditions section of each ETG and specific stakeholder meeting.

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Table 24-4 Summary of ground conditions EPP meetings

Meeting Date	Meeting Attendees	Topics Covered	Outcomes
ETG Meetings			
28 October 2020	• West Sussex County Council; • Environment Agency; • Sussex Ornithological Society; • South Downs National Park Authority; • Sussex Wildlife Trust; • Royal Society for the Protection of Birds; • Natural England; and • Ouse and Adur Rivers Trust	• Scope of the ground conditions assessment; • Baseline data and supporting assessments to be used to undertake the assessment; • Proposed embedded environmental measures; • Assessment methodology; and • Proposed approach to address the Scoping Opinion comments detailed in **Table 24-3**.	No concerns were raised by the stakeholders in attendance at the ETG meeting to the scope and assessment of ground conditions effects.
23 March 2021	• West Sussex County Council; • Adur & Worthing District Council; • Mid-Sussex County Council; • Environment Agency; • Sussex Ornithological Society;	• Scope of the ground conditions assessment (noting that the scope had been increased to include minerals safeguarding); • The key potential sources of contamination identified from the baseline data;	No concerns were raised by the stakeholders in attendance at the ETG meeting to the scope and assessment of ground conditions effects.

Meeting Date	Meeting Attendees	Topics Covered	Outcomes
	• South Downs National Park Authority; • Sussex Wildlife Trust; • Royal Society for the Protection of Birds; and • Natural England;	• Details of the ground conditions inputs to refinement of the design of the onshore elements of the Proposed Development; and environmental measures; and • The preliminary findings of the Preliminary Environmental Information Report (PEIR) (RED, 2021) (excluding minerals safeguarding) to be published as part of the first Statutory Consultation exercise.	
03 November 2021	• West Sussex County Council; • Environment Agency; • East Sussex County Council; • Mid-Sussex County Council; • Sussex Ornithological Society; • South Downs National Park Authority; • Sussex Wildlife Trust; • Royal Society for the Protection of Birds; • Pevensey and Cuckmere Water Level Management Board;	• Findings of the PEIR (RED, 2021) and proposed approach to addressing the statutory consultation comments received; • Update on desk study which supports the land contamination assessment noting the site walkover survey had been completed in October 2021; and • Discussion on authorised landfill at Windmill Quarry, noting there would be no physical works within on adjacent to the boundary of the landfill.	No concerns were raised by the stakeholders in attendance at the ETG meeting to the assessment of ground conditions effects. The Environment Agency noted that given the distance of the onshore cable corridor from the landfill (over 50m), there would be no permitting issues.

Meeting Date	Meeting Attendees	Topics Covered	Outcomes
	• Natural England; and • Ouse and Adur Rivers Trust		
21 November 2022	• West Sussex County Council; and • Environment Agency.	• Update on desk study which support the land contamination assessment, in particular additional sources and receptors identified as part of proposed onshore cable corridor refinements being considered as part of the Proposed Development. • Discussion on preliminary findings of the PEIR Supplementary Information Report (SIR) (RED, 2022) which was published as part of the second Statutory Consultation exercise.	No concerns were raised by the stakeholders in attendance at the ETG meeting to the assessment of ground conditions effects. West Sussex County Council requested a separate discussion on minerals safeguarding with their internal planning team (see Other EPP Meetings below).
02 March 2023	• West Sussex County Council; • Environment Agency; • South Downs National Park Authority; and • Arun District Council.	• Discussion of feedback from second and third Statutory Consultation Exercises. • Discussion on preliminary findings of the PEIR Further Supplementary Information Report (FSIR) (RED, 2023) which was published as part of the third Statutory Consultation exercise. • Discussion on approach to the Environmental Statement.	No concerns were raised by the stakeholders in attendance at the ETG meeting to the assessment of ground conditions effects. West Sussex County Council requested a separate discussion on minerals safeguarding with their internal planning team (see Other EPP Meetings below).

Meeting Date	Meeting Attendees	Topics Covered	Outcomes
16 June 2023	• West Sussex County Council; • Environment Agency; • Horsham District Council; • Natural England; • South Downs National Park Authority; and • Arun District Council.	• Discussion of feedback from the third and fourth Statutory Consultation Exercises. • Discussion on approach to the Environmental Statement. • Discussion on the updated methodology for minerals safeguarding to be used in the Environmental Statement following EPP meeting with West Sussex County Council (see below).	No concerns were raised by the stakeholders in attendance at the ETG meeting to the assessment of ground conditions effects. Request from West Sussex County Council to include consideration of severance of mineral resources as part of the assessment where relevant.
Other EPP Meetings			
20 March 2023	• West Sussex County Council Minerals and Planning Team.	• Scope of the minerals safeguarding assessment. • Baseline data being used to undertake the minerals safeguarding assessment. • Minerals safeguarding assessment methodology. • Discussion on statutory consultation comments and preliminary findings of the PEIR, PEIR SIR and PEIR FSIR (RED, 2021; 2022; 2023).	General agreement reached with the findings of the preliminary assessments on the effects on minerals safeguarding however noting that the magnitude of effect criteria being used should be reviewed to ensure it is robust against the NPPF and local minerals planning policy requirements. Request that the Planning Statement submitted alongside the ES focused on the NPPF (MHCLG, 2019) tests for minerals safeguarding and included detail on local minerals planning policy where relevant.

Non-statutory consultation exercise – January / February 2021

24.3.7 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.

24.3.8 There were no key themes emerging from non-statutory consultation exercise in January 2021 specifically relating to ground conditions.

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

Statutory Consultation exercises

First Statutory Consultation exercise – July to September 2021

24.3.10 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 Rampion 2's first Statutory Consultation exercise which provided preliminary information on ground conditions within Chapter 25: Ground Conditions.

24.3.11 **Table 24-5** provides a summary of the key themes of the feedback received in the first Statutory Consultation exercise in 2021 in relation to ground conditions 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 is provided in the **Consultation Report** (Document Reference: 5.1).

Table 24-5 First Statutory Consultation exercise (July – September 2021) feedback

Stakeholder	Theme	How this is addressed in this ES
Arun District Council	Contamination discovered during construction activities for Rampion 2 should be appropriately quantified and managed.	The assessment presented in the desk study supporting this chapter (**Appendix 24.1: Phase 1 geo-environmental desk study, Volume 4** of the ES (Document Reference: 6.4.24.1)) identifies where there is the potential for contamination to be present. The embedded environmental measures set out in **Table 24-14** in **Section 24.7** include measures for dealing with contamination in line with the Environment Agency's

Stakeholder	Theme	How this is addressed in this ES
		guidance LCRM (2020) and dealing with the presence of unexpected contamination during the construction phase.
Environment Agency	In relation to excavation in Brook Barn Farm historical landfill, the Environment Agency agrees that as route only passes through a small section, the pollution risk is reduced and manageable. However, noted a detailed assessment of risk will still be required at detailed design stage.	Assessment of effects presented in **Sections 24.9** to **Section 24.14** with this conclusion. The embedded environmental measures set out in **Table 24-14** in **Section 24.7** include measures for dealing with contamination in line with the Environment Agency's guidance LCRM (2020). Detailed risk assessment will form part of a Contractors safe working practices developed by the Contractor prior to commencement of the construction phase.
West Sussex Council	Rock Common Quarry noted to be within the Soft Sand Resource and where impacts on Heavy Goods Vehicle (HGV) movements and minerals sterilisation should be considered.	Consideration of effects on minerals safeguarding and on minerals sites is presented in **Sections 24.9** to **24.14** and includes Rock Common Quarry as a specific site. Consideration of the impact of Rampion 2 on traffic is assessed in **Chapter 23: Transport, Volume 2** of the ES (Document Reference: 6.2.23) and **Chapter 32: ES Addendum, Volume 2** of the ES (Document Reference: 6.2.32) and [REP5-038].

24.3.12 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 ground conditions.

Second Statutory Consultation exercise – October to November 2022

24.3.13 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 DCO application.

24.3.14 **Table 24-6** provides a summary of the key themes of the feedback received in the second Statutory Consultation exercise in 2022 in relation to ground conditions 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 is provided in the **Consultation Report** (Document Reference: 5.1).

Table 24-6 Second Statutory Consultation exercise (October – November 2022) feedback

Stakeholder	Theme	How this is addressed in this ES
Natural England	Rampion 2 should aim to avoid interaction with landfill areas to minimise the impacts on the water environment.	Commitment to avoiding sensitive sites (including landfills and areas of potential contamination) where practical included in the embedded environmental measures set out in **Table 24-14** in **Section 24.7**. Through the design evolution process, the onshore elements of the Proposed Development only interact directly with potential sources of contamination at one location, a historical landfill at Brook Barn Farm. The assessment of effects presented in **Sections 24.9** to **Section 24.14** considers the impact of this interaction noting that the Environment Agency has indicated in their statutory consultation response (**Table 24-5**) that they consider the risks from this interaction to be low. The embedded environmental measures set out in **Table 24-14** in **Section 24.7** include measures for dealing with contamination in line with the Environment Agency's guidance LCRM. Detailed risk assessment will form part of a Contractors safe working practices developed by the Contractor prior to commencement of the construction phase.
Environment Agency	The Environment Agency welcomed confirmation that drilling fluids used during trenchless crossings, including Horizontal Directional Drilling	Commitment to the nature of drilling fluids included in the embedded environmental measures set out in **Table 24-14** in **Section 24.7**. The onshore elements of the Proposed Development only interact with landfill areas at one location, a historical landfill at Brook Barn Farm which given its age is not believed to have any containment features present. The assessment of

Stakeholder	Theme	How this is addressed in this ES
	(HDD), will not contain groundwater hazardous substances. Construction works should not compromise the containment features of landfills.	effects presented in **Sections 24.9** to **Section 24.14** considers the impact of this interaction noting that the Environment Agency have indicated in their statutory consultation response (**Table 24-5**) that they consider the risks from this interaction to be low. The embedded environmental measures set out in **Table 24-14** in **Section 24.7** include measures for dealing with contamination in line with the Environment Agency's guidance LCRM. Detailed risk assessment will form part of a Contractors safe working practices developed by the Contractor prior to commencement of the construction phase.
	Any works where furniture manufacture was a previous use, Per- and polyfluoroalkyl substances (PFAS) contamination may be present.	The onshore elements of the Proposed Development do not directly interact with any sites where furniture manufacturing was or is a use. The embedded environmental measures set out in **Table 24-14** in **Section 24.7** include measures for dealing with contamination including compliance with environmental and groundwater discharge permits where water containing contaminants may require disposal.

Third Statutory Consultation exercise – February to March 2023

24.3.15 The third Statutory Consultation exercise was undertaken from 24 February 2023 to 27 March 2023. This was a targeted consultation which focused on a further single onshore cable route alternative 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 DCO Application.

24.3.16 **Table 24-7** provides a summary of the key themes of the feedback received in the third Statutory Consultation exercise in 2023 in relation to ground conditions 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 2023 and the responses to those comments is provided in the **Consultation Report** (Document Reference: 5.1).

Table 24-7 Third Statutory Consultation exercise (February – March 2023) feedback

Stakeholder	Theme	How this is addressed in this ES
Environment Agency	Land contamination assessments should be undertaken as there may be potential sources of contamination, such as industrial sites, within the proposed areas being consulted.	The assessment presented in the desk study supporting this chapter (**Appendix 24.1: Phase 1 geo-environmental desk study, Volume 4** of the ES (Document Reference: 6.4.24.1)) identifies where there is the potential for contamination sources to be present. The assessment has been carried out in line with the Environment Agency's guidance for the assessment of land affected by contamination, LCRM, and covers the whole of the proposed DCO Order Limits including those areas consulted on as part of the third Statutory Consultation.

Fourth Statutory Consultation exercise – April to May 2023

24.3.17 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.

24.3.18 There were no key themes emerging from statutory consultation exercise in April 2023 specifically relating to ground conditions.

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

24.4 Scope of the assessment

Overview

24.4.1 This section sets out the scope of the ES assessment for ground conditions. This scope has been developed as Rampion 2 design has evolved and responds to feedback received to-date as set out in **Section 24.3**.

Spatial scope and Study Area

24.4.2 The spatial scope of the ground conditions assessment (excluding the minerals safeguarding assessment) is based on applying the following principles to give the wider of either:

- the onshore part of the proposed DCO Order Limits comprising the area within which the onshore elements of the Proposed Development and associated

onshore infrastructure will be located, including the temporary and permanent construction and operational work areas;

- a Zone of Influence (ZOI) 250m from the edge of the onshore cable corridor; or
- a ZOI 500m around the boundary of the land required for the onshore substation and substation extension works at the existing National Grid Bolney substation.

24.4.3 The minerals safeguarding assessment uses a ZOI 250m from the edge of the onshore part of the proposed DCO Order Limits.

24.4.4 The rationale for the ZOI used to define the Study Area is informed by considering:

- the spatial extent (taking into account contaminant degradation, dilution and dispersion in the environment) at which significant ground conditions effects have the potential to be realised through potentially active contaminant linkages;
- the spatial extent from which off-site sources of contamination have the potential to lead to significant effects on receptors within the onshore elements of the Proposed Development;
- the spatial extent from which geohazards such as compressible and collapsible ground have the potential to lead to significant effects on receptors within the onshore elements of the Proposed Development; and
- the spatial extent from which minerals sites / resources could be affected by the onshore elements of the Proposed Development or vice versa.

24.4.5 Using these principals, the ground conditions Study Area for this ES is shown on **Figure 24.1, Volume 3** of the ES (Document Reference: 6.3.24).

Temporal scope

24.4.6 The temporal scope of the assessment of ground conditions is the entire lifetime of Rampion 2 which, therefore, covers the construction, operation and maintenance, and decommissioning phases.

Potential receptors

24.4.7 The spatial and temporal scope of the assessment enables the identification of receptors which may experience a change as a result of Rampion 2. The receptors identified that may experience likely significant effects for ground conditions are outlined in **Table 24-8**.

Table 24-8 Receptors requiring assessment for ground conditions

Receptor group	Receptors included within group
Human Health	• construction / operational workers; • residential;

Receptor group	Receptors included within group
	• commercial / industrial; • public open space; and • land and property (including land used for allotments, agriculture (crops and livestock), existing and future structures, utilities and infrastructure).
Controlled Waters	• groundwater in superficial deposits; • groundwater in bedrock; • surface waters (for example, reservoirs, streams, rivers, lakes and ponds); and • groundwater and surface water abstractions.
Geodiversity	• geological Sites of Special Scientific Interest (SSSI); • Regionally Important Geological Sites (RIGS); and • Locally Important Geological Sites (LIGS).
Mineral Resources	• mineral sites with valid planning permissions for minerals extraction, and which have not been exhausted by previous extraction; • sites designated as preferred areas for mineral extraction in local planning authority (LPA) local plans; and • MSAs and minerals infrastructure consultation areas (MCAs) in LPA local plans.

Potential effects

24.4.8 Potential effects on ground conditions receptors that have been scoped in for assessment are summarised in **Table 24-9**.

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Table 24-9 Potential effects on ground conditions receptors scoped in for further assessment

Activity and impact	Potential effect	Receptor	Linkage Reference[1]
Construction			
Construction activities located on, or adjacent to landfills and other potentially contaminated sites such as industrial / waste management facilities and fuel storage / distribution facilities	Mobilisation of contamination via numerous pathways (including groundwater, surface water, preferential pathway creation and leaching from soil) resulting in contamination of controlled waters.	Controlled waters receptors (groundwater and surface waters).	GC-C-1
	Mobilisation of contamination via numerous pathways (including groundwater, surface water, leaching from soil, migration of vapours and windblown dusts) resulting in health effects.	Human health receptors (residential, agricultural land, commercial/industrial and public open space).	GC-C-2
	Build-up of gases in confined spaces in existing or newly constructed infrastructure on and adjacent to the land required for the Proposed Development.	Human health receptors (residential, commercial/industrial land) and property (including existing and new infrastructure).	GC-C-3
	Damage to newly constructed infrastructure from aggressive ground	Human health receptors, land and property (including existing and new infrastructure).	GC-C-4

[1] Linkage references have been included to allow for cross referencing of activity-effect-receptor within this ES chapter. GC = Ground Conditions, C = Construction, O = Operation and maintenance, D = Decommissioning.

Activity and impact	Potential effect	Receptor	Linkage Reference[1]
	conditions (such as sulphate attack on concrete) and geohazards including unstable ground conditions.		
Construction activities located near to sites of geological importance	Damage to or detrimental impact on sites of geological importance.	Sites of geological importance (SSSIs, RIGS or LIGS).	GC-C-5
Unexploded Ordnance (UXO) encounter during construction activities	Damage to existing property or infrastructure in vicinity of construction works or disruption to local communities.	Human health receptors and property (including existing and new infrastructure).	GC-C-6
Construction vehicle and equipment maintenance and storage of fuels / oils for construction vehicles and equipment	Accidental spillages and leaks resulting in ground contamination and risks to controlled waters during construction. This includes the potential for leakage of bentonite during trenchless crossing which includes Horizontal Directional Drilling (HDD).	Controlled waters receptors (groundwater and surface waters).	GC-C-7
Construction activities located within or near to minerals sites, preferred areas or safeguarding areas.	The viability of the operation of an ongoing mineral extraction site is reduced either through temporary / permanent sterilisation of a minerals resource or temporary reversal of previous sterilisation allowing access to unworked minerals for a limited period prior to the Proposed Development being constructed.	Mineral sites with valid planning permissions for minerals extraction, and which have not been exhausted by previous extraction. Sites designated as preferred areas for mineral extraction in LPA local plans. Minerals safeguarding areas and minerals consultation areas in LPA local plans.	GC-C-8

Activity and impact	Potential effect	Receptor	Linkage Reference[1]
Operation and maintenance			
Presence of significant quantities of artificial ground, disturbed landfill material or excavated and re-used material beneath permanent infrastructure	Mobilisation of landfill leachate, which, if not properly managed, could accumulate and/or migrate to controlled waters.	Controlled waters receptors (groundwater and surface waters).	GC-O-1
	Damage to infrastructure from aggressive ground conditions and geohazards including unstable ground conditions and settlement.	Land and property (including existing and new infrastructure).	GC-O-2
	Build-up of ground gases in confined spaces in existing or newly constructed infrastructure on and adjacent to the proposed DCO Order Limits.	Human health receptors (residential, commercial/industrial) and land and property (including existing and new infrastructure).	GC-O-3
Operational vehicle and equipment maintenance and storage of fuels / oils for operational vehicles and equipment	Accidental spillages and leaks resulting in ground and/or controlled waters contamination.	Controlled waters receptors (groundwater in superficial deposits and surface waters).	GC-O-4
Permanent infrastructure located within or near to minerals sites, preferred areas or safeguarding areas.	The viability of the operation of an ongoing mineral extraction site is reduced or results in permanent sterilisation of a minerals resource.	Mineral sites with valid planning permissions for minerals extraction, and which have not been exhausted by previous extraction. Sites designated as preferred areas for mineral extraction in LPA local plans.	GC-O-5

Activity and impact	Potential effect	Receptor	Linkage Reference[1]
		Minerals safeguarding areas and minerals consultation areas in LPA local plans.	
Decommissioning			
Decommissioning activities including removal and reinstatement of the onshore substation	Mobilisation of contamination via numerous pathways (including groundwater, surface water and leaching from soil) resulting in contamination of controlled waters.	Controlled waters receptors (groundwater and surface waters).	GC-D1
	Mobilisation of contamination via numerous pathways (including groundwater, surface water, leaching from soil, migration of vapours and windblown dusts) resulting in health effects.	Human health receptors (residential, agricultural land, commercial/industrial and public open space).	GC-D-2
	Accidental spillages and leaks resulting in ground contamination and risks to controlled waters during decommissioning.	Controlled waters receptors (groundwater and surface waters).	GC-D-3
Permanent infrastructure located within or near to minerals sites, preferred areas or safeguarding areas	The viability of the operation of an ongoing mineral extraction site is reduced or results in permanent sterilisation of a minerals resource.	Mineral sites with valid planning permissions for minerals extraction, and which have not been exhausted by previous extraction. Sites designated as preferred areas for mineral extraction in LPA local plans. Minerals safeguarding areas and minerals consultation areas in LPA local plans.	GC-D-4

Activities or impacts scoped out of assessment

24.4.9 A number of potential effects have been scoped out from further assessment, resulting from a conclusion of no likely 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.

24.4.10 Construction work for the construction or decommissioning of Rampion 2 must comply with the law. Construction workers will therefore be subject to the CDM Regulations 2015 and safe working practices as part of normal construction health and safety management under the Health and Safety at Work Act (1974) and regulations made under the Act. These legal obligations include the requirement for risk assessments and method statements for all construction related activities and the use of appropriate working methods, training and Personal Protective Equipment (PPE).

24.4.11 In addition to these legal obligations, **Section 24.7** outlines the embedded environmental measures that have been designed to reduce ground condition effects and include measures to prevent pollution incidents that could result in harm to construction workers. These measures include good and standard construction practices and actions that would be undertaken to meet existing legislative requirements under CDM Regulations (2015) and the Health and Safety at Work Act (1974).

24.4.12 Taking into account compliance with the law and the commitment to implementing the embedded environmental measures, there will be no significant adverse effects on construction workers as a result of Rampion 2 and, as agreed by the Planning Inspectorate (Planning Inspectorate (2020a) Scoping Response IDs 5.7.1 to 5.7.5 presented in **Table 24-3**), the effects in **Table 24-10** have been scoped out of this assessment.

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Table 24-10 Activities or impacts scoped out of assessment

Activity and impact	Effect	Receptor
Construction		
Construction activities located on, or adjacent to landfills and other potentially contaminated sites such as industrial / waste management facilities and fuel storage / distribution facilities	Exposure to contamination via direct contact, inhalation and/or ingestion of soils and dusts.	Human health receptors (construction workers).
Construction vehicle and equipment maintenance and storage of fuels / oils for construction vehicles and equipment	Accidental spillages and leaks resulting in ground contamination and risks to human health.	Human health receptors (construction workers).
Operation and maintenance		
Operational vehicle and equipment maintenance and storage of fuels / oils for operational vehicles and equipment	Accidental spillages and leaks resulting in ground contamination and risks to human health.	Human health receptors (construction/operational workers).
Decommissioning		
Decommissioning activities including removal and reinstatement of the onshore substation	Exposure to contamination via direct contact, inhalation and/or ingestion of soils and dusts.	Human health receptors (construction workers).
	Accidental spillages and leaks resulting in ground contamination and risks to human health.	Human health receptors (construction workers).

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24.5 Methodology for baseline data gathering

Overview

24.5.1 Baseline data collection has been undertaken to obtain information over the Study Areas described in **Section 24.4: Scope of the assessment**. The current baseline conditions presented in **Section 24.6: Baseline conditions** sets out data currently available information from the Study Area/s.

Desk study

24.5.2 The data sources that have been collected and used to inform this ground conditions assessment are summarised in **Table 24-11**.

Table 24-11 Data sources used to inform the ground conditions ES assessment

Source	Date	Summary	Coverage of Study Area
Groundsure	November 2020 and November 2022	Environmental and GIS data including information on geohazards, 1:10,000 and 1:50,000 historical mapping.	Full coverage of Study Area.
Gov.uk open data	November 2022	Rivers shapefile Source Protection Zones (SPZs) Historical and Authorised landfills shapefiles Environmental Pollution incidents (database) Consented discharge data.	Full coverage of Study Area.
MAGIC.gov.uk website	November 2022	Designated sites Aquifer designations and groundwater vulnerability Geological SSSIs information.	Full coverage of Study Area.
Ordnance Survey (OS)	November 2022	1:50,000 and 1:25,000 mapping.	Full coverage of Study Area.
British Geological Survey (BGS)	November 2022	On-line Geoindex 1:50,000 digital geology Borehole Record Viewer (offers access to the National Geoscience Data Centre collection of onshore scanned boreholes, shafts and well records). Minerals resource data.	Full coverage of Study Area.

Source	Date	Summary	Coverage of Study Area
Zetica Limited	July 2020 October 2021 and November 2022	UXO mapping. UXO desk study.	Full coverage of Study Area.
Sussex Geodiversity Partnership/ Sussex Biodiversity Record Centre	November 2022	Information on geological SSSIs, RIGS and LIGS.	Full coverage of Study Area.
Natural England	November 2022	Geological SSSI citations.	Full coverage of Study Area.
Local authorities	November 2022 and March 2023	Environmental site register data Contaminated land register data Landfills data Information on geological SSSIs, RIGS and LIGS Information on minerals planning applications / permissions, mineral resources and local plan designations / allocations.	Full coverage of Study Area.

Site surveys

Table 24-12 Site surveys undertaken

Survey type	Scope of survey	Coverage of Study Area
Site visits, October 2021 and October 2022	Site visit to verify information obtained as part of the ground conditions desk study (**Appendix 24.1: Phase 1 geo-environmental desk study, Volume 4** of the ES (Document Reference: 6.4.24.1)).	Site visit to onshore substation site and key locations along onshore cable corridor route identified in the PEIR (RED, 2021) and ES. Full details of the site visit are included in the desk study (**Appendix 24.1: Phase 1 geo-environmental desk study, Volume 4** of the ES (Document Reference: 6.4.24.1)).

Data limitations

24.5.3 There are no data limitations relating to ground conditions that affect the robustness of the assessment of this ES.

24.6 Baseline conditions

Overview

24.6.1 The information from the data sources outlined in **Section 24.5** has been used to develop a CSM from which the ground conditions assessment can be undertaken. The CSM identifies the sources, receptors, and potentially active pathways within the Study Area.

24.6.2 The detailed current baseline conditions and CSM are presented in the Phase 1 desk study report that accompanies this chapter as **Appendix 24.1: Phase 1 geo-environmental desk study, Volume 4** of the ES (Document Reference: 6.4.24.1) and a summary is outlined in the following section.

Current baseline

24.6.3 Superficial deposits are present in the Study Area, predominantly beneath the landfall location, around Arundel and along the course of the River Arun and River Adur. The deposits comprise alluvium, head deposits (brickearth, silt and blown sands) with clay with flints, and river terrace deposits in some locations. A plan showing the superficial deposits in the Study Area is presented on **Graphic 4-5** and **Graphic 4-6** of the desk study (**Appendix 24.1: Phase 1 geo-environmental desk study, Volume 4** of the ES (Document Reference: 6.4.24.1)).

24.6.4 Underlying the superficial deposits at the landfall location and around Arundel the solid geology comprises predominantly Chalk overlain by a narrow band of Lambeth Group and Thames Group (London Clay Formation) just to the south of Arundel.

24.6.5 As the onshore cable corridor runs northeastwards, the solid geology comprises a narrow band of the Gault Formation and the Upper and Lower Greensand Formations, with much of the solid geology comprising Weald Clay as shown on **Graphic 4-7** and **Graphic 4-8** of the desk study (**Appendix 24.1: Phase 1 geo-environmental desk study, Volume 4** of the ES (Document Reference: 6.4.24.1)).

24.6.6 Groundwater is likely to be present in the permeable strata of the superficial deposits, Lambeth Group and Greensand Formations, which the Environment Agency classifies as Secondary (A) Aquifers. The main hydrogeological unit is the Chalk, which the Environment Agency classifies as a Principal Aquifer. The Weald Clay is classified as Unproductive Strata. Environment Agency data also indicates that there are a number of existing groundwater abstractions and source protection zones (SPZs) to the northeast of Arundel. A more detailed description of the groundwater and surface water baseline is included in **Chapter 26: Water environment, Volume 2** of the ES (Document Reference: 6.2.26).

24.6.7 Numerous ponds and streams are indicated by OS mapping to be present within the Study Area, which crosses two rivers (the River Arun and the River Adur). In addition, there are anticipated to be numerous drainage ditches present on the agricultural land along the onshore cable corridor.

24.6.8 The general land use within the Study Area is agricultural (arable and improved grassland), with a number of towns, villages and commercial areas connected by roads. The existing National Grid Bolney substation (including the immediately adjacent Rampion 1 onshore substation) and a sewage treatment works to the south of the village of Partridge Green are also present in the Study Area.

24.6.9 Environment Agency information indicates that there are a number of historical landfills within the Study Area, predominantly to the northwest of Littlehampton and to the north of Angmering. An authorised landfill (Windmill Quarry, operated by Biffa Waste Services Ltd) is also shown to be present to the northeast of the village of Washington, West Sussex as shown on **Figure 24.2a-v, Volume 3** (Document Reference: 6.3.24) of this chapter and **Figure 24.1.2a-v** of the desk study (**Appendix 24.1: Phase 1 geo-environmental desk study, Volume 4** of the ES (Document Reference: 6.4.24.1)).

24.6.10 There are no geological SSSIs located within the Study Area. Two LIGS (Rock Common Sand Quarry and Warningcamp Quarry) are present within the Study Area as shown on **Figure 24.2a-v, Volume 3** (Document Reference: 6.3.24) of this chapter and **Figure 24.1.2a-v** of the desk study (**Appendix 24.1: Phase 1 geo-environmental desk study, Volume 4** (Document Reference: 6.4.24.1)).

24.6.11 The majority of the Study Area is classified as having a low UXO hazard with an area of moderate to high UXO hazard identified where the onshore cable corridor passes through the former World War II South Downs Training Area between Warningcamp and Washington as detailed in Appendix B of the desk study (**Appendix 24.1: Phase 1 geo-environmental desk study, Volume 4** of the ES (Document Reference: 6.4.24.1)).

24.6.12 Based on the desk study (**Appendix 24.1: Phase 1 geo-environmental desk study, Volume 4** of the ES (Document Reference: 6.4.24.1)), potential sources of contamination that may be present in, or within the vicinity of the onshore cable corridor and onshore substation that required further consideration were anticipated to include:

- the historical landfills at Brook Barn Farm (Littlehampton), Old Mead Road Tip (Littlehampton), Long Furlong (Findon) and Swillage Lane (Angmering);
- the authorised landfill at Windmill Quarry;
- areas of known made ground or infilled land, former ponds, quarries and railway lines;
- commercial/industrial properties at The Vinery Industrial Estate (near Polling) and Oakendene Industrial estate (near Bolney);
- historical petroleum tanks associated with a vehicle showroom and former service station near Washington, West Sussex;
- a sewage treatment works at Partridge Green; and

- the existing National Grid Bolney substation.

24.6.13 Based on the review of minerals planning information the following potential minerals resources have been identified within the Study Area:

- planning application and minerals infrastructure consultation area associated with Rock Common Sand Quarry;
- planning application at Washington Sand Pit;
- MSA for soft sand (including potential silica sand);
- MSA for brick clay;
- MSA for building stone;
- MSA for chalk;
- minerals infrastructure consultation areas at Storrington and associated with Washington Chalk Quarry; and
- proposed strategic mineral site allocations at Ham Farm, Steyning and Chantry Lane Extension, Storrington.

24.6.14 A figure summarising the ground conditions baseline is presented as **Figure 24.2a-v, Volume 3** of the ES (Document Reference: 6.3.24). The baseline with respect to minerals is summarised on **Figure 24.3, Volume 3** of the ES (Document Reference: 6.3.24).

Future baseline

24.6.15 With the exception of minerals safeguarding, in the absence of Rampion 2, there is unlikely to be a change in the baseline conditions over the lifetime of the Proposed Development. This is because the geology and ground conditions are unlikely to be altered over time without a significant change of land use.

24.6.16 With respect to management of land contamination, the relevant requirements are identified under Part 2A of the Environmental Protection Act and, for other future developments, the Town and Country Planning Act 1990**.** Part 2A of the Environmental Protection Act requires local authorities to identify potentially contaminated land in their area and ensure potential risks from historical contamination are assessed and mitigated accordingly.

24.6.17 For future developments which take place within the Study Area, the Town and Country Planning Act 1990 requires the consideration of the potential for contamination to be present. Where necessary a developer would be required to carry out remediation of contamination to ensure the development site is suitable for the proposed end use.

24.6.18 Therefore, it is reasonable to conclude that in the absence of Rampion 2 there would not be a detrimental change in ground conditions over time within the Study Area.

24.6.19 Planning applications to extend the periods of working at Rock Common Quarry and Washington Sand Pit are currently under determination by West Sussex County Council. Whether minerals extraction would be permitted during the

lifetime of the Proposed Development will depend on the outcome of these applications.

24.6.20 Whilst both of these applications have yet to be determined, West Sussex County Council have indicated that the timescales requested in each application (for example extension by two years at Rock Common Quarry) would apply from the point of determination. Therefore, consideration has been given to the timing of extraction and subsequent restoration when assessing the effect of Rampion 2 on minerals safeguarding using a worst-case approach that these sites are still operational during the construction phase of the Proposed Development.

24.7 Basis for ES assessment

Maximum design scenario

24.7.1 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 design 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.

24.7.2 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].

24.7.3 The maximum parameters and assessment assumptions that have been identified to be relevant to ground conditions are outlined in **Table 24-13** 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 24-13 Maximum parameters and assessment assumptions for impacts on ground conditions

Project phase and activity / impact	Maximum assessment assumptions	Justification
Construction	Onshore cable corridor: • Up to 40m wide onshore cable corridor located within the onshore part of the ES Assessment Boundary with approximate length of ~~40km~~38.8km. • Up to 4 trenches, with burial depth target of 1.2~~0~~m to top of duct. • Up to 66 joint bays each with up to 4 joint boxes and with an approximate depth of ~~1.5m~~up to 2m. Temporary construction compounds: • Up to four temporary construction compound locations (each up to approximately 6 hectares (ha) in size. • Temporary construction compound use duration of up to three years six months. New onshore substation at Oakendene: • Up to ~~12ha~~ 6ha permanent area for onshore substation with associated structures and infrastructure plus~~and~~ drainage / landscaping areas. • Up to 2.5ha additional temporary works area.	The onshore temporary construction corridor and potential temporary construction compounds represent the areas where construction works may result in ground condition effects, for example from spills or leaks from construction equipment or minerals sterilisation and provides for worst-case assessment to allow for micro siting of onshore cable corridor within the onshore part of the proposed DCO Order Limits. The design assumptions for temporary construction activities such as volumes of potentially contaminating substances and frequency of refuelling activities are reasonable maximum assumptions from which to assess the risk of soil or groundwater contamination. The design assumptions for the Existing National Grid Bolney substation extension are based on an Air Insulated Substation (AIS) which represents the largest area on which permanent development will be undertaken and therefore the largest area in which construction works may result in ground condition effects.

Project phase and activity / impact	Maximum assessment assumptions	Justification
	Existing National Grid Bolney substation extension works: • Up to 0.63ha extension with associated structures and infrastructure and drainage / landscaping areas. • Up to 0.723ha additional temporary works area.	
Operation and maintenance	Onshore cable corridor: • All permanent onshore cable elements will be below ground. • Cables are not oil-filled. • Minimal maintenance required (periodic testing at joint boxes every 2 to 5 years). New onshore substation at Oakendene: • Up to 612ha permanent area for onshore substation with associated structures and infrastructure plusand drainage/landscaping areas. • Around 30 year operational lifetime. Existing National Grid Bolney substation extension works: • Up to 0.723ha extension with associated structures and infrastructure and drainage/landscaping areas. • Around 30 year operational lifetime.	This area represents the permanent infrastructure that could result in ground condition effects during the operation and maintenance phase, for example, from potential contamination due to spills or leaks from operational equipment or from minerals sterilisation. The design assumptions for the Existing National Grid Bolney substation extension are based on an Air Insulated Substation (AIS) which represents the largest area on which permanent development will be undertaken.

Project phase and activity / impact	Maximum assessment assumptions	Justification
Decommissioning	Onshore substation at Oakendene and substation extension at the existing National Grid Bolney substation: • If fully decommissioned and returned to baseline condition, assessment assumptions as per construction phase. Onshore cable corridor: • Left *in-situ* with ends cuts, sealed and buried.	Onsite disassembly of equipment and demolition of structures would have greatest potential for soil or groundwater contamination due to spills, leaks and waste generated. A decommissioning plan will be provided, as secured through the measures in **Table 24-14**. The detail and scope of the decommissioning will be determined by the relevant legislation and guidance at the time along with the proposed end-use for the land. As such, 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 cut, sealed and buried to minimise effects associated with removal. The removal of infrastructure or easements associated with the cables which will remain *in-situ* could lead to the opening up of minerals which have been sterilised by that infrastructure.

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Embedded environmental measures

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

24.7.5 These 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.

24.7.6 **Table 24-14** sets out the relevant embedded environmental measures within the design and how these affect the ground conditions assessment.

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Table 24-14 Relevant ground conditions embedded environmental measures

ID	Environmental measure proposed	Project phase measure introduced	How the environmental measures will be secured	Relevance to ground conditions assessment
C-5	Trenchless crossings will be provided for features where identified in Appendix A -Crossing Schedule of the Outline Code of Construction Practice.~~Main rivers, watercourses, railways and roads that form part of the Strategic Highways Network will be crossed by Horizontal Directional Drill (HDD) or other trenchless technology where this represents the best environment solution and is financially and technically feasible (see C-17).~~	Scoping - updated at PEIR	**Draft Development Consent Order (DCO)**, Schedule 1, Part 3, Requirement 6 (4), Cable Parameters Draft DCO, Schedule 1, Part 3, Requirement 22, Code of Construction Practice (CoCP)~~CoCP~~ (4) (p)~~DCO works plans and order limits~~	Minimises potential for pollution of controlled waters receptors during construction.
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 authorised landfills and other known areas of potential contamination, National Trust Land, Listed Buildings, Scheduled monuments,	Scoping - updated at PEIR	**Draft DCO**, Schedule 1, Part 1 The Authorised Development~~**DCO** works plans and order limits~~	Minimises potential to damage geologically important sites and minimises interaction with land potentially

ID	Environmental measure proposed	Project phase measure introduced	How the environmental measures will be secured	Relevance to ground conditions assessment
	and mineral resources (including existing mineral sites, minerals sites allocated in development plans and mineral safeguarding areas).			affected by contamination.
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 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.~~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,~~	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)~~**Outline CoCP** (Document Reference: 7.2) and DCO requirement~~	Minimises potential for pollution from leaks and spills during construction.

ID	Environmental measure proposed	Project phase measure introduced	How the environmental measures will be secured	Relevance to ground conditions assessment
	~~have appropriate containment and segregation and will be risk 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-14	Potential risks to human health from any unexpected ground contamination will be avoided by the use of Personal Protective Equipment (PPE) and by adopting appropriate working practices.	Scoping	**Draft DCO**, Schedule 1, Part 3, Requirement 22 CoCP (4) (j)~~**Outline CoCP** (Document Reference: 7.2) and DCO requirement~~	Minimises risks to construction workers during construction.
C-17	~~Where trenchless techniques are not required or are not practical, watercourses may be crossed by open cut techniques (with flows overpumped around the working area). Appropriate environmental permits or land drainage consents will be applied for works from the Environment Agency (e.g. for Main Rivers, works on or near sea defences/flood defence structures or in a flood plain) or from the Lead Local Flood Authority (LLFA) (for Ordinary Watercourse crossings) (see C-5).~~Trenchless crossing	Scoping - updated at PEIR	The Environmental Permitting (England and Wales) Regulations 2016 **Draft DCO** Schedule 1, Part 3,	Minimises potential for pollution of controlled waters receptors during construction.

ID	Environmental measure proposed	Project phase measure introduced	How the environmental measures will be secured	Relevance to ground conditions assessment
	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).		Requirement 22 CoCP (~~5~~4) (p~~g~~) Land Drainage Act 1991~~**Outline CoCP** (Document Reference: 7.2) and DCO requirement~~	
C-24	Best practice air quality management measures will be applied as described in Institute of Air Quality Management (IAQM) (~~2016~~2024) guidance on the Assessment of Dust from Demolition and Construction ~~2016~~2024, version ~~1.1~~2.2.	Scoping - updated at PEIR	**Draft DCO**, Schedule 1, Part 3, Requirement 22 CoCP (~~5~~4) (h~~i~~)~~**Outline CoCP** (Document Reference: 7.2) and DCO requirement~~	Minimises risks to human health receptors during construction.
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	Minimises risks to human health receptors during construction.

ID	Environmental measure proposed	Project phase measure introduced	How the environmental measures will be secured	Relevance to ground conditions assessment
			Draft DCO, Schedule 1, Part 3, Requirement 22 CoCP~~**Outline CoCP** (Document Reference: 7.2) and DCO requirement~~	
C-31	Any disposal off-site of excavated material will be undertaken in consultation with the landowner/occupier and in accordance with the Waste Management Regulations.	Scoping	**Draft DCO**, Schedule 1, Part 3, Requirement 22 CoCP (5) (d)~~**Outline CoCP** (Document Reference: 7.2) and DCO requirement~~	Minimises risks of inappropriate reuse of materials during construction.
C-69	Construction strategies will be implemented that will seek to maximise: • the reuse of excavated clean materials from the onshore cable construction corridor where practicable and feasible. Prior to a stage of construction, a Materials Management Plan (MMP) will be developed that outlines where excavated non-waste materials will be reused in line with the CL:AIRE (2011) Definition of Waste Code of Practice (DoWCoP). A declaration	Scoping - updated at PEIR	**Draft DCO**, Schedule 1, Part 3, Requirement 22 CoCP (4) (c), (d)~~**Outline CoCP** (Document Reference: 7.2)~~	Minimises risks of inappropriate reuse of materials during construction.

ID	Environmental measure proposed	Project phase measure introduced	How the environmental measures will be secured	Relevance to ground conditions assessment
	will be made to CL:AIRE by a Qualified Person that the MMP has been completed in accordance with the DoWCoP and that best practice is being followed; and. • the reuse of excavated minerals from the onshore cable construction corridor as a resource, where they remain available following reinstatement works and where their use is practicable and feasible. Prior to the stage of construction, a MMP will developed which includes a specific minerals section which outlines how minerals will be identified, extracted, stored and reinstated, and re-used.~~Construction strategies will be implemented that will seek to maximise the reuse of excavated clean materials from the onshore cable construction corridor where practicable and feasible. Prior to construction, an Outline Materials Management Plan (MMP) will be developed that outlines where excavated non-waste materials will be reused in line with the CL:AIRE (2011) Definition of Waste Code of Practice (DoWCoP). The MMP will include a declaration by a Qualified Person that the MMP has been completed in accordance with the DoWCoP and that best practise is being followed.~~		~~and DCO requirement~~	
C-70	An Emergency Response Plan in accordance with 'Unexploded ordnance, A guide for the construction industry CIRIA C681' (CIRIA, 2009) will be developed prior to construction. Site inductions, toolbox talks and appropriate training on the risks from UXO will also be undertaken as part of the construction approach for Rampion 2. In areas with a moderate UXO hazard	Scoping - updated at PEIR	**Draft DCO**, Schedule 1, Part 3, Requirement 22 CoCP (4) (i)~~**Outline CoCP** (Document~~	Minimises risks from UXO encounter during construction.

ID	Environmental measure proposed	Project phase measure introduced	How the environmental measures will be secured	Relevance to ground conditions assessment
	level and above, a detailed UXO desk study will be undertaken prior to construction to identify where additional mitigation such as non-intrusive geophysical clearance or supervision by an explosive ordnance clearance (EOC) operative is required.		~~Reference: 7.2) and DCO requirement~~	
C-71	RED will ensure that the land used for the Proposed Development is suitable for the proposed use with respect to the potential for soil and groundwater contamination and, where necessary, risk-based remediation is undertaken in line with Environment Agency (2020) guidance (Land Contamination: Risk Management). The precise design of any remediation strategy will be confirmed in the detailed design after consent has been granted and will be informed by targeted ground investigation in line with the findings of the Phase 1 Desk Study.	Scoping - updated at PEIR and ES	**Draft DCO**, Schedule 1, Part 3, Requirement 25 Contamination risk (1), (2) (a)~~DCO and UK legislation requirement~~	Minimises risks to human health and controlled waters during construction. Embeds best practice land contamination guidance into construction of the onshore elements of the Proposed Development.
C-72	Prior to construction, an unexpected contamination protocol will be developed in line with Environment Agency (2020) guidance (LCRM) to minimise the potential risks to human health and controlled waters from any unexpected ground contamination. The protocol will take into account the requirements for risk assessment, the use of Personal Protective Equipment (PPE) and adoption of best practice methods during construction.	Scoping - updated at PEIR	**Draft DCO**, Schedule 1, Part 3, Requirement 25 Contamination risk (3)~~**Outline CoCP** (Document Reference: 7.2) and DCO requirement~~	Minimises risks to human health and controlled waters during construction. Embeds best practice land contamination guidance into construction of the onshore elements of the Proposed Development.
C-76	In line with good practice, Pollution Prevention Plans (PPPs) will be developed to detail how ground and surface waters will be	Scoping - updated at	**Draft DCO**, Schedule 1, Part 3,	Minimises potential for pollution of controlled

ID	Environmental measure proposed	Project phase measure introduced	How the environmental measures will be secured	Relevance to ground conditions assessment
	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.	PEIR and ES	Requirement 22 CoCP (4~~5~~) (i~~k~~) Draft Development Consent Order, Schedule 1, Part 3, Requirement 27 and 28 Operations phase maintenance (2) (a)~~**Outline CoCP (Document Reference: 7.2) and DCO requirement**~~	waters receptors during construction.
C-116	The basis of the structural design for the proposed onshore cable corridor and onshore substation and National Grid Bolney substation extension infrastructure will be completed in general accordance with design standards to minimise the risk of structural or geotechnical instability. The structural design of onshore substation buildings will give due consideration to minimum design requirements for ambient design temperatures, wind pressures and snow loads, including climate change allowances where appropriate.	PEIR – updated at 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	Minimises risks from geohazards (such as earth movement or subsidence) during construction and, operation and maintenance.

ID	Environmental measure proposed	Project phase measure introduced	How the environmental measures will be secured	Relevance to ground conditions assessment
			(2)~~Embedded into design of Proposed Development and **Outline CoCP** (Document Reference: 7.2)~~	
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 (e.g. aluminium trackway) and other site specific measures (e.g. 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)~~**Outline CoCP** (Document Reference: 7.2) and DCO requirement~~	Minimises potential for pollution of controlled waters receptors during construction.
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)	Minimises potential for pollution of controlled waters receptors during construction.

ID	Environmental measure proposed	Project phase measure introduced	How the environmental measures will be secured	Relevance to ground conditions assessment
			The Environmental Permitting (England and Wales) Regulations 2016~~Outline CoCP and DCO requirement~~	
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)~~Outline CoCP and DCO requirement~~	Minimises potential for pollution of controlled waters receptors during construction. Minimises risks of inappropriate reuse of materials during construction.
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) ~~Outline CoCP and DCO requirement~~	Minimises potential for pollution of controlled waters receptors during construction.

ID	Environmental measure proposed	Project phase measure introduced	How the environmental measures will be secured	Relevance to ground conditions assessment
C-150	Plant and machinery used during the construction and operation and maintenance 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) (i)~~**Outline CoCP and DCO requirement**~~	Minimises potential for pollution from leaks and spills during construction.
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) (i)~~**Outline CoCP (Document Reference: 7.2) and DCO requirement**~~	Minimises potential for pollution from leaks and spills during construction.
C-152	In the event that piling is selected for installation of the onshore substation foundations, a detailed piling risk assessment will be	PEIR	**Draft DCO**, Schedule 1, Part 3,	Minimises potential for creating preferential

ID	Environmental measure proposed	Project phase measure introduced	How the environmental measures will be secured	Relevance to ground conditions assessment
	developed. This will be submitted to the Environment Agency for approval at the detailed design stage, prior to the commencement of construction.		Requirement 22 CoCP (4) (k)~~**Outline CoCP** (Document Reference: 7.2) and DCO requirement~~	pathways for contamination during construction.
C-153	An Operations and Maintenance Plan will be developed with a Pollution Incident Control Plan (PICP) for implementation during the operational and maintenance phase.	PEIR	**Draft DCO**, Schedule 1, Part 3, Requirement 27 and 28 Operations phase maintenance (2) (b)~~**Outline CoCP** (Document Reference: 7.2) and DCO requirement~~	Minimises potential for pollution from leaks and spills during operational phase.
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	Minimises potential for pollution from leaks and spills during construction.

ID	Environmental measure proposed	Project phase measure introduced	How the environmental measures will be secured	Relevance to ground conditions 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.		approval onshore substation (2), Requirement 9 Detailed design approval – extension to National Grid substation (2)~~**Outline CoCP** (Document Reference: 7.2) and DCO requirement~~	
C-234	Techniques will be employed by the contractor to manage the risk of drilling fluid breakout or losses into the 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	ES	**Draft DCO**, Schedule 1, Part 3, Requirement 22 CoCP (4) (j), Requirement 23 Onshore construction method statement (2) (a)~~**Outline CoCP** (Document Reference: 7.2) and DCO requirement~~	Minimises potential for pollution of controlled waters during construction.

ID	Environmental measure proposed	Project phase measure introduced	How the environmental measures will be secured	Relevance to ground conditions assessment
	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.			
~~C-239~~	~~It is anticipated that similar environmental measures to those embedded into the Project design for the construction phase (for example health and safety procedures and emergency planning relating to extreme weather) would be implemented at the decommissioning phase. The decommissioning phase would be subject to a written phase of decommissioning for approval by the local planning authority (DCO Requirement 16).~~	~~ES~~	~~DCO requirement~~	~~Minimises land contamination risks during decommissioning.~~
C-240	It is anticipated that similar environmental measures to those embedded into the Project design for the construction phase would be implemented at the decommissioning phase. This would include planning for extreme weather and material selection in accordance with climate conditions at that time. The decommissioning phase would be subject to a written phase of decommissioning for approval by the local planning authority.	ES	**Draft DCO**, Schedule 1, Part 3, Requirement 34 Onshore decommissioning (2)	Minimises land contamination risks during decommissioning.
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 to the ground. If fluid loss is identified there are a number of measures that can be taken to seal the bore, including the following:	ES	**Draft DCO**, Schedule 1, Part 3, Requirement 22 CoCP (4) (j) Draft DCO, Schedule 1, Part 3,	Minimises potential for pollution of controlled waters during construction.

ID	Environmental measure proposed	Project phase measure introduced	How the environmental measures will be secured	Relevance to ground conditions assessment
	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 the ground conditions.		Requirement 23 Onshore construction method statement (2) (a)~~**Outline CoCP** (Document Reference: 7.2) and DCO requirement~~	
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)~~**Outline CoCP** (Document Reference: 7.2) and DCO requirement~~	Minimises potential for pollution of controlled waters during construction.

24.7.7 Further detail on the environmental measures in **Table 24-14** is provided in the **Commitments Register** (Document Reference: 7.22) which sets out how and where particular environmental measures will be implemented and secured.

24.8 Methodology for ES assessment

Introduction

24.8.1 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). Excluding UXO and minerals safeguarding, the assessment methodology for ground conditions for the ES is consistent with that provided in the Scoping Report (RED, 2020) and no changes have been made since the scoping phase and PEIR and PEIR SIR (RED, 2021; 2022) provided alongside Statutory Consultation exercises in 2021 and 2022.

24.8.2 For UXO, the assessment methodology has been updated from that set out in the scoping phase, PEIR and PEIR SIR (RED, 2021; 2022) to align to the approach used for risk assessment in the detailed UXO desk study (included in **Annex C, Appendix 24.1: Phase 1 geo-environmental desk study, Volume 4** of the ES (Document Reference: 6.4.24.1)) rather than the comparison of baseline and post-development risks which was previously adopted in the scoping phase, PEIR and PEIR SIR (RED, 2021; 2022), also recognising that assessing the impacts from UXO is more akin to construction-related health and safety risk than an environmental impact assessment.

24.8.3 For minerals safeguarding, the need for this assessment was identified through the Scoping Report consultation response from WSCC. The assessment methodology for the ES is consistent with that set out in the PEIR provided alongside first Statutory Consultation exercise in 2021.

24.8.4 The assessment and management of ground conditions (not including UXO and the minerals assessment) is usually based on the risk presented by the presence of a hazard (for example, contamination) for a given circumstance (i.e. the probability and consequence of an event occurring). However, EIA seeks to identify the magnitude of a change in status from baseline (impact) caused by the Proposed Development and the consequences of those changes (effects).

24.8.5 Consequently, for the ground conditions assessment (excluding UXO and minerals safeguarding), the impact and its effect have been defined as a change in risk and the magnitude of the change in risk from baseline, through construction to post-development conditions.

24.8.6 The methodology that is proposed for assessing these risks is set out in **Paragraph 24.8.11** onwards and is supported by a desk study (**Appendix 24.1: Phase 1 geo-environmental desk study, Volume 4** of the ES (Document Reference: 6.4.24.1)) which sets out the baseline and post-development risks identified for Rampion 2 using this methodology.

24.8.7 For UXO, the methodology is based on professional judgement to consider the significance, in EIA terms, of the level of risk identified in the UXO desk study (included in **Appendix 24.1: Phase 1 geo-environmental desk study, Volume 4**

of the ES (Document Reference: 6.4.24.1)) and the mitigation proposed to be undertaken prior-to and during construction of Rampion 2.

24.8.8 The methodology for the UXO assessment is set out **paragraph 24.8.22** onwards.

24.8.9 For the minerals assessment, the methodology is based on the proximity of the onshore elements of the Proposed Development to identified minerals resources, and the impact that the onshore elements of the Proposed Development would have on the ability to extract economically viable resources. The effect is determined by considering the sensitivity of the minerals resources, based on the likelihood of extraction occurring, and the magnitude of change from the level of impact that the onshore elements of the Proposed Development will have.

24.8.10 The methodology for the minerals safeguarding assessment is set out **paragraph 24.8.25** onwards.

Risk Assessment – Land Contamination

24.8.11 The process of managing land contamination, as set out in the Environment Agency (2020) guidance LCRM, is based on risk assessment. The assessment of risks from contaminated land is based upon the identification and subsequent assessment of a contaminant linkage. A contaminant linkage requires the presence of:

- a source of contamination;
- a receptor capable of being adversely affected by the contamination; and
- an active pathway capable of exposing a receptor to the contaminant.

24.8.12 The risk assessment aims to assess the significance of each potential contaminant linkage. The key to the classification is that the designation of risk is based upon the consideration of both of the following:

- the magnitude of the potential consequence (severity). It takes into account both the potential severity of the hazard and the sensitivity of the receptor; and
- the magnitude of probability (likelihood). It takes into account both the presence of the hazard and receptor and the potential for a pathway to be realised between them.

24.8.13 The definitions for the qualitative risk assessment have been taken from *Guidance for the Safe Development of Housing on Land Affected by Contamination Annex 4* (National House Building Council (NHBC) et al., 2008).

24.8.14 The likelihood classifications for the contaminant linkages being realised is presented in **Table 24-15**.

Table 24-15 Likelihood classification of contaminant linkage being realised

Classification	Definition	Examples
High Likelihood	There is a contaminant linkage and an event would appear	a) Elevated concentrations of toxic contaminants are present in soils in

Classification	Definition	Examples
	very likely in the short-term and almost inevitable over the long-term, or there is evidence at the receptor of harm or pollution.	the top 0.5m of ground where direct contact is possible. b) Ground/groundwater contamination could be present from chemical works, containing a number of Underground Storage Tanks (USTs).
Likely	There is a contaminant linkage and all the elements are present and in the right place, which means that it is probable that an event will occur. Circumstances are such that an event is not inevitable, but possible in the short-term and likely over the long-term.	a) Elevated concentrations of toxic contaminants are present in soils at depths of 0.5-1.0m where direct contact is possible, or the top 0.5m of ground where direct contact is not possible. b) Ground/groundwater contamination could be present from an industrial site containing an Underground Storage Tank (UST) present between 1970 and 1990. The tank is known to be single skin. There is no evidence of leakage although there are no records of integrity tests.
Low Likelihood	There is a contaminant linkage and circumstances are possible under which an event could occur. However, it is by no means certain that even over a long period such an event would take place and is less likely in the shorter term.	a) Elevated concentrations of toxic contaminants are present in soils at depths >1m where direct contact is possible, or 0.5-1.0m of ground where direct contact is not possible. b) Ground/groundwater contamination could be present on a light industrial unit constructed in the 1990s containing a UST in operation over the last 10 years – the tank is double skinned but there is no integrity testing or evidence of leakage.
Unlikely	There is a contaminant linkage, but circumstances are such that it is improbable that an event would occur even in the very long-term.	a) Elevated concentrations of toxic contaminants are present below hardstanding. b) Light industrial unit <10 years old containing a double skinned UST with annual integrity testing results available.

24.8.15 The classification of consequence is presented in **Table 24-16**.

Table 24-16 Classification of consequence

Classification	Human Health	Controlled Water	Geodiversity	Property/ Structures/ Crops and animals	Notes / Examples
Severe	Highly elevated concentration which is likely to result in "significant harm" to human health as defined by the Environmental Protection Act 1990, Part 2A, if exposure occurs.	Equivalent to Environment Agency Category 1 pollution incident including persistent and/or extensive effects on water quality; leading to closure of a potable abstraction point; major impact on amenity value or major damage to agriculture or commerce.	Major damage to a geodiversity site, which is likely to result in a substantial adverse change in its functioning or harm to a site of special interest that endangers the long-term maintenance of the site.	Catastrophic damage to crops, buildings or property.	Significant harm to humans is defined in the *Contaminated Land Statutory Guidance* (DEFRA, 2012) as death, life threatening diseases (for example, cancers), other diseases likely to have serious impacts on health, serious injury, birth defects, and impairment of reproductive functions. Major fish kill in surface water from large spillage of contaminants from site. Highly elevated concentrations of hazardous or priority substances present in groundwater close to small potable abstraction (high sensitivity). Explosion, causing building collapse (can also equate to immediate human health risk if buildings are occupied).

Classification	Human Health	Controlled Water	Geodiversity	Property/ Structures/ Crops and animals	Notes / Examples
Medium	Elevated concentrations which could result in "significant harm" to human health as defined by the Environmental Protection Act 1990, Part 2A if exposure occurs.	Equivalent to Environment Agency Category 2 pollution incident including significant effect on water quality; notification required to abstractors; reduction in amenity value or significant damage to agriculture or commerce.	Significant damage to a geodiversity site, which may result in a substantial adverse change in its functioning or harm to a site of special interest that may endanger the long-term maintenance of the site.	Significant damage to crops, buildings or property.	Exposure could lead to acute or chronic health effects which are significant as defined in the *Contaminated Land Statutory Guidance* (DEFRA 2012). Damage to building rendering it unsafe to occupy, for example, foundation damage resulting in instability. Ingress of contaminants through plastic potable water pipes.
Mild	Exposure to human health unlikely to lead to "significant harm".	Equivalent to Environment Agency Category 3 pollution incident including minimal or short-lived effect on water quality; marginal effect on amenity value, agriculture or commerce.	Minor or short-lived damage to a geodiversity site, which is unlikely to result in a substantial adverse change in its functioning or harm to a site of special interest that would endanger the long-term maintenance of the site.	Minor damage to crops, buildings or property.	Exposure could lead to slight short-term effects (for example, mild skin rash). Surface spalling of concrete.

Classification	Human Health	Controlled Water	Geodiversity	Property/ Structures/ Crops and animals	Notes / Examples
Minor	No measurable effects on humans.	Equivalent to insubstantial pollution incident with no observed effect on water quality or ecosystems.	Equivalent to insubstantial pollution incident with no observed effect on a geodiversity site or site of special interest.	Repairable effects of damage to buildings, structures.	The loss of plants in a landscaping scheme. Discoloration of concrete.

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24.8.16 The risk matrix to link the likelihood and consequence is shown in **Table 24-17**.

Table 24-17 Land Contamination Risk matrix

Likelihood / Potential Consequence	Unlikely	Low	Likely	High
Severe	Moderate/Low Risk	Moderate Risk	High Risk	Very High Risk
Medium	Low Risk	Moderate/Low Risk	Moderate Risk	High Risk
Mild	Very Low Risk	Low Risk	Moderate/Low Risk	Moderate Risk
Minor	Very Low Risk	Very Low Risk	Low Risk	Low Risk

24.8.17 The overall risk definitions are summarised in **Table 24-18**.

Table 24-18 Land Contamination Risk definitions

Risk	Definition
Very High	There is a high probability that severe harm could arise to a designated receptor from an identified hazard at the site without remediation action OR there is evidence that severe harm to a designated receptor is already occurring. Realisation of that risk is likely to present a substantial liability to the site owner/or occupier. Investigation is required as a matter of urgency and remediation works likely to follow in the short-term.
High	Harm is likely to arise to a designated receptor from an identified hazard at the site without remediation action. Realisation of the risk is likely to present a substantial liability to the site owner/or occupier. Investigation is required as a matter of urgency to clarify the risk. Remediation works may be necessary in the short-term and are likely over the longer term.
Moderate	It is possible that harm could arise to a designated receptor from an identified hazard. However, it is either relatively unlikely that any such harm would be severe, and if any harm were to occur it is more likely that the harm would be relatively mild. Further investigative work is normally required to clarify the risk and to determine the potential liability to site owner/occupier. Some remediation works may be required in the longer term.

Risk	Definition
Low	It is possible that harm could arise to a designated receptor from identified hazard, but it is likely at worst that this harm if realised would normally be mild. It is unlikely that the site owner/or occupier would face substantial liabilities from such a risk. Further investigative work (which is likely to be limited) to clarify the risk may be required. Any subsequent remediation works are likely to be relatively limited.
Very Low	It is a low possibility that harm could arise to a designated receptor, but it is likely at worst, that this harm if realised would normally be mild or minor.

Significance evaluation methodology

24.8.18 There is no established guidance on how to use the LCRM (Environment Agency, 2020) risk assessment approach as the basis for the evaluation of the significance of effects within the EIA process.

24.8.19 The methodology used in this assessment has, therefore, been developed using professional judgment, evaluating the change in risk from baseline conditions to those during and following the Proposed Development. In order to define the baseline risk the initial assessment and classification of risk is carried out for the Study Area in its pre-development state. A separate assessment of risk is then conducted for the site post-development (including environmental measures inherently embedded in the development) to enable an evaluation of the change in risk due to the Proposed Development.

24.8.20 In considering the post-development risks, embedded mitigation has been taken into account.

24.8.21 **Table 24-19** uses the risk classification pre- and post-development as the basis for a significance evaluation matrix for the purposes of EIA.

Table 24-19 Land Contamination significance evaluation matrix

			Risk Post-development (including embedded environmental measures)					
			Very Low	**Low**	**Moderate / Low**	**Moderate**	**High**	**Very High**
Risk Pre-development	**Existing Receptors**	**Very High**	Major Positive (Significant)	Major Positive (Significant)	Moderate Positive (Potentially Significant)	Moderate Positive (Potentially Significant)	Minor Positive (Not Significant)	Negligible (Not Significant)
		High	Major Positive (Significant)	Moderate Positive (Potentially Significant)	Moderate Positive (Potentially Significant)	Minor Positive (Not Significant)	Negligible (Not Significant)	Minor Negative (Not Significant)
		Moderate	Moderate Positive (Potentially Significant)	Moderate Positive (Potentially Significant)	Minor Positive (Not Significant)	Negligible (Not Significant)	Minor Negative (Not Significant)	Moderate Negative (Potentially Significant)
		Moderate / Low	Moderate Positive (Potentially Significant)	Minor Positive (Not Significant)	Negligible (Not Significant)	Minor Negative (Not Significant)	Moderate Negative (Potentially Significant)	Moderate Negative (Potentially Significant)
		Low	Minor Positive (Not Significant)	Negligible (Not Significant)	Minor Negative (Not Significant)	Moderate Negative (Potentially Significant)	Moderate Negative (Potentially Significant)	Major Negative (Significant)
		Very Low	Negligible (Not Significant)	Minor Negative (Not Significant)	Moderate Negative (Potentially Significant)	Moderate Negative (Potentially Significant)	Major Negative (Significant)	Major Negative (Significant)
	No Receptor Present Pre-development	**N/A**	Minor Negative (Not Significant)	Moderate Negative (Potentially Significant)	Moderate Negative (Potentially Significant)	Major Negative (Significant)	Major Negative (Significant)	Major Negative (Significant)
	Risks that remain at moderate, high or very high post-development may require further measures during the construction phase to mitigate those risks depending on the specific circumstances (for example remediation in line with LCRM). Where effects are indicated to be Potentially Significant in EIA terms based on the change in risk from pre- to post-development, professional judgement will be applied in this ES to determine whether they are Significant or Not Significant.							

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Risk Assessment – UXO

24.8.22 There is no established methodology for assessing the environmental effects from UXO in EIA terms. The methodology used in this assessment has, therefore, been developed based on professional judgement to consider the significance, in EIA terms, of the level of risk identified in the UXO desk study (included in **Appendix 24.1: Phase 1 geo-environmental desk study, Volume 4** of the ES (Document Reference: 6.4.24.1)).

24.8.23 The UXO Desk Study presents an overall UXO hazard for each part of the land required for Rampion 2, using a risk-based approach to classify the UXO hazard as either Very High, High, Moderate, Low or Very Low.

24.8.24 This assessment will consider the level of the hazard identified and any mitigation to be undertaken prior to and during construction of Rampion 2. Where post-mitigation the level of risk remains Very High or High, this will be considered significant in EIA terms.

Risk Assessment – Minerals Safeguarding

24.8.25 There is no established methodology for assessing the environmental effects of a development on mineral safeguarding. The methodology used in this assessment has, therefore, been developed based on the generic approach guidance detailed in **Chapter 5: Approach to the EIA, Volume 2** of the ES (Document Reference: 6.2.5).

24.8.26 A summary of the receptor sensitivity criteria is presented in **Table 24-20** and the criteria for evaluation of magnitude of effects is summarised in **Table 24-21**.

Table 24-20 Sensitivity criteria for minerals safeguarding

Sensitivity	Planning Designation
High	Existing minerals sites. Allocated minerals sites.
Medium	MSAs. Minerals/minerals infrastructure consultation areas.
Low	No mineral resources identified.
Negligible	No mineral resources identified.

Table 24-21 Evaluation of magnitude of effects for minerals safeguarding

Magnitude	Criteria
High	Development permanently prevents viable exploitation of a resource. Development directly and negatively affects the operation of an ongoing mineral extraction site to the extent that its viability is clearly and demonstrably reduced.
Medium	Development has permanent effects that will sterilise a significant proportion of a mineral deposit (excluding those under ongoing extraction). Development has temporary effects that sterilise a significant proportion of a mineral deposit (excluding those under ongoing extraction), but which would be expected to be reversed in the short to medium term.
Low	Development permanently affects a minor proportion of a mineral deposit, to an extent that is unlikely to significantly affect its overall viability or quality. Development has temporary effects that sterilise minor parts of a mineral deposit (excluding those under ongoing extraction), which would be expected to be reversed in the short to medium term.
Negligible	Development has no permanent or temporary effects on mineral deposits that would affect the ability to extract the deposits, their viability or their quality.

24.8.27 **Table 24-22** combines the sensitivity and magnitude of minerals safeguarding effects as the basis for a significance evaluation matrix for the purposes of EIA.

Table 24-22 Minerals safeguarding significance evaluation matrix

Magnitude / Sensitivity	Negligible	Low	Medium	High
High	Minor	Moderate	Major (significant)	Major (significant)
Medium	Negligible	Minor	Moderate	Major (significant)
Low	Negligible	Negligible	Minor	Moderate
Negligible	Negligible	Negligible	Negligible	Minor

24.8.28 The criteria mapped in **Table 24-20** is considered to correspond to the Policy requirements of the West Sussex Joint MLP (WSCC, 2021). Policy M9 of the MLP states that:

- *"(a) Existing minerals extraction sites will be safeguarded against non-mineral development that prejudices their ability to supply minerals in the manner associated with the permitted activities.*
- *(b) Soft sand (including potential silica sand), sharp sand and gravel, brick-making clay, building stone resources and chalk reserves are safeguarded against sterilisation. Proposals for non-mineral development within the Minerals Safeguarded Areas (as shown on maps in Appendix E) will not be permitted unless:*
  - *(i) Mineral sterilisation will not occur; or*
  - *(ii) it is appropriate and practicable to extract the mineral prior to the development taking place, having regards to the other policies in this Plan; or*
  - *(iii) the overriding need for the development outweighs the safeguarding of the mineral and it has been demonstrated that prior extraction is not practicable or environmentally feasible."*

24.8.29 The high and medium magnitude criteria present scenarios where an identified minerals resource would, or could, have its ability to supply minerals prejudiced. The high and medium magnitudes are the two categories where significant effects could occur (depending on the sensitivity of the minerals resource).

24.9 Assessment of effects: Construction phase

Overview

24.9.1 The following section details the assessment of ground condition effects for the construction phase of Rampion 2 and a summary of the assessment is presented in **Table 24-23** for ground conditions and **Table 24-24** for minerals safeguarding.

24.9.2 A figure summarising the ground conditions baseline on which this assessment is based is presented as **Figure 24.2a-v, Volume 3** of the ES (Document Reference: 6.3.24). A figure summarising the minerals safeguarding baseline is presented as **Figure 24.3, Volume 3** of the ES (Document Reference: 6.3.24).

GC-C-1 and GC-C-2 (Mobilisation of contamination from construction activities located on, or adjacent to landfills and other potentially contaminated sites)

24.9.3 Most of the onshore cable corridor and onshore substation site are located on agricultural land or adjacent to existing highways where there is not anticipated to be a significant risk from the presence of land contamination. However, the following potential sources of contamination that have the potential to impact on controlled waters and human health receptors have been identified in the desk study (**Appendix 24.1: Phase 1 geo-environmental desk study, Volume 4** of the ES (Document Reference: 6.4.24.1)).

- To the south of the River Arun a former sewage treatment works was present between 1974 and 1992. The treatment works is no longer present and is outside the onshore part of the ES Assessment Boundary, immediately adjacent to an existing access track to be used for access onto the onshore cable corridor. Accordingly, no physical works that interact with the former treatment works are anticipated.
- Just north of the River Arun, a historical landfill (known as Brook Barn Farm) is present within the Study Area. The landfill operated between circa 1970 and circa 1975 and is believed to have received only inert waste based on Environment Agency data. Two other areas of landfill are also shown in the same area (Old Mead Road and Ferry Road North) with the waste types accepted including inert, industrial, commercial and household wastes. Archaeological trial trenching undertaken in 2023 as part of Rampion 2 (**Chapter 25: Historic environment, Volume 2** of the ES (Document Reference: 6.2.25)) also identified an area to the northeast of the Brook Barn Farm landfill in which infilled made ground was present. The location of the landfills and infilled ground is shown on **Figure 24.2a-v, Volume 3** of the ES (Document Reference: 6.3.24). The onshore cable corridor passes through the eastern-most part of the permitted boundary of Brook Barn Farm and through the area of infilled ground to the northeast of the landfill. Therefore, there is risk from encountering land affected by contamination in these sections of the onshore cable corridor.
- Several areas of infilled land have been identified including ponds, former quarries and railway lines. Whilst these are not marked as landfills, made

ground used to infill these areas has the potential to be contaminated. However, it is noted that most of these areas are currently in agricultural use and, as shown on **Figure 24.2a-v, Volume 3** of the ES (Document Reference: 6.3.24), most of these areas are also on the edge or outside of the onshore cable corridor. Therefore, the risk from encountering land affected by contamination in the shallow soils where the cable trench will pass is considered to be low.

- Near Angmering, a historical landfill known as Swillage is present. The landfill is indicated to have been licenced to accept inert, commercial and household waste between 1950 and 1965. The location of the landfill is shown on **Figure 24.2a-v, Volume 3** of the ES (Document Reference: 6.3.24). The part of Swillage Lane to be used for permanent access does not require any alterations/enlargement and given the approximate 150m distance of the historical landfill from the onshore cable corridor itself, there will therefore be no direct interaction with the historical landfill. Accordingly, the risk from encountering land affected by contamination in the shallow soils where the onshore cable trench will pass is considered to be low.
- On the A27 near Polling, the onshore cable corridor and locations of both temporary and permanent accesses are adjacent to The Vinery Industrial Estate which, in its northern part, comprises light industrial warehouses built in circa 1990 (housing business including antiques dealers, a kitchen showroom and a small vehicle workshop) and in its southern part comprises offices and a distribution warehouse built in circa 2015. A land contamination assessment submitted to Arun District Council as part of the planning application for the buildings in the south of the industrial estate (planning application reference A/74/13 (Ashdown Site Investigation Limited, 2012)), located immediately adjacent to the onshore cable corridor indicates that risks to groundwater were assessed as low. On this basis, the risk of historic contamination from the industrial estate being encountered in the area of the onshore cable corridor where excavations will take place is considered to be limited.
- Near the village of Findon, a historical landfill known as Long Furlong is present. The landfill is indicated to have been licenced to accept inert waste in 1976 with waste accepted in 1982. The landfill is approximately 35m to the south of a temporary construction and permanent access heading to the north off Long Furlong (A280) and approximately 700m from the onshore cable corridor itself at its closest point. Based on the location of the access and the distance to the onshore cable corridor, there will be no direct interaction with the historical landfill and the risk of historic contamination from being encountered in the area where excavations will take place is therefore considered to be limited.
- Near the village of Washington, West Sussex, the onshore cable corridor passes along the A283 immediately adjacent to, but outside the boundary of, an authorised landfill known as Windmill Quarry, which is known from Environment Agency data to have taken household, commercial and industrial waste. The landfill operates under an Environment Agency environmental permit, which includes control measures to prevent pollution from landfill leachate and ground gas. However, no physical works for Rampion 2 will take place within the boundary of the landfill. Given the presence of active control

measures operated under the Environmental Permit, the risk of encountering contamination as part of the onshore cable corridor trenches for Rampion 2 is considered to be low.

- The onshore cable corridor connects to the existing National Grid Bolney substation and an extension to the existing substation forms part of the Proposed Development. Both of these areas are adjacent to the Rampion 1 onshore substation infrastructure which is present to the east. The Rampion 1 onshore substation infrastructure was built with the benefit of planning permission, which requires the site to be suitable for use in respect of land contamination, and no concerns were raised over land contamination by the Environment Agency or Mid Sussex District Council's contaminated land team[2]. Therefore, the risk of contamination from the existing National Grid Bolney Substation (which includes the Rampion 1 onshore substation infrastructure) being encountered as part of the onshore cable corridor trenches or substation extension works for Rampion 2 is considered to be low.
- The onshore substation at Oakendene is immediately adjacent to a small industrial estate (Oakendene Estates) with businesses including a vehicle repair workshop and scrap metal dealership. Whilst these potential sources of contamination are outside of the land required for this onshore substation site, a worst-case scenario has been considered in which contamination from the industrial estate extends into the onshore substation site.

24.9.4 It is noted that except for the Brook Barn Farm historical landfill and areas of infilled/made ground, none of these potential sources of contamination would be directly affected by Rampion 2. On this basis, the potential for mobilisation of contamination to controlled waters or human health receptors during the construction phase where the onshore cable corridor does not pass through these potential sources of contamination is considered to be unlikely and the consequences mild at worst. Therefore, there would be no change from the current baseline risk and the effect would be **Negligible**, which is **Not Significant** in EIA terms.

24.9.5 In the case of the areas where the onshore cable corridor passes through the potential sources of contamination (such as the Brook Barn Farm historical landfills and areas of infilled/made ground) the desk study (**Appendix 24.1: Phase 1 geo-environmental desk study, Volume 4** of the ES (Document Reference: 6.4.24.1)) indicates that for human health receptors, whilst the baseline likelihood is unlikely, the worst-case outcome would be severe which represents a moderate/low risk. In the case of controlled waters, the worst-case outcome is considered to be medium with a baseline likelihood of likely which represents a moderate risk.

24.9.6 The embedded environmental measures in **Table 24-14** include ground investigation prior to construction to ensure the land is suitable for the proposed use (C-71), control measures for encountering unexpected contamination (C-14

[2] Construction of two additional bays at the existing Bolney substation, planning reference 13/02342/FUL, 2013 and Discharge of Conditions for Rampion Offshore Windfarm Work Twineham, planning reference DM/15/0806, 2015 (Mid Sussex District Council, 2023).

and C-72) and control measures for management of potentially contaminated soils excavated during trenching to prevent generation of dusts and leaching of contamination (C-24 and C-143).

24.9.7 Consequently, whilst the probability of encountering contamination during construction increases by passing through these potential sources of contamination, the result of the embedded environmental measures is that the probability of a pollutant linkage being realised is reduced. As such, the overall 'likelihood' with Rampion 2 remains unchanged from that in the baseline (that is an unlikely likelihood in the case of human health receptors and a medium likelihood in the case of controlled waters). Therefore, the risks to controlled waters and human health receptors from the onshore cable corridor passing through potential sources of contamination during construction remain unchanged from the baseline (that is a moderate/low risk to human health receptors and a moderate risk to controlled waters receptors) and, therefore, the effect is **Negligible**, which is **Not Significant** in EIA terms.

GC-C-3 (Build-up of ground gases from construction activities located on, or adjacent to landfills and other potentially contaminated sites)

24.9.8 With the exception of the potential sources of contamination identified in the desk study, none of the proposed Rampion 2 infrastructure would be constructed on ground that is likely to generate ground gasses that could build up in the onshore cable corridor trenches or onshore substation infrastructure.

24.9.9 It is also noted that the onshore cable corridor will be backfilled in accordance with the Materials Management Strategy and only where that material is suitable for use (C-69 and C-143, **Table 24-14**). Material which is not suitable for use will be disposed offsite in line with the Waste Management Regulations (2006) (C-31). Therefore, any change to the potential for ground gas migration will be negligible from the baseline condition.

24.9.10 In the case of the potential sources of contamination in the desk study (**Appendix 24.1: Phase 1 geo-environmental desk study, Volume 4** of the ES (Document Reference: 6.4.24.1)), such as the Brook Barn Farm historical landfill and areas of infilled/made ground, the onshore cable corridor passes through a number of these areas and, therefore, a worst-case consequence from the build-up of gases (that is a gas explosion) of severe has been assigned.

24.9.11 However, the desk study (**Appendix 24.1: Phase 1 geo-environmental desk study, Volume 4** of the ES (Document Reference: 6.4.24.1)) information suggests that the historical landfill was backfilled using inert material, which would have a low potential for ground gas generation, and the areas of infilled/made ground are limited in extent. Therefore, the baseline likelihood is considered to be unlikely representing a moderate/low risk.

24.9.12 The embedded environmental measures in **Table 24-14** include for management of unexpected ground contamination and as such measures would be in place to amend the design of the onshore cable corridor (for example through installation of an impermeable lining) should ground gas be encountered during construction through the historical landfill.

24.9.13 Based on the above, the likelihood of Rampion 2 creating a preferential pathway for ground gas migration to human health receptors remains unlikely. Accordingly, the construction risk would be moderate/low and, therefore, the effect is **Negligible**, which is **Not Significant** in EIA terms.

GC-C-4 (Damage to infrastructure from construction activities located on, or adjacent to landfills and other potentially contaminated sites)

24.9.14 The desk study data (**Appendix 24.1: Phase 1 geo-environmental desk study, Volume 4** of the ES (Document Reference: 6.4.24.1)) indicates a number of areas within the Study Area where geohazards such as aggressive ground conditions, compressible ground and clay shrinkage may be present.

24.9.15 In a number of locations, the onshore cable corridor passes within 100m of existing residential and commercial properties and the consequence of a ground failure as a result of the Proposed Development would therefore be a medium consequence.

24.9.16 Rampion 2 includes commitments to the design of infrastructure in general accordance with design standards (C-116, **Table 24-14**) which would take into account the potential for geohazards including aggressive ground conditions and the effect on dewatering and appropriate measures such as sulphate resistant concrete or cut-off trenches would be implemented as part of the construction methodology. The design standards would also take into account the requirement for climate change resilience (for example the design of infrastructure to tolerate earth movement or subsidence which might be caused by flooding or drought).

24.9.17 In addition, it is noted that none of the proposed infrastructure for Rampion 2 such as joint bays or the onshore substation are proposed to be built on potentially contaminated sites and, therefore, the likelihood of damage to infrastructure from the presence of ground contamination is unlikely.

24.9.18 Accordingly, the baseline and construction risk would be low and, therefore, the effect is **Negligible**, which is **Not Significant** in EIA terms.

GC-C-5 (Damage to geological sites from construction activities located near to sites of geological importance)

24.9.19 The desk study (**Appendix 24.1: Phase 1 geo-environmental desk study, Volume 4** of the ES (Document Reference: 6.4.24.1)) indicates that there are two LIGS within the Study Area as shown on **Figure 24.2a-v, Volume 3** of the ES (Document Reference: 6.3.24). Warningcamp Quarry at Warningcamp, West Sussex, lies approximately 150m north of a temporary construction and permanent light vehicle access off Blakehurst Lane. Rock Common Sand Quarry at Washington, West Sussex, lies immediately adjacent to but outside the onshore cable corridor.

In line with embedded environmental measure C-6 (**Table 24-14**) the design of the onshore cable corridor has been chosen to avoid direct interaction with sites of natural importance (which includes LIGS).

24.9.20 Whilst the consequence of damage to a LIGS would be medium, damage to, or detrimental impact will only occur where the Proposed Development is built directly on or through such a site. Given the temporary construction and permanent light vehicle accesses and onshore cable corridor for Rampion 2 do not directly interact with Warningcamp Quarry or Rock Common Sand Quarry, the likelihood is unlikely that a detrimental impact will occur and accordingly the risk would be low.

24.9.21 Given that there would be no change from the current baseline risk during the construction phase the effect of Rampion 2 on the LIGS is **Negligible**, which is **Not Significant** in EIA terms.

GC-C-6 (Damage to property and infrastructure from UXO encounter during construction activities)

24.9.22 As noted in the UXO Desk Study (included in **Annex C, Appendix 24.1: Phase 1 geo-environmental desk study, Volume 4** of the ES (Document Reference: 6.4.24.1)), the majority of the Study Area is classified as having a low UXO hazard with an area of moderate to high UXO hazard identified where the onshore cable corridor passes through the former World War II South Downs Training Area between Warningcamp and Washington. There is potential for ordnance in the areas of moderate and high UXO hazard to include items found at the surface. These hazard levels represent a likelihood of low or likely respectively.

24.9.23 In areas where there is a low UXO hazard, UXO awareness has been included as part of embedded environmental measure C-70 (**Table 24-14**) within the **Outline CoCP** (Document Reference: 7.2) to implement the recommendations of the UXO Desk Study. No further mitigation is recommended by the UXO Desk Study and given the hazard level, the effects from UXO in these areas is considered to be **Not Significant** in EIA terms.

24.9.24 In the moderate or high UXO hazard areas, intrusive temporary construction activities would increase the likelihood of a UXO encounter. Further detailed UXO risk mitigation will be undertaken during construction in line with the recommendations of the UXO Desk Study (in addition to the UXO awareness included in the **Outline CoCP** (Document Reference: 7.2) and this requirement has been included as part of the embedded environmental measure C-70 (**Table 24-14**).

24.9.25 The risks mitigation proposed in the UXO Desk Study comprises a number of elements including:

- non-intrusive geophysical surveys by a UXO specialist to identify potential anomalies which could represent buried UXO and which can either be avoided (through micrositing of the onshore cable corridor) or investigated and removed;
- magnetometer surveys during deep borehole or trenching activities to clear intrusive works down to the maximum anticipated bomb penetration depth with potential anomalies investigated or removed; and
- supervision of works by an Explosive Ordnance Clearance (EOC) engineer.

24.9.26 As outlined in **paragraph 24.9.25**, where the further surveys identify potential anomalies, these can either be avoided (through micrositing of the onshore cable corridor) or removed by the EOC engineer. Where UXO is removed by the EOC engineer, appropriate mitigation would be put in place to minimise the risks to surrounding people and property.

24.9.27 At present the majority of the moderate and high UXO hazard areas comprise agricultural land which is ploughed and where at present it is unlikely that UXO mitigation such as that set out in the UXO Desk Study is in place by the owners of that land. Therefore, implementing the recommended mitigation in the UXO Desk Study (secured through the **Outline CoCP** (Document Reference: 7.2) and embedded environmental measures) is considered to firstly reduce the likelihood of a UXO encounter during construction and secondly, should a potential UXO be encountered, manage that encounter through specialist EOC engineers.

24.9.28 Consequently, having embedded the mitigation recommendation from the UXO Desk Study (**Annex C, Appendix 24.1: Phase 1 geo-environmental desk study, Volume 4** (Document Reference: 6.4.24.1)) into the construction phase, the potential for encountering UXO and for damage/harm in the event of a UXO encounter in the areas of moderate and high hazard UXO areas will have been reduced to as low as reasonably practicable and the effect of Rampion 2 in these areas is considered to be **Not Significant** in EIA terms.

GC-C-7 (Accidental spillages and leaks impacting controlled waters during construction activities)

24.9.29 The temporary construction activities for Rampion 2 include the setup of temporary construction compounds to facilitate the onshore cable corridor construction and temporary construction works on the onshore substation location itself. All these temporary construction activities, regardless of the location of the temporary construction compounds, will require the storage of fuels including the refuelling of plant and machinery, which have the potential to cause fuel losses either as a result of loss of bulk containment or from minor leaks/spills.

24.9.30 In addition, the trenchless crossings will require the use of drilling fluids to be stored at the trenchless crossing site with the potential for a release from loss of bulk containment.

24.9.31 The embedded environmental measures detailed in **Table 24-14** include a number of measures to limit the potential for accidental spillages and leaks during construction (C-8, C-76, C-149, C-150, C-151 and C-167 outlined in **Table 24-14**), incorporating requirements for secondary containment of bulk fuel storage in line with best practice containment guidance, locating of bulk storage and refuelling activities on an impermeable surface and development of incident response plans to promptly deal with incidents.

24.9.32 The drilling fluids used during trenchless crossings are bentonite-based muds which are not classified as environmentally hazardous and do not contain groundwater hazardous substances (embedded environmental measure C-245) and, therefore, a loss of containment would be mild at worst.

24.9.33 In addition, embedded environmental measures C-8, C-76, C-149, C-150, C-151 and C-167 (**Table 24-14**) include measures to reduce the severity of a spillage, for

example through citing of fuel storage on an impermeable surface, not storing hazardous materials within a SPZ or immediately adjacent to surface water receptors. The embedded environmental measures also include measures to mitigate the risks associated with a loss of drilling muds and breakout events during trenchless crossing operations (C-234 and C-241).

24.9.34 Consequently, whilst the consequence of a spillage could be mild, such a spillage both at baseline and with these measures in place would be unlikely, which represents a very low risk.

24.9.35 Therefore, the effect of Rampion 2 would be **Negligible**, which is **Not Significant** in EIA terms.

GC-C-8 (Construction activities located within or near to minerals sites, preferred areas or safeguarding areas)

Building Stone

24.9.36 The northern end of the onshore part of the proposed DCO Order Limits falls within a building stone MSA. Information available from the BGS indicates this comprises two thin strips of the MSA which extend east away from Cowfold.

24.9.37 The WSCC (2020a) Minerals and Waste Safeguarding Guidance advises that, due to the extent of the safeguarded resource and the low level of demand, it should be considered whether a proposal may lead to sterilisation of building stone resources that are important for the repair of historic buildings.

24.9.38 No existing building stone quarries exist in the area of the MSA or within proximity of the onshore part of the proposed DCO Order Limits and the Joint Minerals Local Plan (WSCC, 2018) identifies that there are only four active building stone quarries in the county.

24.9.39 The magnitude of effect is therefore considered to be Low. The sensitivity of the building stone resource is Medium and therefore, the effect of Rampion 2 will be **Minor Negative**, which is **Not Significant** in EIA terms.

Brick Clay

24.9.40 A section of the onshore part of the proposed DCO Order Limits lies within the brick clay MSA (see **Figure 24.3, Volume 3** of the ES (Document Reference: 6.3.24)). Information in the WSCC (2018) Joint Minerals Local Plan indicates that three of the active brickworks have more than 25 years of clay reserves and one has 24 years. The brickworks at West Hoathly had less than ten years reserves but the Joint Minerals Local Plan (WSCC, 2018) identifies a strategic mineral site allocation for this brickworks.

24.9.41 With the extensive resource available, the fact that less than 1% of the MSA will be affected and there is a relatively healthy landbank position/ allocated site, the magnitude of effect is considered to be Negligible. The sensitivity of the brick clay resource is Medium and therefore the effect of Rampion 2 will be Negligible, which is **Not Significant** in EIA terms.

Soft Sand

24.9.42 The onshore cable corridor passes through a soft sand MSA (see **Figure 24.3, Volume 3** of the ES (Document Reference: 6.3.24)). In its response to the Scoping Opinion (Planning Inspectorate, 2020a), WSCC states that soft sand is a rare resource, the potential for sterilisation of which needs to be firstly avoided where possible and secondly assessed within the EIA.

24.9.43 As the MSA runs perpendicular to the southwest to northwest alignment of the onshore cable corridor between Washington and Wiston it is not possible to avoid the MSA. The onshore cable corridor will interact with approximately 8.2ha of land within the MSA which is less than 0.1% of the total MSA. This area consists of a thin strip of land running mainly alongside the southern side A283, from the junction with The Hollow in the west to the Sussex Timber Company sawmill in the east.

24.9.44 The MSA also extends to the north of the A283 in this area, however the MSA on the northern side of the road was the former Windmill Quarry (sand) and landfill site. It can be expected that either all of the soft sand resource in this area has been previously extracted, or that any remaining resource is now sterilised by the landfilling operations, and therefore there is no viable resource remaining in this area.

24.9.45 To the south of the A283, in the western half of this area, the extent of the MSA within the onshore cable corridor is unlikely to be sufficient to allow a viable extraction site to be developed. The MSA here forms a strip of land which is no wider than 160m and the need to offset from the A283 would further narrow the land available.

24.9.46 In the eastern half of this area (a corridor between Lower Chancton Farm and the Sussex Timber Company) there is potentially more scope for a viable extraction site. An area of land approximately 4.5ha is covered by the proposed DCO Order Limits in this area. If minerals extraction takes place in this location, there will need to be a buffer from the adjacent highway and minerals extraction will therefore not take place within that buffer. In relation to existing quarries in the nearby area, similar buffers are at least 35m wide. Due to this highways buffer, and the proximity to the buildings at Lower Chancton Farm (including Listed Buildings and residential properties) and the Sussex Timber company, some of the MSA in this area is already sterilised. The onshore cable corridor will be approximately 40m wide, and depending on the exact configuration of the onshore cable route within the proposed DCO Order Limits, a worst case scenario of 2.9ha of land will therefore be sterilised during construction of the Proposed Development.

24.9.47 Information from the current planning application at Rock Common Quarry indicates that there is a sand and gravel seam of up to 40m thick at the quarry. Historic borehole records held by the BGS (2020) indicate sand and gravel deposits of at least 33m in the Lower Chancton Farm area. This resource has not been assessed to check economic viability, but if it is assumed it was viable and a similar 40m thick seam is available in this land, then a worst-case scenario of 1,160,000m^3 of sand could be sterilised during the construction of the Proposed Development.

24.9.48 The **Outline CoCP** (Document Reference: 7.2) submitted with the DCO Application commits to a Materials Management Plan (MMP) being produced prior to the commencement of construction, within which a dedicated section on minerals would be provided. The MMP will be produced as a bespoke document, relevant to each phase of construction that takes place. The **Outline CoCP** (Document Reference: 7.2) commits the MMP to "*seek to maximise the reuse of excavated minerals from the onshore cable construction corridor as a resource, where they remain available following reinstatement works and where their use is practicable and feasible~~seek to maximise the reuse of excavated clean materials from the onshore cable construction corridor where practicable and feasible~~".* This would minimise the amount of sand sterilised, however, due to the depth of the sand seam here, it would not allow for the full re-use of all sands in this area. The depth of sand that would need to be excavated and the volume of infill needed to then re-create a suitable landform would make construction of the onshore cable corridor in this area unviable.

24.9.49 The sand here would therefore be sterilised for the duration of the construction and operation and maintenance phases of the Proposed Development, although once the onshore cable was decommissioned, the cable could be removed by a minerals developer to gain access to the resource.

24.9.50 As detailed in **Table 24-20**, the sensitivity of the soft sand resource is **Medium and** during the construction phase, the magnitude of change is **High**. The effect of Rampion 2 will therefore be **Major Negative**, which is **Significant** in EIA terms.

Chalk

24.9.51 The chalk MSA is tightly defined around existing sites, the closest of which is Washington Chalk Quarry (see **Figure 24.3, Volume 3** of the ES (Document Reference: 6.3.24)).

24.9.52 Given the closest point of the onshore cable corridor is over 700m to the north of the quarry, there will be **No Effect** on the viability of their operations.

MCAs

24.9.53 There are a number of active mineral sites around Storrington in close proximity to the onshore cable corridor which coincide with the minerals infrastructure MCAs (see **Figure 24.3, Volume 3** of the ES (Document Reference: 6.3.24)), including:

- Rock Common Quarry (where minerals extraction was expected to cease in December 2020 but a planning application to extend this for up to 10 years from the date of the planning application determination is under consideration by WSCC);
- Washington Sand Pit (where minerals extraction ceased in December 2019 although a planning application to continue extraction for up to two years from the date of the planning application determination is under consideration by WSCC);
- Sandgate Park Quarry;
- Chantry Sand Pit; and

- Washington Chalk Quarry.

24.9.54 It is considered that these sites are sufficiently distant from the onshore cable corridor (in the case of Sandgate Park Quarry, Chantry Sand Pit and Washington Chalk Pit) or only close to access points for the onshore cable corridor (in the case of Washington Sand Pit) such that there will be **No Effect** on the viability of their operations.

24.9.55 Rock Common Quarry lies immediately adjacent to the onshore cable corridor. However, the areas of the quarry which lie closest to the onshore cable corridor have all been previously worked and are now largely restored to woodland. If any future extraction was to occur at the quarry, this will therefore take place in the northern parts of the quarry, further away from the onshore cable corridor. In addition, it is noted that Rampion 2 will not impact the ability of Rock Common Quarry to operate as a business. Consideration of the impact of vehicle movements from Rampion 2 is included in the assessment which forms part of **Chapter 23: Transport, Volume 2** of the ES (Document Reference: 6.2.23) and **Chapter 32: ES Addendum, Volume 2** (Document Reference 6.2.32) **[REP5-038]**.

24.9.56 The magnitude of effect on the Rock Common MCA is therefore considered to be **Negligible**. The sensitivity of the MCA is **High** and therefore the effect of Rampion 2 will be **Minor Negative**, which is **Not Significant** in EIA terms.

Allocated Minerals Sites

25.1.1 There are two proposed strategic minerals site allocations in proximity to the onshore cable corridor (see **Figure 24.3, Volume 3** of the ES (Document Reference: 6.3.24)), namely:

- Ham Farm, Steyning; and
- Chantry Lane Extension.

24.9.57 However, it is considered that these proposed allocations are sufficiently distant from the onshore cable corridor (both over 500m away) such that there will be **No Effect** on their future viability.

24.10 Assessment of effects: Operation and maintenance phase

Overview

24.10.1 The following section details the assessment of ground condition effects for the operation and maintenance phase of Rampion 2 and a summary of the assessment is presented in **Table 24-23** for ground conditions and **Table 24-24** for minerals safeguarding.

GC-O-1, GC-O-2 and GC-O-3 (Risks to human health and controlled waters from presence of artificial ground, disturbed landfill or other excavated and reused material)

24.10.2 Rampion 2 includes embedded environmental measures (**Table 24-14**) during the construction phase for the development of a MMP for the reuse of soils within the onshore cable corridor (C-69) and for dealing with potentially contaminated soils requiring disposal as opposed to reuse (C-31) (**Table 24-14**).

24.10.3 In addition, the design of Rampion 2, as detailed in embedded environmental measure C-71 (**Table 24-14**) will ensure that the land required for the construction will be suitable for the proposed use in line with LCRM guidance (Environment Agency, 2020).

24.10.4 Accordingly, the potential for land contamination risk to increase during the operation and maintenance phase from inappropriate reuse of materials generating a build-up of ground gas or landfill leachate or from aggressive ground conditions is not likely. On this basis, the effects of Rampion 2 on controlled waters and human health receptors during the operation and maintenance phase are considered to be **Negligible,** which is **Not Significant** in EIA terms.

GC-O-4 (Accidental spillages and leaks impacting controlled waters during operation and maintenance activities)

24.10.5 During the operation and maintenance phase, activities which could give rise to accidental spillages and leaks will be limited to those taking place at the onshore substation.

24.10.6 It can reasonably be expected that whilst the impact of any individual spillage/leak would be similar to that during the construction phase, the likelihood of a spillage/leak will be significantly reduced owing the absence of large-scale construction vehicles and storage of associated fuels/liquids.

24.10.7 As detailed in embedded environmental measure C-153 (**Table 24-14**) the operational management of the onshore substation facilities will include environmental measures to prevent spillages of oils and other substances through development of a PICP which will incorporate, for example, the use of hardstanding, spill kits and the presence of operational controls.

24.10.8 In addition, it is noted that the cables within the onshore cable corridor will not be oil filled and, therefore, there is no risk of leaks/spillages from damaged cables that would result in pollution of controlled waters.

24.10.9 Therefore, the consequence of an operational spill is considered to be mild, the likelihood is considered to be unlikely, which presents a very low risk. On this basis, the effects of Rampion 2 during operation and maintenance are considered to be **Negligible**, which is **Not Significant** in EIA terms.

GC-O-5 (Permanent infrastructure located within or near to minerals sites, preferred areas or safeguarding areas)

24.10.10 The likely significant effects for minerals safeguarding only occur where land is temporarily or permanently taken for the onshore elements of the Proposed Development. All effects associated with construction of the Proposed Development will be temporary, whilst some of the land utilised will be subject to permanent easement during the operation and maintenance phase. For the building stone, brick clay and chalk MSAs, and the MCAs, the construction phase conclusions are also considered to be relevant to the operation and maintenance phase due to the scale of effects identified.

24.10.11 For the Soft Sand MSA, the sterilisation effects realised during the construction phase on the sterilisation of the sand resource will continue through the operation and maintenance phase due to the presence of the onshore cable restricting minerals extraction in the vicinity. As detailed in **Table 24-20**, the sensitivity of the soft sand resource is **Medium** and the magnitude of change is **High**. The Proposed Development will therefore lead to **Major Negative** effect, which will be temporary (for the 30 year operation and maintenance phase) and is **Significant** in EIA terms.

24.11 Assessment of effects: Decommissioning phase

Overview

25.1.2 The following section details the assessment of ground condition effects for the decommissioning phase of Rampion 2 and a summary of the assessment is presented in **Table 24-23**.

GC-D-1, GC-D-2 and GC-D-3 (Risks to human health and controlled waters during decommissioning activities)

24.11.1 Onsite disassembly of equipment and demolition of structures would have greatest potential for soil or groundwater contamination due to spills, leaks and waste generated.

24.11.2 It is also anticipated that the onshore electrical cables will be left in-situ with ends cut, sealed and buried to minimise effects associated with removal.

24.11.3 The detail and scope of the decommissioning for the remaining onshore infrastructure will be determined by the relevant legislation and guidance at the time. As detailed in embedded environmental measure C-2<u>40</u>~~39~~ (**Table 24-14**), the decommissioning phase will be subject to a decommissioning plan, approved by the Local Authority, including similar environmental measures to those for the construction phase of Rampion 2.

24.11.4 As such, for the purposes of a worst-case scenario, impacts no greater than those identified for the construction phase are expected for the decommissioning phase.

24.11.5 Accordingly, the effects during decommissioning are considered, at worse, to be **Negligible** (for GC-D-1 and GC-D-2 which are equivalent to GC-C-1 and GC-C-2)

and **Negligible** (for GC-D-3 which is equivalent to GC-C-7), which are **Not Significant** in EIA terms.

GC-D-4 (Permanent infrastructure located within or near to minerals sites, preferred areas or safeguarding areas)

24.11.6 The significant negative effects identified in regards to the soft sand MSA during the construction and operation and maintenance phases will be reversed on the decommissioning of the onshore cable. Whilst the onshore cable will be left *in situ* as part of the decommissioning works, there will be no barrier to a minerals developer removing the onshore cable in this area to access the sand resource.

24.11.7 A worst-case scenario would see some sand lost during the onshore cable removal works, the sensitivity of the soft sand resource is **Medium** and the magnitude of change is **Negligible**. This will result in a permanent **Minor Negative** effect which is **Not Significant** in EIA terms.

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Table 24-23 Summary of ground conditions assessment

	Baseline Assessment			Assessment with Rampion 2			Change in Risk (Significance)
	Likelihood	**Consequence**	**Risk**	**Likelihood**	**Consequence**	**Risk**	
Construction[3]							
GC-C-1 and GC-C-2 Mobilisation of contamination to human health and controlled waters receptors from construction activities located outside of potential sources of contamination	Unlikely	Minor / Mild	Very low	Unlikely	Minor / Mild	Very low	**Negligible** (**Not Significant**)
GC-C-1 Mobilisation of contamination to human health receptors from construction activities located on, or adjacent to landfills and other potentially contaminated sites (where	Likely	Medium	Moderate	Likely	Medium	Moderate	**Negligible** (**Not significant**)

[3] Based on the findings of the assessment presented in **Section 24.9**, the construction linkage references GC-C-1 to GC-C-3 have been split in this table to separately summarise the assessment of effects from where the onshore cable corridor passes through potential sources of contamination to those from outside of potential sources of contamination. Linkage reference GC-C-6 has also been split to separately summarise the assessment of effects from where the onshore cable corridor passes through areas of moderate to high UXO hazard to those in low UXO hazard areas.

	Baseline Assessment			Assessment with Rampion 2			Change in Risk (Significance)
	Likelihood	**Consequence**	**Risk**	**Likelihood**	**Consequence**	**Risk**	
onshore cable corridor passes through potential sources of contamination)							
GC-C-2 Mobilisation of contamination to human health receptors from construction activities located on, or adjacent to landfills and other potentially contaminated sites (where onshore cable corridor passes through potential sources of contamination)	Unlikely	Severe	Moderate / Low	Unlikely	Severe	Moderate / Low	**Negligible** (**Not significant**)
GC-C-3 Build-up of ground gases from construction activities located outside of potential sources of contamination	Unlikely	Severe	Moderate / Low	Unlikely	Severe	Moderate / Low	**Negligible** (**Not Significant**)
GC-C-3 Build-up of ground gases from construction activities located on, or adjacent to landfills and other potentially	Unlikely	Severe	Moderate / Low	Unlikely	Severe	Moderate / Low	**Negligible** (**Not significant**)

	Baseline Assessment			Assessment with Rampion 2			Change in Risk (Significance)
	Likelihood	**Consequence**	**Risk**	**Likelihood**	**Consequence**	**Risk**	
contaminated sites (where onshore cable corridor passes through potential sources of contamination)							
GC-C-4 Damage to infrastructure from construction activities located on, or adjacent to landfills and other potentially contaminated sites	Unlikely	Medium	Low	Unlikely	Medium	Low	**Negligible** (**Not significant**)
GC-C-5 Damage to geological sites from construction activities located near to sites of geological importance	Unlikely	Medium	Low	Unlikely	Medium	Low	**Negligible** (**Not significant**)
GC-C-6 Damage to property and infrastructure from UXO	N/A	N/A[4]	N/A	Negligible	Negligible	Negligible	**Not significant**

[4] As outlined in **Section 24.8**, the assessment considers the overall risk from UXO based on the level of hazard presented in the UXO Desk Study **Annex C, Appendix 24.1: Phase 1 geo-environmental desk study, Volume 4** of the ES (Document Reference: 6.4.24.1). Therefore, a separate baseline assessment is not applicable to this linkage.

	Baseline Assessment			Assessment with Rampion 2			Change in Risk (Significance)
	Likelihood	**Consequence**	**Risk**	**Likelihood**	**Consequence**	**Risk**	
encounter during construction activities (where onshore cable corridor passes through low UXO hazard areas)							
GC-C-6 Damage to property and infrastructure from UXO encounter during construction activities (where onshore cable corridor passes through moderate to high UXO hazard areas)	N/A[4]	N/A	N/A	Minor Negative	Minor Negative	Minor Negative	**Not significant**
GC-C-7 Accidental spillages and leaks impacting controlled waters during construction activities	Unlikely	Mild	Very Low	Unlikely	Mild	Very Low	**Negligible (Not significant)**
Operation and maintenance							
GC-O-1 Risks to human health from presence of artificial ground	Likely	Medium	Moderate	Likely	Medium	Moderate	**Negligible (Not significant)**

	Baseline Assessment			Assessment with Rampion 2			Change in Risk (Significance)
	Likelihood	**Consequence**	**Risk**	**Likelihood**	**Consequence**	**Risk**	
disturbed landfill or other excavated and reused material							
GC-O-2 **Risks to land and property receptors from presence of artificial ground, disturbed landfill or other excavated and reused material**	Unlikely	Mild	Very Low	Unlikely	Mild	Very Low	**Negligible** (**Not significant**)
GC-O-3 **Risks to controlled waters from presence of artificial ground, disturbed landfill or other excavated and reused material**	Unlikely	Severe	Moderate / Low	Unlikely	Severe	Moderate / Low	**Negligible** (**Not significant**)
GC-O-4 **Accidental spillages and leaks impacting controlled waters during operation and maintenance activities**	Unlikely	Mild	Very Low	Unlikely	Mild	Very Low	**Negligible** (**Not significant**)
Decommissioning							

	Baseline Assessment			Assessment with Rampion 2			Change in Risk (Significance)
	Likelihood	**Consequence**	**Risk**	**Likelihood**	**Consequence**	**Risk**	
GC-D-1 **Risks to controlled waters from mobilisation of contamination during decommissioning activities**	Likely	Medium	Moderate	Likely	Medium	Moderate	**Negligible** (**Not Significant**)
GC-D-2 **Risks to human health from mobilisation of contamination during decommissioning activities**	Unlikely	Severe	Moderate / Low	Unlikely	Severe	Moderate / Low	**Negligible** (**Not significant**)
GC-D-3 **Accidental spillages and leaks impacting controlled waters during decommissioning activities**	Unlikely	Mild	Very Low	Unlikely	Mild	Very Low	**Negligible** (**Not significant**)

Table 24-24 Summary of minerals safeguarding assessment

Receptor	Sensitivity of receptor	Magnitude of effect	Level of effect	Significance of effect
Construction activities located within or near to minerals sites, preferred areas or safeguarding areas (GC-C-8)				
Building stone MSA	Medium	Low	Minor Negative	**Not Significant**
Brick clay MSA	Medium	Negligible	Negligible	**Not Significant**
Soft sand MSA	Medium	High	Major Negative	**Significant**
Chalk MSA	Medium	No Effect	No Effect	**Not Significant**
Minerals Consultation Areas (Washington /Hampers lane Sand Pit, Sandgate Park Quarry, Chanty Sand Pit and Washington Chalk Quarry)	High	No Effect	No Effect	**Not Significant**

Receptor	Sensitivity of receptor	Magnitude of effect	Level of effect	Significance of effect
Minerals Consultation Areas **Rock Common Quarry**	High	Negligible	Minor Negative	**Not Significant**
Allocated minerals sites	High	No Effect	No Effect	**Not Significant**
Operation and maintenance of permanent infrastructure located within or near to minerals sites, preferred areas or safeguarding areas (GC-O-5)				
The likely significant effects for minerals safeguarding only occur where land is temporarily or permanently taken for the onshore elements of the Proposed Development. Therefore, for the Building Stone, Brick Clay and Chalk MSAs, and the MCAs, the potential for significant mineral safeguarding effects to occur following completion of the temporary construction activities (i.e. in the operation and maintenance phase) is considered to have been taken into account in the construction phase assessment.				
Soft Sand MSA	Medium	High	Major Negative	**Significant**
Decommissioning of permanent infrastructure located within or near to minerals sites, preferred areas or safeguarding areas (GC-D-4)				
Soft Sand MSA	Medium	Negligible	Minor Negative	**Not Significant**

24.12 Assessment of cumulative effects

Approach

24.12.1 A cumulative effects assessment (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).

24.12.2 The onshore screening approach follows the Planning Inspectorate's Advice Note Nine (Planning Inspectorate, 2018) and 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

24.12.3 For ground conditions, including minerals safeguarding, 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 ZOI has been defined as an area 500m from the edge of the onshore cable corridor and 1km around the land required for the onshore substation. The ZOI accounts for shared receptors which could experience an effect from both Rampion 2 and 'other developments' when considering the maximum extent of the ZOI used to determine ground condition effects from Rampion 2 alone (250m and 500m for the onshore cable corridor and onshore substation site respectively).

24.12.4 A short list of 'other developments' that may interact with the Rampion 2 ZOIs during the construction, operation and maintenance or decommissioning phases is presented in **Appendix 5.4: Cumulative effects assessment shortlisted developments, Volume 4** of the ES (Document Reference: 6.4.5.4) and on **Figures 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 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.

24.12.5 The ground conditions cumulative assessment ZOI is shown in **Figure 24.4, Volume 3** of the ES (Document Reference: 6.3.24). Only those developments in the short list that fall within the ground conditions ZOI have the potential to result in cumulative effects with the Proposed Development either through introduction of a new contaminative source or sensitive receptor or through a combined impact on the same receptor. Therefore, all developments falling outside the ground conditions ZOI are excluded from this assessment.

24.12.6 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.

24.12.7 On the basis of the above, the 'other developments' that are scoped into the ground conditions CEA are outlined in **Table 24-25**.

Table 24-25 Developments considered as part of the ground conditions CEA

ID[5]	Development type	Development name	Application reference	Status	Confidence in assessment	Tier[6]	Distance to Rampion 2 (m)
11	Leisure Golf course including associated buildings and infrastructure	Bognor Regis Golf Club	M/16/22/PL	Application pending a decision: submitted 11/02/2022	High	1	457
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	Within proposed DCO Order Limits

[5] 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).
[6] **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[5]	Development type	Development name	Application reference	Status	Confidence in assessment	Tier[6]	Distance to Rampion 2 (m)
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	146
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	375
20	Industrial (materials) Construction (concrete batching plant)	Unit H6 Rudford Industrial Estate	CM/56/19/PL	Application approved 29/05/2020	High	1	392

ID[5]	Development type	Development name	Application reference	Status	Confidence in assessment	Tier[6]	Distance to Rampion 2 (m)
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	199
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	Within proposed DCO Order Limits
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	425
35	Mixed use	Land north of Water Lane	A/40/18/OUT	Application approved 27/08/19	High	1	412

ID[5]	Development type	Development name	Application reference	Status	Confidence in assessment	Tier[6]	Distance to Rampion 2 (m)
	Housing and commercial development						
36	Mixed Use 160 dwellings with public open space	Land off Arundel Road	A/122/19/OUT	Application approved 17/03/2020	High	1	211
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	Within proposed DCO Order Limits
42	Industry (resource extraction) Continuation of working the mineral (sand extraction), but with an enhanced	Sandgate Park Quarry	WSCC/044/18/SR	Application approved 08/01/2020	High	1	79

ID[5]	Development type	Development name	Application reference	Status	Confidence in assessment	Tier[6]	Distance to Rampion 2 (m)
	restoration scheme for nature conservation and informal recreation						
48	Energy storage Battery Energy Storage Facility	Battery Energy Storage Facility at Bolney	DM/21/0792	EIA Not Required 19/03/2021	Low	3	62
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	59
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	293

ID[5]	Development type	Development name	Application reference	Status	Confidence in assessment	Tier[6]	Distance to Rampion 2 (m)
51	Energy storage Proposed energy storage system and associated equipment	Ghyll Farm	DM/20/2554	Negative screening decision (EIA not required): decision 06/08/2020	Low	3	Within proposed DCO Order Limits
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	Within proposed DCO Order Limits
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	Within proposed DCO Order Limits
54	Energy generation (solar) Solarvoltaic panels and associated infrastructure	Land at Coombe Farm	DM/15/0644	Application approved 17/02/2017	High	1	21

ID[5]	Development type	Development name	Application reference	Status	Confidence in assessment	Tier[6]	Distance to Rampion 2 (m)
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	Within proposed DCO Order Limits
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	Within proposed DCO Order Limits
58	Energy generation (solar) Solar PV system for domestic use	The Barns Solar System	DM/22/2749	Application approved 08/12/2022	High	1	98

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24.12.8 A number of the ‘other developments’ have been approved with conditions requiring environmental ground conditions measures to be adopted prior to commencement of construction activities, such as submission of detailed land contamination remediation plans and adoption of best practice construction mitigation to prevent pollution.

24.12.9 Where the ‘other developments’ have not yet been approved, UK legislation and planning policy requires all developments to be suitable for their proposed use in which risks to human health and controlled waters from land contamination and risks from geohazards and damage to geodiversity sites have been appropriately managed.

24.12.10 Furthermore, it can reasonably be assumed that good and standard construction practices and actions that would be undertaken to meet existing legislative requirements under CDM Regulations (2015) and the Health and Safety at Work Act (1974) would be implemented by ‘other developments’ such that the risk of pollution incidents would be low, and that unexpected contamination found during construction of the ‘other developments’ would be managed in line with the Environment Agency guidance LCRM.

24.12.11 With the exception of the restoration of Rock Common Quarry (ID 39) and Sandgate Park Quarry (ID 42) with inert waste, none of the ‘other developments’ are likely to introduce new sources of contamination which could impact on a receptor shared with Rampion 2. In respect of the quarries, it is noted the timescale for commencement of backfilling of the quarries is after that anticipated for the completion of construction for Rampion 2. In addition, backfilling of the quarries will be using inert waste which would not be expected to generate potentially harmful landfill leachate or landfill gases and the backfilling will be carried out under an Environmental Permit issued by the Environment Agency with a requirement to implement best practice pollution prevention controls. Given that the onshore cable corridor does not pass directly through the areas in which waste would be deposited in the future and taking into account the type of waste and permitting regime, the risks of Rampion 2 acting cumulatively with these developments is considered to be negligible.

24.12.12 Consequently, even where construction and operation of ‘other developments’ overlaps with construction of Rampion 2, none of the receptors identified for assessment are likely to experience a significant effect cumulatively with the ‘other developments’ as a result of Rampion 2.

24.12.13 With respect to minerals safeguarding, two ‘other developments’ have been identified in **Table 24-25,** both of which relate to time extensions and restoration of the existing minerals sites Rock Common Quarry (ID 39) and Sandgate Park Quarry (ID 42). The potential for Rampion 2 to have an effect on these minerals sites has already been considered in the main minerals assessment which concluded that the effects on these sites were **Not Significant**. Given that Rampion 2 does not impinge on the continued operation of these sites, they are not likely to experience a significant effect cumulatively as result of Rampion 2.

24.12.14 None of the ‘other developments’ identified in **Table 24-25** are located on the soft sand mineral resource, which was the only minerals resource or minerals safeguarding area identified in the main assessment as experiencing a significant effect from Rampion 2. Consequently, none of the mineral resource or

safeguarding area receptors are likely to experience a significant effect cumulatively as a result of Rampion 2.

24.13 Transboundary effects

24.13.1 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).

24.13.2 Based on the knowledge of the baseline environment (and in particular that there are no internationally designated geological sites of importance), the nature of planned works and the wealth of evidence on the potential for impact from such projects more widely, there are not considered to be any transboundary effects on ground conditions receptors from Rampion 2.

24.14 Inter-related effects

24.14.1 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.

24.14.2 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** of the ES (Document Reference: 6.2.30).

24.14.3 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. 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).

24.15 Summary of residual effects

24.15.1 The assessment of significant impacts presented in **Section 24.9** includes consideration of any relevant embedded environmental measures that will be undertaken prior to or during the construction, operation and operation and decommissioning phases of Rampion 2 (for example land contamination ground investigation, UXO mitigation and implementation of best practice construction measures to prevent pollution).

24.15.2 Consequently the residual effects on the identified ground conditions receptors remain unchanged from those presented in **Table 24-23** (for land contamination and UXO) and **Table 24-24** for minerals safeguarding.

24.16 Glossary of terms and abbreviations

Table 24-26 Glossary of terms and abbreviations – ground conditions

Term (acronym)	Definition
Asbestos Containing Materials	Asbestos is a mineral that was frequently used as a building material in the UK between 1940 and 1999, although it was most common in materials made in the 60s, 70s and 80s. For this reason, any structure or product manufactured before the year 2000 (when the material was banned in the UK due to the risks to human health) has the potential to contain asbestos. Materials that commonly contain asbestos include: Loose asbestos in ceiling or floor cavity, Lagging, Sprayed coatings on ceilings, walls and beams/columns, Asbestos insulating board, Floor tiles, textiles and composites, Textured coatings, Asbestos cement products, Roofing felt, Rope seals and gaskets.
Authorised Landfill	Authorised Landfill sites are facilities that local authorities and industry take waste to be disposed of in the ground, and that are currently authorised by the Environment Agency under Environmental Permitting Regulations.
BEIS	Department of Business, Energy and Industrial Strategy
CDM	Construction (Design and Management)
CIRIA	Construction Industry Research and Information Association
CL:AIRE	Contaminated Land: Applications in Real Environments
Conceptual Model	A conceptual model represents the characteristics of the site in diagrammatic or written form that shows the possible relationships between contaminants, pathways and receptors.
Controlled Waters	Controlled waters as defined by Defra as follows: • Relevant territorial waters which extend seaward for three miles from the low-tide limit from which the territorial sea adjacent to England and Wales is measured: ▸ Coastal waters from the low-tide limit to the high-tide limit or fresh-water limit of a river or watercourse. ▸ Inland freshwaters. ▸ Natural and artificial lakes, ponds, reservoirs, rivers or watercourses above the fresh-water limit. • Natural and artificial underground rivers and watercourses.

Term (acronym)	Definition
	• Surface water sewers, ditches and soakaways that discharge to surface or groundwater. It also includes those that may be currently dry. • Groundwaters - any waters contained in underground strata. Controlled waters do not include any public sewer or any drain that enters into a public sewer (foul sewer).
CSM	Conceptual Site Model
DECC	Department of Energy and Climate Change
Definition of Waste Code of Practice (DoWCoP)	The DoWCoP is an industry code of practice written by the independent research group Contaminated Land: Applications in Real Environments (CL:AIRE) to support and enhance the sustainability of development projects by providing a consistent and efficient process for the reuse of excavated materials. The DoWCoP requires a Materials Management Plan (MMP) to be in place.
Defra	Department for Environment, Food and Rural Affairs
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').
EEA	European Economic Area
EOC	Explosive Ordnance Clearance
EPA	Environmental Protection Act 1990
EPP	Evidence Plan Process
Environmental Statement (ES)	The written output presenting the full findings of the Environmental Impact Assessment.
ETG	Expert Topic Group
Geodiversity	Geodiversity is defined as 'the range of rocks, minerals, fossils, soils and landforms' and is the variety of rocks, fossils, minerals, landforms, soils and natural processes, such as weathering, erosion and sedimentation, that underlie and determine the character of our natural landscape and environment.
Historical Landfill	Historical Landfill sites are former facilities that local authorities and industry took waste to be disposed of in the ground. The sites are

Term (acronym)	Definition
	now closed and there are no waste management or environmental permits in force.
Horizontal Directional Drilling (HDD)	A trenchless crossing engineering technique using a drill steered underground without the requirement for open trenches. This technique is often employed when crossing environmentally sensitive areas, major water courses and highways. This method is able to carry out the underground installation of pipes and cables with minimal surface disruption.
IAQM	Institute of Air Quality Management
LCRM	Land Contamination: Risk Management
Locally Important Geological Site (LIGS)	These are equivalent to Sites of Borough or Local Importance for Nature Conservation and accorded equivalent protection.
LPA	Local Planning Authority
Materials Management Plan (MMP)	A MMP is a mechanism by which those who are developing a site can comply with the Environment Agency regulations for excavated ground materials. A MMP can be used to show that excavated ground materials are not a waste under the Waste Management Regulations and can therefore be reused onsite in line with the Definition of Waste: Code of Practice (DoWCoP).
Minerals Safeguarding Area (MSA)	Areas of known mineral resources that are of sufficient economic or conservation value to warrant protection for future use.
Minerals Consultation Area (MCA)	A mechanism that aims to ensure that in two-tier authority areas consultation takes place between county and district planning authorities when mineral interests could be compromised by non-mineral development.
Nationally Significant Infrastructure Project (NSIP)	Nationally Significant Infrastructure Projects are major infrastructure developments in England and Wales which are consented under the Planning Act 2008. These include proposals for offshore wind farms with an installed capacity over 100MW.
NHBC	National House Building Council
ES Assessment Boundary	The ES Assessment Boundary 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

Term (acronym)	Definition
	the temporary and permanent construction and operational work areas.
PICP	Pollution Incident Control Plan
PINS	Planning Inspectorate
Preliminary Environmental Information Report (PEIR)	The written output of the Environmental Impact Assessment undertaken for the Proposed Development. It is developed to support formal consultation and presents the preliminary findings of the assessment to allow an informed view to be developed of the Proposed Development, the assessment approach that has been undertaken, and the preliminary conclusions on the likely significant effects of the Proposed Development and environmental measures proposed.
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).
PPE	Personal Protective Equipment
PPGs	Pollution Prevention Guidelines
Rampion 1	The existing Rampion Offshore Wind Farm located in the English Channel off the south coast of England.
Regionally Important Geological Site (RIGS)	The most important places for geology and geomorphology outside statutorily protected land such as Sites of Special Scientific Interest. The designation of a Regionally Important Geological Site is one way of recognising and protecting important Earth science and landscape features for future generations to enjoy. Sites are selected according to their value for: educational fieldwork scientific study, historical significance and aesthetic qualities. In

Term (acronym)	Definition
	London Regionally Important Geological Sites are sites that are considered worthy of protection for their geodiversity importance at the London-wide level.
Scoping Opinion	A Scoping Opinion is the written response to a Scoping Report for a Proposed Development from the Secretary of State of the Department of Business, Environment and Industrial Strategy for offshore wind farms. The Scoping Opinion provides guidance on the scope and level of detail of information to be provided by the Applicant in their Environmental Statement submitted as part of an application for development consent. t.
Scoping Report	A report provided to the Secretary of State by the Applicant that presents the findings of an initial stage in the Environmental Impact Assessment process. The Scoping Report should contain details on the Proposed Development with a description of environmental issues and potential impacts.
Secretary of State (SoS)	The SoS of Business, Energy and Industrial Strategy oversees the planning system and decision making with regards to development consent for offshore wind farms. This agent works within the relevant government department relating to the application.
Site of Special Scientific Interest (SSSI)	Sites designated at the national level under the Wildlife & Countryside Act 1981 (as amended). They are a series of sites that are designated to protect the best examples of significant natural habitats and populations of species.
Source	A substance that is in, on or under the land and has the potential to cause harm or to cause pollution of controlled waters.
Source-Pathway-Receptor (SPR) Linkage	The linkage of a source of contamination on or under the land which has the potential to cause harm or pollution (such as a landfill) and a receptor (something that could be adversely affected by contamination such as groundwater or people) by means of a pathway (a route by which the receptor is exposed to, or affected by, the contamination such as direct contact). A land contamination risk only exists where a source, pathway and receptor are present. Without this complete linkage, there is no risk to people or the environment even if a source of contamination is present.
SPZ	Source Protection Zone
Study Area	The ground conditions Study Area used in this ES to inform the ground conditions baseline has been taken as the wider of either: the ES Assessment Boundary comprising the area within which the Proposed Development and associated onshore infrastructure will

Term (acronym)	Definition
	be located, including the temporary and permanent construction and operational work areas; or a Zone of Influence (ZOI) 250m from the edge of the onshore cable corridor; or a ZOI 500m around the boundary of the land required for the onshore substation areas presented at ES.
The Proposed Development / Rampion 2	The onshore and offshore infrastructure associated with the offshore wind farm comprising of installed capacity of up to 1,200MW, located in the English Channel off the south coast of England.
Unexploded Ordnance (UXO)	Unexploded ordnance are explosive weapons (bombs, shells, grenades, land mines, naval mines, etc.) that did not explode when they were employed and still pose a risk of detonation, potentially many decades after they were used or discarded.
UST	Underground Storage Tank
WSCC	West Sussex County Council

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Rampion 2
WIND FARM