Lime Down
Solar Park

Environmental Statement

Volume 1, Chapter 11: Hydrology, Flood Risk and Drainage

September 2025

Revision 1

Planning Inspectorate Reference: EN010168

Document Reference: APP/6.1

APFP Regulation 5(2)(a)

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11 Hydrology, Flood Risk and Drainage

11.1 Introduction

11.1.1 This chapter of the Environmental Statement (ES) presents the findings of the Environmental Impact Assessment (EIA), focusing on an assessment of the likely significant effects on Hydrology, Flood Risk and Drainage as a result of the Scheme. For more details about the Scheme, refer to **ES Volume 1, Chapter 3: The Scheme [EN010168/APP/6.1]**.

11.1.2 This chapter identifies and proposes measures to address the potential impacts and likely significant effects on Hydrology, Flood Risk and Drainage, during the construction, operation and maintenance, and decommissioning phases of the Scheme.

11.1.3 For the purposes of this assessment, the term 'hydrology' includes risk associated with surface water and drainage, and further includes an assessment of flood risk from all sources of flooding, mainly:

- Tidal (flood risk from the sea);
- Fluvial;
- Surface Water;
- Groundwater; and
- Artificial Sources (sewers, reservoirs, and canals).

11.1.4 This chapter is supported by the following figures in **ES Volume 2 [EN010168/APP/6.2]**:

- **Figure 11-1: Lime Down A Flood Risk Map**;
- **Figure 11-2: Lime Down B Flood Risk Map**;
- **Figure 11-3: Lime Down C1 Flood Risk Map**;
- **Figure 11-4: Lime Down C2 Flood Risk Map**;
- **Figure 11-5: Lime Down D (including BESS) Flood Risk Map**;
- **Figure 11-6: Lime Down E1 Flood Risk Map**;
- **Figure 11-7: Lime Down E2 Flood Risk Map**; and
- **Figure 11-8: Lime Down Cable Route Flood Risk Map**.

11.1.5 This chapter is supported by the following appendices in **ES Volume 3 [EN010168/APP/6.3]**:

- **Appendix 11-1: Flood Risk Assessment and Drainage Strategy Covering Report**;

- **Appendix 11-2: Flood Risk Assessment and Drainage Strategy – Lime Down A**;
- **Appendix 11-3: Flood Risk Assessment and Drainage Strategy – Lime Down B**;
- **Appendix 11-4: Flood Risk Assessment and Drainage Strategy – Lime Down C1**;
- **Appendix 11-5: Flood Risk Assessment and Drainage Strategy – Lime Down C2**;
- **Appendix 11-6: Flood Risk Assessment and Drainage Strategy – Lime Down D/BESS**;
- **Appendix 11-7: Flood Risk Assessment and Drainage Strategy – Lime Down E1**;
- **Appendix 11-8: Flood Risk Assessment and Drainage Strategy – Lime Down E2**; and
- **Appendix 11-9: Flood Risk Assessment and Drainage Strategy – Cable Route Corridor**.

11.1.6 A **Water Framework Directive (WFD) Assessment [EN010168/APP/7.11]** has been undertaken. The aim of this assessment is to determine the potential for any non-compliance of the Scheme of the WFD objectives for affected water bodies, using readily available information and site observations.

11.1.7 An **Outline Water Resources Strategy [EN010168/APP/7.25]** has been undertaken. The aim of this assessment is to provide an early-stage evaluation of quantities of water required for the Scheme during construction and operation, and the likely resource for these demands.

11.2 Consultation

11.2.1 A request for an EIA Scoping Opinion was sought from the Secretary of State through the Planning Inspectorate in July 2024. The issues raised in the Scoping Opinion are summarised and responded to within **ES Volume 3, Appendix 1-2: Scoping Opinion Response Table [EN010168/APP/6.3],** which demonstrates how the matters raised in the Scoping Opinion are addressed in this ES. Matters where the scope of the assessment has been raised by the Planning Inspectorate are summarised in **Table 11-1** below.

Table 11-1: Planning Inspectorate Scoping Opinion Responses

ID	Summary of Matter	Response
3.5.1	**Hydrology, Flood Risk and Drainage: Impacts on water quality and flow regimes of receiving watercourses**	This chapter of the ES assesses the potential impacts on water quality from construction-phase surface water runoff in

ID	Summary of Matter	Response
	from increased silted/nutrient loaded surface water runoff volumes due to earthworks – construction The Scoping Report proposes to scope out impacts of increased silted/nutrient loaded surface water runoff volumes due to stripping of soil, compound preparation, soil storage and other earthworks on the water quality and flow regimes of receiving watercourses within all site areas during construction. The basis for scoping this matter out of further assessment is that runoff from work site areas would be managed using suitable sustainable drainage systems (SuDS) which would be described and secured through the CEMP. The Inspectorate does not consider enough evidence regarding the final design and control measures has been provided to scope out impacts on water quality and flow regimes of receiving watercourses during construction. In the absence of information such as evidence demonstrating clear agreement with relevant consultation bodies, the Inspectorate is not in a position to agree to scope out these matters from the assessment. Accordingly, the ES should include an assessment of these matters or the information referred to demonstrating agreement with the relevant consultation bodies and the absence of a likely significant effect.	Section 11.10 Although this was proposed to be scoped out, the Inspectorate requested further evidence which has since been incorporated. Runoff will be managed through measures set out in the **Outline Construction Environmental Management Plan (CEMP) [EN010168/APP/7.12],** which relate specifically to construction activities during the construction phase. These include measures such as silt fencing, temporary attenuation, and designated washdown areas, developed in line with Environment Agency (EA) and Construction Industry Research and Information Association (CIRIA) guidance. **ES Volume 3, Appendix 11-1: Flood Risk Assessment (FRA) and Drainage Strategy [EN010168/APP/6.3]** confirm these controls, and consultation with the EA and Wiltshire Council supports this approach. No likely significant effects are anticipated.
3.5.2	**Hydrology, Flood Risk and Drainage: Direct adverse impact on water quality due to the release of any site substances as the result of an accidental spill, leading to harm to aquatic ecology – all phases** The Scoping Report proposes to scope out impacts of increased silted/nutrient loaded surface water runoff volumes due to stripping of soil, compound preparation, soil storage and other earthworks on the water quality and flow regimes of receiving watercourses within all site areas during construction.	This chapter of the ES assesses the potential for impacts on water quality from accidental spills during all phases (Sections 11.9 and 11.10) Although this was proposed to be scoped out, the Inspectorate requested further assessment. Spill risks will be managed through design measures summarised in the **Outline CEMP [EN010168/APP/7.12]**, which relates to construction activities during the construction phase, and secured through the operational drainage design.

ID	Summary of Matter	Response
	The basis for scoping this matter out of further assessment is that runoff from work site areas would be managed using suitable sustainable drainage systems (SuDS) which would be described and secured through the CEMP. The Inspectorate does not consider enough evidence regarding the final design and control measures has been provided to scope out impacts on water quality and flow regimes of receiving watercourses during construction. In the absence of information such as evidence demonstrating clear agreement with relevant consultation bodies, the Inspectorate is not in a position to agree to scope out these matters from the assessment. Accordingly, the ES should include an assessment of these matters or the information referred to demonstrating agreement with the relevant consultation bodies and the absence of a likely significant effect.	**ES Volume 3, Appendix 11-1: Flood Risk Assessment and Drainage Strategy [EN010168/APP/6.3]** confirms that infrastructure such as substations and BESS areas include lined drainage systems, bunding, self-actuating valves, and designated refuelling and storage areas. These measures will prevent the release of contaminants to surrounding watercourses. No likely significant effects are anticipated.
3.5.3	**Hydrology, Flood Risk and Drainage: Contamination of groundwater – construction** The Scoping Report proposes to scope out contamination of groundwater if contaminants are mobilised during construction on the basis that the potential impact pathway would be removed by adoption of good practice pollution prevention techniques that would be secured by the CEMP. In the absence of information such as evidence demonstrating clear agreement with relevant consultation bodies, and further detail of potential impacts to groundwater and details of specific mitigation, the Inspectorate considers that there is insufficient evidence to agree that mobilisation of ground contamination should be scoped out at this stage. Accordingly, the ES should include an assessment of these matters or the information referred to demonstrating agreement with the	Section 11.9 of the ES assesses the potential for construction-phase impacts on groundwater quality. Although this was proposed to be scoped out, the Inspectorate requested further assessment. Risk of contaminant mobilisation will be managed through good practice pollution prevention techniques summarised in the **Outline CEMP [EN010168/APP/7.12]**, which relates to construction activities during the construction phase. **ES Volume 3, Appendix 11-1: Flood Risk Assessment and Drainage Strategy [EN010168/APP/6.3]** confirms that these techniques include use of designated refuelling areas, impermeable surfaces for storage, spill response kits, and supervision of earthworks in sensitive areas. No likely significant effects on groundwater are anticipated based on the

ID	Summary of Matter	Response
	relevant consultation bodies and the absence of a likely significant effect.	underlying geology and the embedded mitigation.
3.5.4	**Hydrology, Flood Risk and Drainage: Impacts on groundwater flow paths and levels along the cable route – operation** The Scoping Report proposes to scope out impacts on groundwater flow paths and levels along the cable route as a consequence of cable installation and presence of the cable during operation of the Scheme. This is on the basis that groundwater flows are not expected to be impacted due to the depth of the cable installation and predominance of non-aquifer superficial deposits within the Cable Route Search Corridor. The Applicant's attention is drawn to the response to consultation from the EA (Appendix 2 of this Opinion) which raises concerns about the accuracy of the Scoping Report's statement on the predominance of non-aquifer superficial deposits present within the Cable Route Search Corridor. In the absence of information such as evidence demonstrating clear agreement with relevant consultation bodies, the Inspectorate is not in a position to agree to scope these matters from the assessment. Accordingly, the ES should include an assessment of these matters or the information referred to demonstrating agreement with the relevant consultation bodies and the absence of a likely significant effect.	Section 11.10 of this chapter of the ES addresses the potential operational impacts on groundwater associated with the cable route. **ES Volume 3, Appendix 11-1: Flood Risk Assessment and Drainage Strategy [EN010168/APP/6.3]** confirms that while parts of the corridor are underlain by Secondary A aquifers, cables will be installed at shallow depths and will not intercept groundwater. Trenchless techniques such as Horizontal Directional Drilling (HDD) will be used at sensitive locations to avoid surface-level impacts. HDD is not used as a groundwater mitigation measure, and its design will be controlled to avoid groundwater strike. Use of bentonite slurry will be managed to prevent discharge to groundwater, and no permanent effects on groundwater flow are anticipated. Further assessment of hydrogeological risk, including HDD-related considerations, is provided in **ES Volume 1, Chapter 19: Ground Conditions and Contamination [EN010168/APP/6.1]**, which confirms that no likely significant effects are anticipated. Consultation with the EA has informed this approach. No permanent effects on groundwater flow are anticipated, and consultation with the EA has informed the approach.
3.5.5	**Hydrology, Flood Risk and Drainage: Impacts on water quality from surface water runoff or drainage – operation** The Scoping Report proposes to scope this matter out on the basis that surface water runoff from the BESS would be subject to treatment using suitable SuDS prior to release into the receiving water environment and runoff from the	Section 11.10 of this chapter of the ES assesses the potential impacts on water quality from operational surface water runoff. Drainage from the BESS Area will be managed using lined, permeable SuDS with pollution controls including filter media and self-actuating valves to contain spills and firewater.

ID	Summary of Matter	Response
	sites and cable corridor would be 'clean' rainfall runoff, with no detriment to its quality. Given the advice from the EA in relation to the baseline (Appendix 2 of this Opinion), the presence of a Drinking Water Groundwater Safeguard Zone within the central part of the BESS area and the limited information provided regarding mitigation to prevent surface water runoff from causing pollution, the Inspectorate considers that there is insufficient evidence to agree to scope this matter out of further assessment. Accordingly, the ES should include an assessment of these matters or information demonstrating agreement with the relevant consultation bodies and the absence of a likely significant effect. The Applicant's attention is drawn to comments from the EA regarding how firewater will be managed and contained.	Runoff from panelled areas and the cable corridor route will consist of direct rainfall falling onto clean surfaces. These areas do not contain any pollutant sources and do not require treatment. Runoff will either infiltrate or discharge at greenfield rates, as confirmed in **ES Volume 3, Appendix 11-1: Flood Risk Assessment and Drainage Strategy [EN010168/APP/6.3]**. Measures have been informed by consultation with the EA and LLFA. No likely significant effects on water quality are anticipated.
3.5.6	**Hydrology, Flood Risk and Drainage: Baseline** The Applicant's attention is drawn to advice from the EA (Appendix 2 of this Opinion) raising concerns with the description of the baseline within the Scoping Report, the PRAs for the Land at Melksham Substation and Lime Down A to E. The Applicant should ensure that the baseline presented within the ES is accurate, consistent and utilises appropriate guidance. The baseline and receptors should be agreed wherever possible with the relevant consultation bodies.	Section 11.7 of this chapter of the ES presents a revised and consistent baseline for the Site, including Lime Down A to E and the Melksham Substation (referring to the retained cable route into the existing substation). **ES Volume 3, Appendix 11-1: Flood Risk Assessment and Drainage Strategy [EN010168/APP/6.3]** and supporting appendices will ensure alignment with EA guidance. Baseline characterisation has been informed by consultation with the EA and LLFA.
3.5.7	**Hydrology, Flood Risk and Drainage: Hydraulic modelling** The Scoping Report states that the analysis of flood extents is reliant on the accuracy of the published EA Flood Map for Planning and ES flood data. It is further stated that no new hydraulic modelling will be undertaken as part of the study. The Applicant's attention is	Section 11.6 of this chapter of the ES outlines the approach to assessing flood risk, including surface water and fluvial risks. Site-specific hydraulic modelling was undertaken only for the Gauze Brook at Lime Down D, due to the extent of Flood Zone 3 and overland flow risk identified in this location. Elsewhere, the assessment relied on the Environment

ID	Summary of Matter	Response
	drawn to the EA's response to consultation (Appendix 2 of this Opinion) which states that the EA do not hold any detailed hydraulic modelling for the main rivers and ordinary watercourses which bisect the order limits for the Scheme. The response further highlights that there are ordinary watercourses that bisect the site which have no associated Flood Zones due to the small size of their respective catchments but may have associated flood risk. Furthermore, Wiltshire Council's response to consultation (Appendix 2 of this Opinion) highlights the need for detailed pluvial modelling utilising site-specific topographical surveys. The Inspectorate considers that the assessment of flood risk, including climate change, associated with these watercourses must be adequately assessed. The methodology should be agreed with the relevant consultation bodies and described within the ES.	Agency Flood Map for Planning, the latest NaFRA2 surface water flood mapping, and LiDAR-derived site-specific topographic survey data. Where no detailed EA modelled data was available for ordinary watercourses, conservative assumptions were applied based on catchment areas, topographic gradients, and proximity to flow paths. Manning's-based calculations were used in selected areas to assess indicative channel capacities and flow depths. No surface water or fluvial hydraulic modelling was undertaken outside Lime Down D. This methodology is described in **ES Volume 3, Appendix 11-1 – 11-9: Flood Risk Assessment and Drainage Strategy [EN010168/APP/6.3].** The methodology was informed by engagement with the Environment Agency and Wiltshire Council and is considered proportionate to the scale and nature of the Scheme. No likely significant effects are anticipated.
3.5.8	**Hydrology, Flood Risk and Drainage: Construction phase assessment of fluvial flooding** Paragraph 10.6.2 of the Scoping Report highlights that works may affect the hydromorphology of rivers. However, the risk of fluvial flooding and impacts to the site, along with the potential risk to third parties, during the construction phase has not been scoped in. The Inspectorate considers that the ES should provide an assessment of fluvial flood risk for the construction phase where there is potential for likely significant effects to occur or demonstrate the absence of likely significant effects with agreement from the relevant	This chapter of the ES includes an assessment of construction phase fluvial flood risk. Sections 11.6 Assessment Methodology and 11.7 Baseline Conditions and **ES Volume 3, Appendix 11-1 – 11-9: Flood Risk Assessment and Drainage Strategy [EN010168/APP/6.3]** details the baseline flood risk, the potential for temporary obstruction of flow paths, and the mitigation measures to be implemented during construction. The approach has been informed by consultation with the Environment Agency and Wiltshire Council as the Lead Local Flood Authority.

ID	Summary of Matter	Response
	consultation bodies.	
3.5.9	**Hydrology, Flood Risk and Drainage: Groundwater flood risk** The Applicant's attention is drawn to Wiltshire Council's advice (Appendix 2 of this Opinion) regarding historic groundwater flooding and the need for groundwater monitoring to establish the peak seasonal groundwater levels. The Inspectorate considers that the assessment within the ES should include groundwater flood risk. The scope of the assessment and methodology utilised should be agreed wherever possible with the relevant consultation bodies.	Groundwater flood risk has been assessed within the ES and supporting technical reports. **ES Volume 3, Appendix 11-1: Flood Risk Assessment and Drainage Strategy [EN010168/APP/6.3]** identifies areas across the Scheme boundary where the Environment Agency's mapping indicates some susceptibility to groundwater flooding. The assessment notes that the risk is generally associated with localised emergence during periods of sustained rainfall and elevated groundwater tables, particularly in lower-lying topographic areas. Further baseline information is provided in considerations, is provided in **ES Volume 1, Chapter 19: Ground Conditions [EN010168/APP/6.1],** which describes the underlying geology and hydrogeology, including the presence of Secondary A aquifers within superficial deposits in parts of the Site. The chapter also identifies historical records of groundwater flooding in the wider area. Mitigation measures to manage any potential risk have been incorporated through the **Outline Construction Environmental Management Plan [EN010168/APP/7.12],** which includes protocols for managing excavations, groundwater ingress, and dewatering where required, alongside monitoring to identify any unexpected groundwater issues during works. Given the nature of the development, the limited extent of excavations, and the proposed mitigation, the residual risk of groundwater flooding impacting the Scheme or third parties is considered low. No likely significant effects are anticipated.
3.5.10	**Hydrology, Flood Risk and Drainage: Water quality monitoring** From the information contained within the Scoping Report it is unclear if any water quality sampling/ monitoring is proposed. Given that there are waterbodies within the site boundary, the Scheme site is located within	Section 11.7 of this chapter ES describes baseline surface water and groundwater quality using available WFD and EA datasets. The Site lies within multiple WFD catchments which contain waterbodies. The potential for construction activities to affect water quality has been assessed in the ES. Measures to manage these risks

ID	Summary of Matter	Response
	multiple Water Framework Directive (WFD) catchments, and construction impacts may alter water quality, surface and ground water quality sampling should be undertaken to inform the baseline. The results should be reported in the ES. The Applicant's attention is drawn to Wiltshire Council's consultation response (Appendix 2 of this Scoping Opinion) regarding the establishment of a monitoring program, for the construction and operation of the Scheme.	will be secured through the **Outline CEMP [EN010168/APP/7.12]**, which relates to construction activities during the construction phase. Operational phase monitoring commitments will be secured through the **Outline OEMP [EN010168/APP/7.13]**, where relevant, and will be developed in consultation with the Environment Agency and Wiltshire Council. The Outline CEMP and OEMP already set out the scope, frequency, and reporting arrangements for any water quality monitoring considered necessary, proportionate to the scale and nature of the Scheme. The need for additional sampling to inform the baseline has been reviewed and is not considered necessary based on the available datasets and the nature of the Scheme. This position was discussed with the Environment Agency and Wiltshire Council at the June 2025 meeting, and both parties were comfortable with the approach.
3.5.11	**Hydrology, Flood Risk and Drainage: Hydrogeological Risk Assessment** The Applicant's attention is drawn to Wessex Water's response to consultation (Appendix 2 of this Opinion) with regard to the presence of the Great Oolite aquifer within the site boundary and the potential for impacts to this aquifer from polluting substances derived from the construction and operation of the Scheme. The Inspectorate considers that a Hydrogeological Risk Assessment should be undertaken of the potential pollution sources arising from the Scheme and the potential pathways through to the aquifer. The scope of the assessment should be agreed with the relevant consultation bodies and should consider the use of buried fluid filled cables if they form part of the proposal and potential usage of perfluoroalkyl substances (PFAS) in the components of the Scheme. Cross reference should be made to the Ground Conditions and Contamination ES Chapter.	This chapter of the ES considers the potential risks to underlying aquifers, with reference to the **ES Volume 3, Appendix 11-1 - 11-9: Flood Risk Assessment and Drainage Strategy [EN010168/APP/6.3]**. That assessment confirms that infrastructure such as BESS Area, substations, and buried cables will not result in uncontrolled discharges, with pollution control measures incorporated into the drainage design. PFAS will not be used in the components of the Scheme. A high level assessment of potential impacts of the Scheme on hydrogeological receptors has been undertaken and is presented in **ES Volume 1, Chapter 19: Ground Conditions and Contamination [EN010168/APP/6.1].** That chapter also addresses the geological sensitivity of the site, pollutant pathways, and aquifer protection measures. The scope of the assessment has been informed by consultation with the

ID	Summary of Matter	Response
		Environment Agency, Wessex Water, and Wiltshire Council.
3.5.12	**Hydrology, Flood Risk and Drainage: Climate change** Limited information has been provided within the Scoping Report regarding the impacts of climate change on flood risk. The ES and associated Flood Risk Assessment (FRA) should use the latest climate change projections available and explain how they have been applied. Efforts should be made to agree the approach with the relevant consultation bodies.	Section 11.6 of this chapter ES assesses the impact of climate change on flood risk using the latest Environment Agency guidance (*Flood Risk Assessments: Climate Change Allowances*, Environment Agency, February 2023) (Ref 11-1). **ES Volume 3, Appendix 11-1 - 11-9: Flood Risk Assessment and Drainage Strategy [EN010168/APP/6.3**] submitted with the ES applied a +45% uplift to peak rainfall intensity for surface water drainage design. This represents the upper end allowance for a "2080s" lifetime scenario for essential infrastructure in the Severn River Basin District. For fluvial flood risk, the 1% Annual Exceedance Probability (AEP) event was modelled using 35% and 70% climate change uplifts to test the design sensitivity, in line with EA guidance for the development's Flood Zone context and vulnerability classification. Drainage measures have been sized to contain the 1 in 100-year rainfall event plus 45% climate change uplift without uncontrolled runoff. The approach has been informed through consultation with the EA and Wiltshire Council as Lead Local Flood Authority, and is considered proportionate to the scale and nature of the Scheme.
3.5.13	**Hydrology, Flood Risk and Drainage: Private water supplies** The Scoping Report does not refer to private groundwater supplies. For the avoidance of doubt, any potentially impacted permitted or private water supplies should be identified and included in the assessment where there is the potential for likely significant effects to occur.	This chapter of the ES considers the potential for impacts on private water supplies, where relevant. **ES Volume 1, Chapter 19: Ground Conditions [EN010168/APP/6.1]** states that there are no licensed groundwater abstractions located within or immediately adjacent to the Site, with the exception of three located within 2000 m of Cable Link E-Rail. The closest abstraction point is approximately 896 m west of the Cable Link E-Rail.

ID	Summary of Matter	Response
		Source Protection Zones exist around these private and public groundwater abstractions. Works associated with the construction, operation and decommissioning of the Scheme have the potential to impact the quality and safety of those supplies. Measures to manage this risk will be secured through the **Outline CEMP [EN010168/APP/7.12],** the **Outline OEMP [EN010168/APP/7.13],** and **Appendix 11-1 to 11-9: Flood Risk Assessment and Drainage Strategy [EN010168/APP/6.3],** which describe pollution prevention controls, spill response procedures and drainage measures to prevent contamination of groundwater. The outcome of the review is reported in **ES Volume 1, Chapter 19: Ground Conditions [EN010168/APP/6.1**] (Section 19.7 and **Table 19-12**). This confirms that further assessment is not required. No significant effects are anticipated on private water supplies or underlying aquifers, given the separation distances from abstraction points and the embedded pollution prevention measures secured through the **Outline CEMP [EN010168/APP/7.12], Outline OEMP [EN010168/APP/7.13],** and **FRA and Drainage Strategy [EN010168/APP/6.3**].
3.5.14	**Hydrology, Flood Risk and Drainage: Water resources** The Scoping Report does not consider the consumption of water during the construction and operation phases. The ES should provide details relating to water supply and demand requirements during construction and operation (including in the context of BESS fire risk). The Inspectorate considers that water resources should be classed as a receptor in the ES where significant effects are likely to occur.	Water consumption and supply requirements during construction and operation is addressed in the **Outline Water Resources Strategy [EN010168/APP/7.25].** This includes expected construction-phase demand (e.g. welfare and dust suppression) and consideration of operational requirements, including any relevant to BESS Area fire protection systems. Water resources are considered as a potential receptor in the ES where a pathway for significant effects may exist.
3.5.15	**Hydrology, Flood Risk and Drainage: Reservoirs**	**ES Volume 3, Appendix 11-1 - 11-9: Flood Risk Assessment and Drainage**

ID	Summary of Matter	Response
	The Scoping Report does not refer to the risk of flooding from reservoirs. This should be assessed within the ES where there is potential for likely significant effects to occur.	**Strategy [EN010168/APP/6.3**] submitted with the ES reviewed EA Risk of Flooding from Reservoirs mapping and did not identify any areas of the site at risk. On this basis, the risk of flooding from reservoirs is not considered likely to result in significant effects.

11.2.2 Engagement has been undertaken with stakeholders comprising Hydrology, Flood Risk and Drainage. The matters raised are summarised in **Table 11-2** below.

Table 11-2: Summary of Engagement Undertaken

Consultee and Date	Issue/Topic	Response
Environment Agency (EA) (19.03.25)	Sequential Test	The Sequential Test is considered in **ES Volume 3, Appendix 11-1: Flood Risk Assessment and Drainage Strategy [EN010168/APP/6.3**] and fully addressed in the **Planning Statement [EN010168/APP/7.2].**
Environment Agency (EA) (19.03.25)	Watercourse Identification	All available datasets including topographic surveys and surface water mapping have been reassessed. All watercourses within the Site have been captured. Some minor ephemeral channels may be missed, but these are represented within surface water mapping.
Environment Agency (EA) (19.03.25)	NaFRA2 Mapping and Flood Risk	Updated Risk of Flooding from Surface Water (RoFSW) mapping (January 2025) has been reviewed and incorporated in the revised **ES Volume 3, Appendix 11-1: Flood Risk Assessment and Drainage Strategy [EN010168/APP/6.3]**. For unmodelled watercourses, the Environment Agency Surface Water Flood Map was used with allowances applied using Manning's equation. This methodology has been agreed as appropriate for the scale of the Scheme.
Environment Agency (EA) (19.03.25 and 29.05.25)	Flood Map for Planning (FMFP) Update	The updated EA Flood Map for Planning (March 2025) has been incorporated into the revised **ES Volume 3, Appendix 11-1: Flood Risk Assessment and Drainage Strategy [EN010168/APP/6.3]**.

Consultee and Date	Issue/Topic	Response
		In many places, flood zone extents have been reduced.
Environment Agency (EA) (19.03.25)	Flood Risk at Lime Down C Substation	The substation remains in this field but has been sequentially relocated north of the area at risk of flooding, informed by updated surface water mapping. The updated location is shown in **ES Volume 2, Figure 3-1: Indicative Site Layout Plan [EN010168/APP/6.2].**
Environment Agency (EA) (19.03.25)	Flood Risk at Gabriel's Well	The flood risk associated with Gabriel's Well through Lime Down E2 has been assessed in terms of fluvial and surface water flooding. Where panels are located within proximity to flood zones, these have been assessed accordingly.
Environment Agency (EA) (19.03.25)	Watercourse Crossing Design	Any proposed crossings will be designed so that soffit levels sit a minimum of 600 mm above the 1% AEP + climate change flood level. Open-span bridges are preferred over culverts, and abutments will be minimal and offset by at least 1 m from the bank top.
Environment Agency (EA) (19.03.25)	Floodplain Compensation	A quantitative assessment has been undertaken using cross sections and modelled flood depths. The assessment confirms that potential loss of floodplain volume is negligible and no floodplain compensation is required.
Environment Agency (EA) (19.03.25 and 29.05.25)	Manning's Flow Calculations (Cross Sections)	Cross sections used to inform Manning's open channel flow calculations are provided in **ES Volume 3, Appendix 11-1: Flood Risk Assessment and Drainage Strategy [EN010168/APP/6.3]** as requested by the EA.
Environment Agency (EA) (29.05.25)	Floodplain Storage Loss	A quantitative floodplain storage loss assessment has been undertaken and is presented in **ES Volume 3, Appendix 11-1 - 11-9: Flood Risk Assessment and Drainage Strategy [EN010168/APP/6.3].** This confirms that infrastructure, including the substation and panels, will not result in a material loss of floodplain volume.
Environment Agency (EA) (29.05.25)	Watercourse Crossing Permits	Detailed drawings and method statements for HDD and open cut crossings will be provided. Engagement regarding FRAPs and potential permit

Consultee and Date	Issue/Topic	Response
		disapplication's is ongoing. A crossing schedule has been shared with the EA.
Wiltshire Council (LLFA) (01.03.25)	WFD Assessment	A **Water Framework Directive Assessment [EN010168/APP/7.11]** has been prepared and submitted to relevant consultees including Wiltshire Council.
Wiltshire Council (LLFA) (01.03.25)	Sequential Test	The Sequential Test has been undertaken and is documented in **ES Volume 3, Appendix 11-1: Flood Risk Assessment and Drainage Strategy [EN010168/APP/6.3]** and the **Planning Statement [EN010168/APP/7.2].**
Wiltshire Council (LLFA) (01.03.25)	8 m Buffer Zones	8 m buffer zones are included around ordinary watercourses and main rivers to reduce the number of environmental permits or land drainage consents required, and to minimise the need for watercourse works or formal disapplication of permitting requirements, subject to agreement with the Environment Agency and Wiltshire Council as Lead Local Flood Authority.
Wiltshire Council (LLFA) (01.03.25)	Panel Location and Modelling	Flood modelling has been undertaken for Lime Down D, which includes areas with flood depths <1 m. Most of the site avoids the 1% AEP + Climate Change (CC) extent.
Wiltshire Council (LLFA) (01.03.25)	Soil Compaction	The **Outline CEMP [EN010168/APP/7.12]** sets out how soil compaction will be managed to avoid increasing runoff. For further details on soil compaction and remediation see **ES Volume 1, Soils and Agriculture [EN010168/APP/6.1]** and the **Outline Soil Resources Management Plan [EN010168/APP/7.15].**
Wiltshire Council (LLFA) (01.03.25)	Soil Remediation (Post and Interim)	Remediation is addressed in the **Outline CEMP [EN010168/APP/7.12].** Given the passive infiltration approach and minimal compaction, no further testing was considered necessary at this stage.
Wiltshire Council (LLFA) (01.03.25)	Permeable Tracks	Access tracks will be constructed at existing ground level using permeable materials. This approach is secured through the **Outline CEMP [EN010168/APP/7.12],** which sets out the

Consultee and Date	Issue/Topic	Response
		construction methodology and ensures the design is implemented as assessed.
Wiltshire Council (LLFA) (01.03.25)	Filter Drain Calculations	Filter drains are proposed only for small, isolated infrastructure. These are not relied upon for discharge or attenuation. Performance calculations are not required.
Wiltshire Council (LLFA) (01.03.25)	Greenfield Runoff Betterment	Runoff from formal drainage areas is restricted to 70% of the greenfield rate for all return periods, in line with Wiltshire Councils betterment policy.
Wiltshire Council (LLFA) (01.03.25)	Temporary Drainage	Temporary drainage measures are secured within the **Outline CEMP [EN010168/APP/7.12]**. Site-specific strategies are not proposed.
Wiltshire Council (LLFA) (01.03.25)	Foul Water Strategy	Effluent will be collected in sealed tanks and removed by tanker. The EA is being consulted as required.
Wiltshire Council (LLFA) (01.03.25)	Overland Flow and Drainage Consent	Existing overland flow paths will be preserved. No bunding or obstruction is proposed. The intention is to disapply the requirement for ordinary watercourse consent through the DCO, subject to agreement with the LLFA. Any works to ordinary watercourses will instead be managed through the Water Management Plan to be produced in the detailed CEMP.
Wiltshire Council (LLFA) (01.03.25)	Soakaway Testing	BRE365 soakaway testing was undertaken and failed, as anticipated due to shallow groundwater and underlying geology. As infiltration is not feasible, surface water will instead be discharged to nearby watercourses or public sewers, in accordance with the drainage hierarchy and the National Standards for SuDS.
Wiltshire Council (LLFA) (01.03.25)	Fire Suppression Flows	Attenuation systems have been sized to accommodate worst-case fire suppression flows. Shut-off valves and lined drainage are provided for the BESS Area.
Wiltshire Council (LLFA) (01.03.25)	Causeway Flow Calculations	The Additional Storage Volume has been set to 0 in all updated calculations to avoid overprediction of attenuation volumes.

Consultee and Date	Issue/Topic	Response
Wiltshire Council (LLFA) (27.05.25)	Drainage Betterment Policy Confirmation	The Applicant (Lime Down Solar Park Limited) confirmed that post-development runoff rates are restricted to 70% of equivalent greenfield rates for the 1 in 1 and 1 in 2-year events, in line with Wiltshire Councils betterment policy.
Wiltshire Council (LLFA) (27.05.25)	Filter Drain Use and Function	Filter drains are proposed only around isolated infrastructure and not relied upon for infiltration or discharge. Their function is passive interception, and performance calculations are not required.
Wiltshire Council (LLFA) (27.05.25)	Overland Flow Route Preservation	Preservation of overland flow paths is a key design principle. Tracks will be constructed at existing levels using granular permeable materials and no bunding is proposed in areas with flow paths.
Wiltshire Council (LLFA) (27.05.25)	Fire Suppression Flow Accommodation	Attenuation systems are sized to accommodate firewater runoff equivalent to a 1 in 100-year + climate change storm. Shut-off valves and lined drainage are proposed at BESS Area and substation areas.
Wiltshire Council (LLFA) (27.05.25)	Panelled Area Flood Modelling	Additional flood modelling has been undertaken for Lime Down D. Panel layout has avoided areas of predicted flood depth >1 m. This was accepted by the LLFA as proportionate.
Wiltshire Council (LLFA) (27.05.25)	Soil Remediation and Testing	The Applicant confirmed that post-construction remediation is not required due to the passive nature of the drainage design. Interim measures during construction are addressed in the **Outline CEMP [EN010168/APP/7.12]**. The LLFA supported this approach.
Wiltshire Council (LLFA) (27.05.25)	Cross-sections for Permeable Tracks	Track construction will be secured via the **Outline CEMP [EN010168/APP/7.12]**, which ensures the use of permeable materials and construction at existing ground level. Cross-sections will be provided at detailed design stage if required.
Wiltshire Council (LLFA) (27.05.25)	Causeway Calculation Parameters	The Applicant confirmed that the Additional Storage Volume has been set to 0 in all attenuation calculations to avoid overprediction.

Consultee and Date	Issue/Topic	Response
Wiltshire Council (LLFA) (27.05.25)	Temporary Drainage Strategy	Temporary drainage will be addressed within the **Outline CEMP [EN010168/APP/7.12]**. The LLFA agreed that site-specific temporary drainage strategies are not required at this stage.
Wiltshire Council (LLFA) (27.05.25)	Effluent Storage and Cesspit	Foul effluent will be stored in sealed tanks and removed off-site via tanker. Consultation with the EA is ongoing. The LLFA acknowledged that this aligns with permitting requirements.
Wiltshire Council (LLFA) (27.05.25)	Watercourse Crossings Schedule	The Applicant shared the updated crossing schedule with the LLFA in June 2025. Feedback was received in early July 2025, and final agreement is anticipated prior to DCO submission.

11.2.3 Statutory consultation was held between 29 January 2025 and 19 March 2025. A full list of consultation responses in relation to Hydrology, Flood Risk and Drainage are presented in the **Consultation Report [EN010168/APP/5.1]** submitted as part of the Application.

11.2.4 A further round of targeted consultation was undertaken between 3 June 2025 and 11 July 2025 following changes to the development boundary area of the Scheme presented in the PEIR and at Stage Two Statutory Consultation. Further detail regarding the targeted consultation is provided in **ES Volume 1, Chapter 1: Introduction [EN010168/APP/6.1]**.

11.3 Legislation, Planning Policy and Guidance

11.3.1 A summary of applicable legislation, planning policy and other guidance documents relating to Hydrology, Flood Risk and Drainage pertinent to the Scheme is provided below.

11.3.2 Full details of the legislation, policy, and guidance of relevance to the assessment of the Scheme is provided in full in **ES Volume 1, Chapter 5: Energy Need, Legislative Context and Energy Policy [EN010168/APP/6.1]**.

European Legislation

The Water Environment Framework Directive (WFD) (England and Wales) Regulations 2017 (Ref 11-2)

11.3.3 These Regulations implement the Water Framework Directive (WFD), which establishes a framework for Community action in the field of water policy. The WFD relevantly seeks to enhance the status of aquatic ecosystems, promote

sustainable water use, and contribute to mitigating the effects of flood and drought. It is a requirement of the WFD that member states classify major rivers and their tributaries in terms of their ecological status with reference to biological, chemical and hydro-morphological quality indicators.

The Groundwater Directive (2006/118/EC as amended) (Ref 11-3)

11.3.4 The Groundwater Directive (2006/118/EC as amended) is a 'Daughter Directive' to the WFD. It addresses the protection of groundwater against deterioration and pollution caused by certain dangerous substances and places an obligation on member states to prevent pollution of groundwater by substances including hydrocarbons and to control the introduction of named metals, including copper. It establishes specific measures as provided for in the WFD to prevent and control groundwater pollution. It also defines criteria for the assessment of good groundwater chemical status.

11.3.5 This Directive is given effect in England primarily through the Environmental Permitting (England and Wales) Regulations 2016 (as amended), which control discharges and inputs to groundwater and set out requirements for groundwater protection in line with the Directive's objectives.

The Flood Risk Regulations 2009 implement the EU Directive on assessment and management of flood risk [2007/60/EC] (the 'Flood Directive) (Ref 11-4)

11.3.6 The Flood Risk Regulations 2009 implement the EU Directive on the assessment and management of flood risks [2007/60/EC] (the 'Flood Directive'). The Flood Directive requires member states to develop and update a series of tools for managing all sources of flood risk, in particular:

- Preliminary Flood Risk Assessments (PFRAs);
- Flood risk and flood hazard maps;
- Flood risk management plans;
- Co-ordination of flood risk management at a strategic level;
- Improved public participation in flood risk management; and
- Coordination of flood risk management with the WFD.

The Nitrates Directive (91/676/EEC)(the 'Nitrates Directive') (Ref 11-5)

11.3.7 The Nitrates Directive (91/676/EEC) (the 'Nitrates Directive'), aims to reduce nitrate concentrations from agriculture entering water systems.

11.3.8 In England, the Directive is given effect primarily through the Nitrate Pollution Prevention Regulations 2015 (as amended), which designate Nitrate Vulnerable Zones (NVZs) and impose measures to reduce nitrate loss from agricultural land.

UK Legislation

The Land Drainage Act 1991 (Ref 11-6)

11.3.9 The Land Drainage Act 1991, places responsibility for maintaining flows in watercourses on landowners. Classified watercourses maintained by the Environment Agency are termed 'Main Rivers'. The EA has powers to control works in, over, under, on the banks of, within 7 m to 10 m of the top of the bank of the river, and of all floodplain areas through the issuing of Land Drainage Consents. The same Act also provides the basis for Ordinary Watercourse Consent, which is administered by Lead Local Flood Authorities for non-main watercourses.

The Water Resources Act 1991 (Ref 11-7)

11.3.10 The Water Resources Act 1991 requires the prior written consent of the Environment Agency (EA) for any works or structures, in, over, under or within 8 metres of any watercourse designated as a main river. The EA is responsible for permitting these types of work.

The Flood and Water Management Act 2010 (Ref 11-8)

11.3.11 The Flood and Water Management Act 2010 sets out a number of changes to the way that new developments and water infrastructure will interact, including the proposed future mechanism for using sustainable drainage systems (SuDS) where practical. The Flood and Water Management Act outlines the responsibilities for local authorities with regards to land drainage and flood risk management.

Building Regulations (2010) Part H of Schedule 1 ('Building Regulations Part H') (Ref 11-9)

11.3.12 Buildings Regulations Part H, provide guidance in terms of foul drainage, wastewater treatment systems and cesspools, rainwater drainage, building over sewers, separate systems for surface water and foul waste disposal.

11.3.13 In relation to flood risk, Buildings Regulations Part H sets out a hierarchy of where surface water should discharge. This hierarchy should be followed where practicable and is listed below.

11.3.14 Infrastructure protocol states that a designer should consider the following in order of preference before finalising a surface water design statement for the development:

- Discharge to SuDS devices, e.g. an adequate soakaway or some other infiltration system;
- Discharge to a watercourse or where this is not reasonably practicable; and
- Discharge to a public sewer network.

National Planning Policy

11.3.15 The National Policy Statements (NPSs) that are relevant to the Scheme are:

- Overarching National Policy Statement for Energy (EN-1) (November 2023) (Ref 11-10);
- National Policy Statement for Renewable Energy Infrastructure (EN-3) (November 2023) (Ref 11-11); and
- National Policy Statement for Electricity Networks Infrastructure (EN-5) (November 2023) (Ref 11-12).

11.3.16 The NPSs listed above came into effect on 17 January 2024. These NPSs set out the Government's energy policy for the delivery of nationally significant energy infrastructure, the need for new energy infrastructure, and guidance for the determination of an application for a Development Consent Order (DCO).

11.3.17 The relevant NPS requirements, together of an indication of where in the ES the information is provided to address these requirements, are provided in **ES Volume 3, Appendix 5-1: National Planning Statement Requirements [EN010168/APP/6.3]**.

National Planning Policy Framework (NPPF) (December 2024) (Ref 11-13)

11.3.18 The National Planning Policy Framework (NPPF) sets out the Government's planning policies for England and how these are expected to be applied. The National Planning Practice Guidance (NPPG) (Ref 11-14) documents are published and updated to support the NPPF. The flood risk and coastal change PPG was published in 2014 and most recently updated in August 2022.

11.3.19 The NPPF sets out the tests needed to ensure people and properties are protected from flooding. The 'sequential test' (Paragraph: 023 Reference ID: 7-023-20220825) is applied to all developments to direct developments to the areas at lowest risk of flooding in preference to those in areas at higher risk. If the sequential test shows that there are no suitable development sites in areas of lower flood risk, then the exception test is applied (Paragraph: 031 Reference ID: 7-031-20220825). The exception test must demonstrate that the development has wider benefits that outweigh flood risk, that the development will be safe for its lifetime and will not increase flood risk elsewhere. The NPSs

also require application of the sequential and exception tests in a manner consistent with the NPPF.

11.3.20 The NPPF also ensures that climate change is considered in the long term for flood risk, coastal change, water supply and changes to biodiversity and landscape. Therefore, new developments should be planned to avoid increasing vulnerability arising from the impacts of climate change; and

11.3.21 The NPPF states that a site-specific Flood Risk Assessment (FRA) is required for the following scenarios:

- All proposals involving sites of 1 hectare or greater in Flood Zone 1;
- All development in Flood Zones 2 and 3;
- All proposals involving land within Flood Zone 1, which has been identified by the EA as having critical drainage problems;
- All proposals involving land within Flood Zone 1 identified in a strategic flood assessment as being at increased flood risk in future; and
- All proposals involving land within Flood Zone 1 that may be subject to other sources of flooding, where its development would introduce a more vulnerable use.

Local Planning Policy

Wiltshire Core Strategy (WCS) (Ref 11-15)

11.3.22 The Scheme is located entirely within Wiltshire Council's administrative boundary. The current Local Plan is the Wiltshire Core Strategy (WCS), adopted in 2015. Wiltshire Council has published a draft Wiltshire Local Plan, with the Regulation 19 consultation undertaken in autumn 2023. Adoption of the revised Local Plan is now expected in 2026 (Ref 11-16).

11.3.23 Local planning policies that are relevant to the Scheme and Hydrology, Flood Risk and Drainage are:

- **Core Policy 42: Standalone Renewable Energy Installations** – Supports renewable energy proposals, including solar PV, provided there are no unacceptable environmental impacts, and the benefits outweigh any harm.
- **Core Policy 67: Flood Risk** – Requires development to be located and designed to avoid increasing flood risk elsewhere and to incorporate sustainable drainage solutions.
- **Core Policy 68: Water Resources** – Encourages the efficient use and protection of water resources, with emphasis on water quality, abstraction and groundwater protection.

- **Core Policy 69: Protection of the River Avon Special Area of Conservation (SAC)** – Aims to protect the River Avon SAC and ensure development does not contribute to phosphate loading or deterioration of the designated site.

11.3.24 As part of the emerging Local Plan, Wiltshire Council has updated their policies. The emerging Local Plan policies relevant to this Chapter are listed below:

- **Policy 86: Renewable Energy** (Formerly Core Policy 42) – Retains support for renewable energy schemes subject to assessment of cumulative landscape, visual, and ecological effects.
- **Policy 95: Flood Risk** (Formerly Core Policy 67) – Aligns with national policy and maintains a strong emphasis on avoiding inappropriate development in flood risk areas and managing runoff sustainably.
- **Policy 96: Water Resources** (Formerly Core Policy 68) – Expands on the protection of water resources, with clearer links to climate resilience and long-term water supply.
- **Policy 88: Biodiversity and Geodiversity** (Formerly Core Policy 69) – Broadens the scope to include all designated and priority habitats, with specific focus on nutrient neutrality and protection of sensitive catchments such as the River Avon SAC.

Other Guidance

Non-Statutory Technical Standards for Sustainable Drainage (2025) (Ref 11-17)

11.3.25 The National Standards for SuDS published by the Department of Environment, Food and Rural Affairs (DEFRA), set out the technical standards, which are non-statutory, to be utilised in conjunction with the NPPF and associated paragraphs (55-63) of the Flood Risk and Coastal Change section of the NPPG.

11.3.26 The CIRIA SuDS Manual C753 published by CIRIA, cover planning, design, construction and maintenance of SuDS to assist with implementing within both new and existing developments.

11.3.27 Other relevant national guidance includes:

- the Environment Agency's *Climate Change Allowances* (2022), which inform design parameters for rainfall, fluvial flows and sea level rise;
- the *Planning Inspectorate's Advice Note on the Water Framework Directive (WFD)*, which outlines the expectations for demonstrating WFD compliance in NSIPs;

- the *Design Manual for Roads and Bridges (DMRB)* (Ref: 11-25), which sets out methodologies for assessing drainage and water environment impacts where schemes interact with highways or related infrastructure; and
- *National Fire Chiefs Council Grid Scale Battery Energy Storage System Planning Guidance* (Ref: 11-29), which sets out expectations for fire safety, containment of firewater, and environmental protection for BESS Area installations. This guidance is relevant to the Scheme in terms of informing the design and assessment of drainage and pollution prevention measures associated with BESS Area compounds.

11.4 Assessment Assumptions and Limitations

11.4.1 The methodology for the Hydrology, Flood Risk and Drainage assessment and ES chapter has considered the following assumptions:

- The Scheme will be low impact with access roads and footways surfaced with permeable surfacing and therefore assumed to be effectively permeable;
- Any runoff from construction and maintenance waste materials will be collected, contained and prevented from direct entry to local watercourses. This includes runoff from areas such as laydown zones, construction compounds and fuel or chemical storage areas. These measures will be secured through the **Outline CEMP [EN010168/APP/7.12], Outline Operational Environmental Management Plan (OEMP) [EN010168/APP/7.13],** the **Outline Decommissioning Strategy (DS) [EN010168/APP/7.14]** and the **Site Waste Management Plan [EN010168/APP/7.16]**;
- All clean roof drainage from the BESS Area would be discharged directly to the nearest surface water drainage feature;

  Analysis of flood extents across the majority of the site is based on the Environment Agency Flood Map for Planning and Risk of Flooding from Surface Water (RoFSW) datasets. However, site-specific hydraulic modelling was undertaken for the Lime Down D BESS area, where Environment Agency mapping indicated the presence of Flood Zone 3 and areas at higher surface water flood risk. This approach was agreed through consultation with the Environment Agency and Wiltshire Council. No new hydraulic modelling was considered necessary for the remainder of the site, as the national datasets were deemed proportionate to the scale and nature of flood risk in those locations, in line with NPPF guidance;
- The Scheme is anticipated to be typically unmanned during the operation and maintenance phase, with infrequent attendance for routine maintenance, there will be periods of increased activity associated with the replacement of solar panels and batteries at the end of their operational life.

These activities will require specific management measures and may necessitate temporary welfare facilities during these times; however, permanent on-scheme welfare facilities will remain limited or non-existent;

- Routine maintenance checks and the periodic replacement programme would likely be the primary times when staff are present. As there will be no ongoing foul water discharge from the Scheme, and no permanent mains-connected foul water drainage systems are deemed necessary, impacts on foul sewer capacity are scoped out of further assessment; and
- Assumptions and limitations outlined above as part of the methodology are standard assumptions made in the development of such solar farm schemes and therefore, the above are not considered to have a significant impact on the validity of the assessment made in this ES Chapter.

11.5 Study Area

11.5.1 The Study Area for the Hydrology, Flood Risk and Drainage assessment comprises both the Solar PV Sites and the Cable Route Corridor (including the Highway Improvement Areas).

11.5.2 As described in **ES Volume 1, Chapter 3: The Scheme [EN010168/APP/6.1]**, 'the Site' comprises five areas (Lime Down A to E) and the Cable Route Corridor. The BESS Area is included within Lime Down D.

11.5.3 For the purposes of this assessment, Lime Down C and E have been split into four smaller sites (C1, C2, E1 and E2) due to a railway line intersecting these Solar PV sites. The interconnecting cables are considered within the Cable Route Corridor assessment, refer to **ES Volume 3, Appendix 11-9: Flood Risk Assessment and Drainage Strategy – Cable Route Corridor [EN010168/APP/6.3]**.

11.6 Assessment Methodology

11.6.1 This section sets out the scope and methodology for the assessment of the impacts of the Scheme on Hydrology, Flood Risk and Drainage.

11.6.2 The methodologies described in the following section have been developed in line with the relevant planning policy and appropriate industry guidance in Section 11.3.

11.6.3 Paragraphs 5.8.13 to 5.8.15 of National Policy Statement (NPS) for Energy 'The Overarching NPS for Energy' (EN-1) (Ref 11-10) provide the criteria whereby a site-specific FRA is required.

11.6.4 The Site is over 1ha in size and therefore requires a Flood Risk Assessment to support the DCO application in line with the criteria in EN-1 and footnote 59 of the National Planning Policy Framework (NPPF) (Ref 11-13). Surface water management is also a key consideration for the Scheme with regards to both

surface water and water quality control to appropriately manage any on or off-site impacts to flood risk and/or water quality.

Sources of Information

11.6.5 In the preparation of this chapter, the following sources of published information have been used:

- DEFRA LiDAR data service platform (Ref 11-18); and
- EA Flood Map for Planning (Updated March 2025) (Ref 11-19);
- EA Long Term Flood Risk Map (Updated January 2025) (Ref 11-20);
- EA Catchment Data Explorer (Ref 11-21);
- British Geological Survey (BGS) (Ref 11-22);
- DEFRA Magic Mapping (Ref 11-23); and
- Landl Soilscapes Mapping (Ref 11-24).

Impact Assessment Methodology

11.6.6 The following documents will support the Hydrology, Flood Risk and Drainage ES chapter:

- **ES Volume 3, Appendices 11-1 – 11-9: FRA and Drainage Strategy [EN010168/APP/6.3]** which include consideration of each Solar PV Sites and Cable Route Corridor's hydrology, assesses the potential risks of flooding to each Solar PV Site and its surroundings. It outlines measures to manage surface water, prevent increased flood risk, and ensure proper drainage through sustainable systems, including SuDS. By incorporating SuDS and understanding the Solar PV Sites' and Cable Route Corridor hydrological conditions, the strategy helps manage water runoff, protect water quality, and minimise the environmental impact on local infrastructure.
- **WFD Screening and Scoping Assessment [EN010168/APP/7.11**] which includes consideration of the Solar PV Sites' and Cable Route Corridor hydrology and water quality, assesses the potential impacts of a development on water bodies under the WFD. It will identify the risks to water quality and ecology, ensuring the Scheme complies with WFD objectives. This includes an examination of the potential construction, operation and maintenance, and decommissioning phase effects of the Scheme on relevant WFD biological, hydro-morphological and physiochemical parameters. The assessment will outline mitigation measures to protect and enhance water bodies, while managing the environmental impact on local water resources and ecosystems. The WFD

Screening and Scoping Assessment has been completed during the ES stage.

11.6.7 A desktop analysis of available data has been undertaken to inform the assessment and **ES Volume 3, Appendix 11-1: Flood Risk Assessment and Drainage Strategy [EN010168/APP/6.3**]. The assessment has identified and assessed the risks of all forms of flooding to and from the Scheme and presents:

- The potential receptors at risk of Hydrology, Flood Risk and Drainage effects arising from the Scheme;
- The likely significant Hydrology, Flood Risk and Drainage effects on relevant receptors as a result of the Scheme;
- Consultation with the Environment Agency, Lead Local Flood Authority (LLFA) and other stakeholders;
- Whether the Scheme is likely to be affected by current or future flooding from any source;
- Whether the Scheme will cause increased flood risk elsewhere;
- Whether the measures proposed to deal with these effects and risks are appropriate; and
- Completion of the Sequential Test and, if required, the Exception Test.

11.6.8 The design of SuDS will be examined for mitigating any increases in runoff within the Site. Requirements for this will be determined with consultation with the EA and Wiltshire County Council as the LLFA.

11.6.9 **ES Volume 3, Appendices 11-1 to 11-9: Flood Risk Assessment and Drainage Strategies (FRA and DS) [EN010168/APP/6.3]**, which form part of this ES, include a hydrological assessment to establish local drainage catchments and overland flow routes. The FRA and DS has been prepared in accordance with CIRIA guidance 'The SuDS Manual C753' has been undertaken and comprised:

- A site visit and hydrological/drainage surveys (BRE365 Infiltration Testing);
- A baseline hydrological assessment, data acquisition and regulatory consultation;
- Hydrological analysis (considering climate change);
- Consideration of SuDS design;
- Surface water quality risk assessment and pollution control review;
- Assessment of the implementation of SuDS;

- Consideration of maintenance requirements and responsibilities; and
- The likely significant Hydrology, Flood Risk and Drainage effects on relevant receptors as a result of the Scheme.

11.6.10 This chapter considers potential impacts to the Site and the surrounding area over the lifetime of the Scheme and sets out the appropriate embedded and additional mitigation measures required. The significance of each effect is determined by considering the sensitivity of the receptor and the magnitude of the predicted impact. Embedded mitigation is taken into account as part of the initial assessment. Where necessary, additional mitigation is then identified and applied, and any likely residual effects are described.

11.6.11 This chapter considers potential impacts to the Site and the surrounding area over the lifetime of the Scheme and sets out the appropriate embedded mitigation required. The significance of each effect is determined by considering the sensitivity of the receptor and the magnitude of the predicted impact. Mitigation measures are then applied, and any likely residual effects are identified.

11.6.12 As highlighted in the responses to the Scoping Report in relation to the assessment of flood risk and the impacts of climate change, the Scheme is anticipated to have a 60-year design life and, therefore, a 75-year timeframe should be applied, consistent with the Government's Planning Practice Guidance. Further details can be found within **ES Volume 3, Appendix 11-1: Flood Risk Assessment and Drainage Strategy [EN010168/APP/6.3]**.

11.6.13 Consultation has been undertaken with the Environment Agency and the Lead Local Flood Authority to inform the assessment of flood risk from all sources to and from the Scheme. This assessment is based on published datasets, site-specific survey data and, where appropriate, hydraulic modelling. The assessment demonstrates that flood risk will not be exacerbated by the Scheme.

11.6.14 This ES chapter summarises the findings and recommendations of **ES Volume 3, Appendices 11-1 to 11-9: Flood Risk Assessment and Drainage Strategy [EN010168/APP/6.3]**. Mitigation measures in order to minimise the potential effects of the Scheme on flood risk, water quality and drainage identified. Any residual effects have been identified as well as the potential for relevant cumulative effects associated with any other developments nearby.

11.6.15 Unless otherwise stated, the terms used to define sensitivity and magnitude in this assessment are based on the methodology outlined in the Design Manual for Roads and Bridges (DMRB) (Ref 11-25). This methodology has been adapted to inform the environmental impact assessment of hydrology, hydrogeology and flood risk. The sensitivity criteria applied in this chapter are summarised in **Table 11-3** below. Although the DMRB methodology includes a 'very high' sensitivity category, for this assessment the categories ranging from

'high' to 'negligible' are considered sufficient to cover the potential receptors. Where a receptor could reasonably fit into more than one sensitivity category, professional judgement has been used to determine the most appropriate classification.

11.6.16 Climate change has been assessed following Environment Agency guidance and NPS EN-1 (January 2024) requirements to ensure the Scheme's resilience under the credible maximum scenario for NSIPs.

11.6.17 Where Environment Agency data is available, peak river flow allowances have been applied. For un-modelled watercourses, the Environment Agency Surface Water Flood Map has been used as a proxy, with allowances applied using Manning's open channel flow equation.

11.6.18 **ES Volume 3, Appendix 11-6: FRA and Drainage Strategy - Lime Down D/BESS [EN010168/APP/6.3]** accounts for climate change, with surface water runoff rates and attenuation volumes calculated using the Environment Agency peak rainfall intensity allowances, which is 45% for the catchment. This approach ensures the Scheme is robust against potential climate change impacts.

11.6.19 As summarised in **Table 11-3**, the receptor sensitivity is defined as 'Negligible', 'Low', 'Medium' or 'High' depending on the specific receptor characteristics and its ability to tolerate change. Magnitude is considered in relation to the potential impact on the receptor. Magnitude is defined in a range from 'Neutral' to 'High' (**Table 11-4**). The significance of the effect is defined in relation to both the magnitude of the impact and receptor significance (**Table 11-5**).

11.6.20 If the significance of the potential effect is 'Moderate Adverse' or higher, the effect is considered significant. Where not already addressed through embedded mitigation, additional mitigation measures may be identified to reduce the significance of the effect. If the significance of the potential effect is 'Moderate/Minor Adverse', professional judgement is used to determine whether the effect is significant.

Table 11-3: Sensitivity of the Identified Environmental Receptor

Sensitivity	Definition
High	WFD Classification – Good or High. Site protected under EU or UK wildlife legislation (SAC, Special Protection Area (SPA), Site of Special Scientific Interest (SSSI), Ramsar site). European Designated salmonid fishery (or salmonid and cyprinid fishery). Important social or economic uses such as water supply, navigation or mineral extraction. Floodplain or defence protecting 1 or more residential properties or industrial premises from flooding.
Medium	WFD Classification: Moderate.

Sensitivity	Definition
	May be designated as a local wildlife site. May support a small/limited population of protected species. Limited social or economic uses. Floodplain or defence protecting 10 or fewer industrial properties from flooding.
Low	WFD classification – Poor. No nature conservation designations. Low aquatic fauna and flora biodiversity and no protected species. Minimal economic or social uses. Floodplain with limited constraints and a low probability of flooding of residential and industrial properties.
Negligible	WFD classification – Poor or unclassified. No statutory or non-statutory nature conservation designations. Very limited or absent biodiversity interest; no protected or notable species present. No identifiable economic or social use. Floodplain with very limited constraints and a very low or negligible probability of flooding.

Table 11-4:Methodology for Determining Impact Magnitude

Sensitivity	Definition
High	Loss of Protected Area. Pollution of potable sources of water abstraction. Deterioration of a water body leading to a failure to meet Good Ecological Status (GES) under the WFD and reduction in Class (or prevents the successful implementation of mitigation measures for heavily modified or artificial water bodies). Significant potential increase in peak flood level (1% annual probability).
Medium	Loss in production of fishery. Discharge of a polluting substance to a watercourse but insufficient to change its water quality status (WFD class) in the long term. No reduction in WFD class, but effect may prevent improvement (if not already at GES) or the successful implementation of mitigation measures for heavily modified or artificial water bodies. Moderate potential Increase in peak flood level (1% annual probability).
Low	Noticeable effect on features, or key attributes of features, on the Protected Areas Register. Measurable changes in attribute but of limited size and/or proportion, which does not lead to a reduction in WFD status or failure to improve. Minor potential increase in peak flood level (1% annual probability).
Negligible	No effect on features, or key attributes of features, on the Protected Areas Register. Discharges to watercourse but no significant loss in quality, fishery productivity or biodiversity.

Sensitivity	Definition
	No effect on WFD classification or water body target. Negligible change in peak flood level (1% annual probability).

Table 11-5:Methodology for Determining Significant Effects

	Sensitivity / Magnitude	High	Medium	Low	Negligible
Adverse Magnitude	**High**	**Major**	**Major/ Moderate**	**Moderate**	Moderate/ Minor
	Medium	**Major/ Moderate**	**Moderate**	Moderate/ Minor	Minor
	Low	**Moderate**	Moderate/ Minor	Minor	Negligible
	Negligible	Moderate/Minor	Minor	Negligible	Negligible

11.6.21 In considering the significance of the effect, account is taken of its duration, reversibility, and compatibility with relevant environmental policies and standards. Effects can be temporary or permanent. Temporary effects are largely associated with the construction and decommissioning phases and long-term effects are largely associated with the operation and maintenance phase.

11.6.22 For the purposes of this ES chapter, effects of moderate or major adverse significance are considered significant in EIA terms. Where such effects are identified, additional mitigation measures will be considered and incorporated where practicable to reduce the residual significance. Effects of minor or negligible significance are not considered significant for EIA purposes.

11.7 Baseline Conditions

11.7.1 This section describes the existing and anticipated future baseline conditions for the Scheme and surrounding area with specific reference to Hydrology, Flood Risk and Drainage.

11.7.2 Following statutory consultation, feedback was received (**Table 11-2**). To address the responses, **ES Volume 3, Appendices 11-1 to 11-9: FRA and Drainage Strategy [EN010168/APP/6.3]** and this chapter have been updated to reflect the finalised methodology and findings.

11.7.3 The risk of fluvial flooding has been interpreted from the EA online Flood Map for Planning (Ref 11-19), updated in March 2025. The risk of surface water flooding has been assessed from the EA Long Term Flood Risk Map (Surface Water) (Ref 11-20), updated in January 2025.

11.7.4 The Scheme is situated within Severn River Basin Management Plan (RBMP) area. Within the Severn RBMP, the Site is situated within the Avon Bristol and North Somerset Streams Management Catchment. The upper allowance for peak river flow in the 2080s is 71%. The 2080's epoch has been chosen from the EA's Climate Change Allowance Guidance (Ref 11-16) as it is the closest aligning epoch to the design life (60 years) of the Scheme.

11.7.5 Across the Solar PV Sites, the land is primarily in arable use, with some areas of grassland in Lime Down B, C and E.

Existing Baseline

11.7.6 The existing baseline conditions for fluvial and surface water flooding are detailed for each element of the Scheme below. Full details are provided in **ES Volume 3, Appendices 11-1 to 11-9: FRA and Drainage Strategy [EN010168/APP/6.3].**

11.7.7 Baseline groundwater levels, including seasonal variation, are described in **ES Volume 1, Chapter 19: Ground Conditions [EN010168/APP/6.1]**, with groundwater flood risk considered in in **ES Volume 3, Appendices 11-1 to 11-9: FRA and Drainage Strategy [EN010168/APP/6.3]** where relevant.

Lime Down A

Fluvial Flood Risk

11.7.8 The EA's updated Flood Map for Planning (Ref 11-19) indicates that Lime Down A is located wholly in Flood Zone 1 (<0.1% AEP from flooding from rivers or the sea).

11.7.9 There are two unnamed land drainage ditches that are adjacent to the southern boundary and the River Avon is situated approximately 240 m north of the Lime Down A boundary. The two unnamed land drainage ditches flow in a southernly direction and the River Avon flows in a northeasterly direction towards Malmesbury before flowing southernly.

11.7.10 The EA 'Historical Flood Map' (Ref 11-26) indicates that there have been no incidents of flooding at Lime Down A.

11.7.11 Lime Down A is considered to be at Low risk of fluvial flooding

Surface Water Flood Risk

11.7.12 The previous EA RoFSW Map indicates that the majority of Lime Down A is at Very Low risk of surface water flooding, meaning it has a <0.1% annual probability of flooding.

11.7.13 There are areas of Low to High risk in different fields within Lime Down A and surface water flooding extents largely match the courses of the unnamed drains which flow adjacent to the southern boundary.

11.7.14 Depths are predicted to remain below 300 mm during all scenarios across the majority of Lime Down A, with some very small, isolated areas in Fields A1 and A12 expected to reach depths between 300 – 600 mm. Depths of below 0.3 m are considered passible by vehicles and people, therefore Lime Down A is deemed passible.

11.7.15 The updated NaFRA Map (Ref 11-20) indicates that there is no visible change in risks from surface water posed to Lime Down B.

11.7.16 Based on the above, the overall risk of surface water flooding at Lime Down A is considered to be Low.

Lime Down B

Fluvial Flood Risk

11.7.17 The EA's updated Flood Map for Planning (Ref 11-19) indicates that Lime Down B is located wholly in Flood Zone 1 (<0.1% AEP from flooding from rivers or the sea).

11.7.18 The Gauze Brook channel is located approximately 50 m south of Lime Down B at its closest point. Additionally, a network of land drainage ditches is present both on-Site and in the immediate vicinity (approximately within 200 m of the boundary) of Lime Down B. A land drainage ditch flows northeast between Fields B8 and B9.

11.7.19 Lime Down B is therefore considered to be at Low risk of fluvial flooding.

Surface Water Flood Risk

11.7.20 The previous EA RoFSW Map shows that most of Lime Down B is at Very Low risk of surface water flooding (<0.1% annual probability). However, isolated areas of Low to High risk exist in specific fields, largely following the topographical depressions of unnamed land drainage ditches onsite.

11.7.21 The updated NaFRA Map (Ref 11-20) indicates that the majority of Lime Down B is at Very Low risk of surface water flooding, meaning it has a <0.1% annual probability of flooding. However, there are areas of Low (between 1% and 0.1% AEP) to High risk (> 3.3% AEP) across the Fields B8 and B9.

11.7.22 Depths are predicted to remain below 300 mm during all scenarios across the majority of Lime Down B. Depths of below 300 mm are considered passible by vehicles and people, therefore Lime Down B is deemed passible. Depths are not shown to exceed 600 mm anywhere within the site.

11.7.23 Based on the above and considering the embedded mitigation as part of the design of the solar panels the overall risk of surface water flooding at Lime Down B is considered to be Low.

Lime Down C1

Fluvial Flood Risk

11.7.24 The EA's updated Flood Map for Planning (Ref 11-19) indicates that Lime Down C1 is located wholly in Flood Zone 1 (meaning it is an area considered to have <0.1% annual probability of flooding from rivers or the sea), with the exception of Field C22 of which the north-easternmost extent is within Flood Zone 2/3.

11.7.25 The nearest watercourses consist of a network of unnamed drains both on Lime Down C1 and within a 200 m vicinity of the boundary, flowing in a northeasterly direction.

11.7.26 Lime Down C1 is therefore considered to be at Low risk of fluvial flooding.

Surface Water Flood Risk

11.7.27 The previous EA RoFSW Map shows that Lime Down C1 is primarily at Very Low risk of surface water flooding, with an annual probability of less than 0.1%, according to the Environment Agency's 'Flood Risk from Surface Water' map. However, there are varying risk levels across different fields, ranging from Low (0.1% to 1% AEP) to High (greater than 3.3% AEP) in different fields within Lime Down C1, particularly at Fields C6 – C7, across the northern boundaries of Fields C19 and C21, and across Fields C23 and C32 – C36.

11.7.28 With reference to the depth mapping provided by the NaFRA data, flood depths are anticipated to be Low, with depths remaining largely below 300 mm which is considered passable to people and vehicles. Some depths between 300 and 600 mm are anticipated in some of the Fields referenced above, however these are largely isolated areas and can be associated with the existing land drainage ditches. Depths are not shown to exceed 600 mm anywhere within Lime Down C1.

11.7.29 The extents of surface water flooding largely follow the courses of the unnamed drains located in the immediate vicinity of Lime Down C1.

11.7.30 The updated NaFRA Map (Ref 11-20) indicates that there is no visible change in risks from surface water posed to Lime Down C1.

11.7.31 Lime Down C1 is assessed to be at Low risk of fluvial flooding.

Lime Down C2

Fluvial Flood Risk

11.7.32 The EA's updated Flood Map for Planning (Ref 11-19) indicates that Lime Down C2 is located wholly within Flood Zone 1, indicating a less than 0.1% annual probability of flooding from rivers or the sea, with the nearest main river, Gauze Brook, situated approximately 800 m to the south of Lime Down C2 boundary, posing no risk.

11.7.33 Lime Down C2 contains unnamed drains that could potentially lead to fluvial flooding if they overflow during extreme rainfall.

11.7.34 There are no historical flooding records within Lime Down C2 and, overall, it is considered to be at Low risk of fluvial flooding.

Surface Water Flood Risk

11.7.35 The previous EA RoFSW Map indicates that most of Lime Down C2 is at Very Low risk of surface water flooding, with an annual probability of less than 0.1%.

11.7.36 However, some areas exhibit varying risk levels, from Low (0.1% to 1% AEP) to High (greater than 3.3% AEP), primarily along topographical depressions associated with land drainage ditches. During high-risk scenarios, expected depths remain below 300 mm, while isolated areas may reach depths of up to 600 mm.

11.7.37 Across all risk scenarios, the expected depths on-site are generally deemed passable.

11.7.38 The updated NaFRA Map (Ref 11-20) indicates that there is no visible change in risks from surface water posed to Lime Down C2.

11.7.39 The overall risk of surface water flooding within Lime Down C2 is considered Low.

Lime Down D

Fluvial Flood Risk

11.7.40 The EA's updated Flood Map for Planning (Ref 11-19) indicates that Lime Down D is predominately located in Flood Zone 1, indicating an area with less than a 0.1% annual probability of flooding from rivers or the sea. However, Fields D9 – D14, D16 – D17 have significant areas within Flood Zones 2/3. Furthermore, the area bisecting Fields D19 – D22 is also located within Flood Zone 3, however this is considered to be associated with a small watercourse and does not encroach into Lime Down D or into the area allocated for the Scheme.

11.7.41 Hydraulic modelling has been undertaken, focusing on Gauze Brook and the existing Flood Zone 3 area in the lower-lying eastern section of Lime Down D, to provide depths and climate change information. This modelling has been incorporated in the revised **ES Volume 3, Appendix 11-6 Flood Risk Assessment and Drainage Strategy - Lime Down D/BESS [EN010168/APP/6.3]** and presented in this chapter.

11.7.42 The proposed BESS Area in field D1 is located wholly within Flood Zone 1 areas and is therefore at Low risk. Both proposed substations within Lime Down D (fields D18 and 22) are also located entirely within Flood Zone 1, in areas shown to lie outside the extent of the 1 in 1,000-year fluvial floodplain, and are therefore also considered to be at Low risk of fluvial flooding.

11.7.43 Lime Down D is located partially within an area where flooding is at a Low to Moderate risk, however, Lime Down D is considered to be at Low risk of fluvial

flooding overall. Hydraulic Modelling has been undertaken to ensure the risk remains Low as a result of climate change.

Surface Water Flood Risk

11.7.44 The previous EA RoFSW Map indicates that the majority of Lime Down D is at Very Low risk of surface water flooding, meaning it has a <0.1% annual probability of flooding.

11.7.45 There are areas of Low to High risk within Fields D11 – D14, which is considered to be associated with the presence of Gauze Brook. Other areas of risk across Lime Down D are associated with isolated topographic depressions within the Fields.

11.7.46 With reference to the depth mapping provided by the NaFRA data, flood depths are anticipated to be Low, with depths remaining largely below 300 mm which is considered passable to people and vehicles. Some depths between 300 and 600 mm are anticipated in Fields D5 and D12 – D14, however these are small and largely isolated areas and can be associated with the existing land drainage ditches and isolated topographic depressions.

11.7.47 The updated NaFRA Map (Ref 11-20) indicates that there is no visible change in risks from surface water posed to Lime Down D.

11.7.48 Based on the above, the overall risk of surface water flooding at Lime Down D is considered to be Low.

Lime Down E1

Fluvial Flood Risk

11.7.49 The EA's updated Flood Map for Planning (Ref 11-19) indicates that Lime Down E1 is predominantly located within Flood Zone 1 with the exception of the northernmost extent of Field E4 which is located in Flood Zone 2. The extent of Flood Zone 2 is considered to be associated with a tributary of Gauze Brook (which flows in a north-easterly direction) and does not encroach into the Order Limits.

11.7.50 Therefore, Lime Down E1 is considered to be at Low risk of fluvial flooding.

Surface Water Flood Risk

11.7.51 The previous EA RoFSW Map indicates that the majority of Lime Down E1 is at Very Low risk of surface water flooding, meaning it has a <0.1% annual probability of flooding.

11.7.52 There are some small areas of Very Low to High risk (0.1 - >3.3% annual chance of flooding), particularly at Fields E1 – E4 and a small section in the southernmost extent of Field E6. The areas of risk in Fields E2 – E4 are associated with the presence of the tributary of Gauze Brook which flows in a north-easterly direction.

11.7.53 With reference to the depth mapping provided by the NaFRA data, flood depths are anticipated to be Low, with depths remaining largely below 300 mm which is considered passable to people and vehicles. Some depths between 300 and 600 mm are anticipated in Fields E1 and E6 however these are small areas associated with topographic low points, and do not form flow routes within the Site.

11.7.54 The updated NaFRA Map (Ref 11-20) indicates that there is no visible change in risks from surface water posed to Lime Down E1.

11.7.55 Based on the above, the overall risk of surface water flooding at Lime Down E1 is considered to be Low.

Lime Down E2

Fluvial Flood Risk

11.7.56 The EA's updated Flood Map for Planning (Ref 11-19) indicates that Lime Down E2 is predominantly located in Flood Zone 1, indicating an area with less than a 0.1% annual probability of flooding from rivers or the sea, with the exception of Fields E20 – E27 which are located in Flood Zones 2 and 3.

11.7.57 These areas are located in the immediate extents of Gabriel's Well River which is a Main River located through the centre of Lime Down E2 and flows northwards.

11.7.58 Overall, Lime Down E2 is considered to be at Low risk of fluvial flooding.

Surface Water Flood Risk

11.7.59 The previous EA RoFSW Map indicates that the majority of Lime Down E2 is at Very Low risk of surface water flooding, meaning it has a <0.1% annual probability of flooding.

11.7.60 There are areas of Low to High risk within small areas of Lime Down E2, particularly in areas associated with the presence of Gabriel's Well which flows in a north-easterly direction.

11.7.61 With reference to the depth mapping provided by the NaFRA data, flood depths are anticipated to be Low, with depths remaining largely below 300 mm which is considered passable to people and vehicles. Some depths between 300 and 600 mm are anticipated in Fields E10 – E12, E14 – E18, E22, E25 – E26, and E33 – E34, however as above, these depths are associated with the presence of Gabriel's Well.

11.7.62 The updated NaFRA Map (Ref 11-20) indicates that there is no visible change in risks from surface water posed to Lime Down E2.

11.7.63 Based on the above, the overall risk of surface water flooding at Lime Down E2 is considered to be Low.

Cable Route Corridor

Fluvial Flood Risk

11.7.64 The EA's updated Flood Map for Planning (Ref 11-19) indicates that the vast majority of the Cable Route Corridor is located within Flood Zone 1 (<0.1% Annual Exceedance Probability (AEP)) for river flooding (see **ES Volume 2, Figure 11-8: Lime Down Cable Route Flood Risk Map [EN010168/APP/6.2]**). However, Flood Zone 2 (0.1% to 1% AEP) and Flood Zone 3 (>1% AEP) for fluvial flooding are present in the far south of the Cable Route Corridor and along the various tributaries associated with the River Avon.

11.7.65 The Cable Route Corridor passes through or comes in close proximity to many watercourses. The crossing of watercourses will be implemented by HDD in some locations which will allow the Cable Route to be constructed underneath the watercourses without impacting the watercourse or increasing flood risk. Other crossings will be in the form of open trench crossings.

11.7.66 As the Cable Route Corridor is for the installation of a below ground cable, it is inherently resilient to above ground flooding.

11.7.67 Overall, the Cable Route Corridor is considered to be at Low risk of fluvial flooding.

Surface Water Flood Risk

11.7.68 The previous EA RoFSW mapping indicates the majority of the Cable Route Corridor is at Very Low risk of surface water flooding (<0.1% annual probability of flooding). Surface water flooding with a Low to High risk (0.1% to >3.3% AEP) of occurrence concur within the courses of the watercourses.

11.7.69 The updated NaFRA mapping (Ref 11-20) has been assessed and indicates there is no visible change in surface water risk across the Cable Route Corridor.

11.7.70 Based on the above, the overall risk of surface water flooding at the Cable Route Corridor is considered to be Very Low.

Highway Improvement Areas

11.7.71 Minor highway improvement areas, such as access widening and surface enhancements, are proposed as part of the Scheme. From a flood risk perspective, these works are considered minimal and are therefore not assessed further within this report.

Future Baseline

11.7.72 This section considers those changes to the baseline conditions, as described above, that might occur in the absence of the Scheme and during the time period over which the Scheme would be in place. The future baseline scenarios

are set out in **ES Volume 1, Chapter 6: Environmental Impact Assessment Methodology [EN010168/APP/6.1]**.

11.7.73 In the absence of the Scheme, the majority of baseline conditions for Hydrology, Flood Risk and Drainage are unlikely to change significantly. However, the potential increase in flood risk due to climate change, particularly in relation to increased rainfall, is assessed throughout **Volume 3, Appendices 11-1 – 11-9: FRA and Drainage Strategy [EN010168/APP/6.3]** and respective hydraulic modelling. This includes potential impacts of flood risks from all sources including surface water and fluvial flood risks, which are expected to evolve over time.

11.8 Potential Impacts

11.8.1 Embedded mitigation measures being incorporated into the design and construction of the proposed Scheme are set out in Section 11.9 below. Prior to the implementation of any mitigation (embedded or additional), the proposed Scheme has the potential to affect Hydrology, Flood Risk and Drainage (positively or negatively), during construction, operation and decommissioning, as set out in **Table 11-6** and **Table 11-7**.

Table 11-6:Summary of Potential Flood Risk Impacts

Potential Impact	Receptor(s)
Construction/Decommissioning Phase	
Mud and Debris Blockages	Flood risk to future people or property at the Solar PV Site, Cable Route Corridor and surrounding areas. Construction workers and construction equipment.
Temporary Increase in Impermeable Area	Flood risk to future people or property at the Solar PV Site, Cable Route Corridor and surrounding areas. Construction workers and construction equipment.
Compaction of Soils	Flood risk to future people or property at the Solar PV Site, Cable Route Corridor and surrounding areas. Construction workers and construction equipment.
Operation and Maintenance Phase	
Increase in Permanent Impermeable Area	Flood risk to future people or property at the Solar PV Site and surrounding areas.
Increase in Discharge to Local Watercourses	Flood risk to future people or property at the Solar PV Site and surrounding areas.
Blockage of Drainage Networks	Flood risk to future people or property at the Solar PV Site and surrounding areas.

Table 11-7:Summary of Potential Water Resources Impacts

Potential Impact	Receptor(s)
Construction/Decommissioning Phase	
Silt-laden Runoff	Local watercourses including those within and adjacent to the Solar PV Site and Cable Route Corridor, groundwater bodies.
Spillages, Leakages and Pollutants	Local watercourses including those within and adjacent to the Solar PV Site and Cable Route Corridor, groundwater bodies.
Increase in Highway Routine Runoff	Local watercourses including those within and adjacent to the Solar PV Site, groundwater bodies.
Increased Demand on Water Supply	Surrounding area.
Inappropriate Wastewater Disposal from Welfare Facilities	Local watercourses including those within and adjacent to the Solar PV Site and Cable Route Corridor, groundwater bodies.
HDD and Drilling Fluid Breakout Risk	Local watercourses including those within and adjacent to the Solar PV Site, groundwater bodies.
Operation and Maintenance Phase	
Diffuse Pollution Contained in Urban Runoff	Local watercourses including those within and adjacent to the Solar PV Site, groundwater bodies.
Diffuse Pollution Resulting from Fire	Local watercourses including those within and adjacent to the Solar PV Site, groundwater bodies.
Increase in Highway Routine Runoff	Local watercourses including those within and adjacent to the Solar PV Site, groundwater bodies.
Increased Demand on Water Supply	Surrounding area.
Disposal of Surface and Foul Water from the Solar PV Site	Local watercourses including those within and adjacent to the Solar PV Site, groundwater bodies.
Equipment Replacement During Operation	Local watercourses including those within and adjacent to the Solar PV Site and Cable Route Corridor, groundwater bodies.

11.8.2 **Table 11-6** and **Table 11-7 c**aptures all potential impacts on the water environment scoped into the assessment under the Scoping Opinion, including potential groundwater contamination, impacts on private water supplies, and water consumption during construction and operation. Groundwater quality and flood risk are assessed in detail in this chapter and its appendices. Potential contamination risks associated with construction activities, including land disturbance and infrastructure installation, are addressed in **ES Volume 1, Chapter 19: Ground Conditions [EN010168/APP/6.1],** which includes reference to baseline groundwater levels, historic land use, and relevant pollution prevention measures.

11.9 Embedded Mitigation

11.9.1 The Scheme has been designed, as far as practicable, to avoid and reduce impacts and effects on Hydrology, Flood Risk and Drainage through the process of embedding mitigation measures into the design. In addition, how the Scheme is constructed, operated and maintained, and decommissioned would be controlled in order to manage and minimise potential environmental effects (required as a result of legislative requirements and/or standard sectoral practices).

11.9.2 The following embedded mitigation measures have been incorporated into the Scheme design, with detailed proposals and locations provided in **ES Volume 1, Chapter 3: The Scheme [EN010168/APP/6.1]**. Accompanying management plans, including the **Outline CEMP [EN010168/APP/7.12]** and **Outline OEMP [EN010168/APP/7.13]**, will be secured by DCO requirement. It should be noted that any site-specific mitigation required has been outlined in the respective site-specific Flood Risk Assessment and Drainage Strategies in the supporting appendices:

Flood Risk and Resilience

- Associated electrical infrastructure, including substations and other larger fixed components (refer to **ES Volume 1, Chapter 3: The Scheme [EN010168/APP/6.1]**), has been sequentially located in areas with a 'Low' probability of flooding (less than 1 in 1,000 annual probability of river or sea flooding (<0.1%)), where practicable, based on site-specific flood modelling and topographic data;
- Smaller fixed infrastructure such as Conversion Units are required to be positioned at specific operational locations within the panelled areas and therefore offer limited flexibility in siting. These components are typically located outside the 1 in 100 plus climate change extent (1% annual probability +CC), but where they fall within areas of modelled risk, they will be protected through localised flood resilience measures. Their location and risk context are addressed in the site-specific assessments provided in **ES Volume 3, Appendices 11.2 to 11.9: FRA and Drainage Strategies [EN010168/APP/6.3]**;
- Less-flood sensitive infrastructure forming the wider Scheme (Solar PV Panels and cabling) have been sequentially located outside the 1 in 100 plus climate change annual probability extent (1% +CC) or where this is not practicable restricted to areas which experience less than 1 m depth of flooding during the same event;
- Flexibility for tracker or fixed Solar PV Panels has been built into the design with foundations likely to be galvanised steel poles driven into the ground. These will either be piles rammed directly into the ground or rammed into a

pre-drilled hole, or a pillar attaching to a steel ground screw depending on ground conditions;

- For both fixed and tracker panels, all sensitive and electrical equipment mounted on the Solar PV Panels will be elevated by the supporting legs or frame so that it is no less than 0.6 metres above the surrounding peak flood level, in accordance with the site-specific hydraulic modelling and flood resilience principles.
- Tracker panel units will be mounted on rotating frames which, when at maximum tilt, result in a minimum clearance of approximately 0.4 metres between the lower edge of the panel and surrounding ground levels. However, the electrical and sensitive components will remain positioned at a height that ensures compliance with the 0.6 metre clearance above the peak flood level. During flood events, the tracking system is designed to stow panels into a horizontal position, resulting in a post height of at least 2.5 metres above ground level. The panel structures themselves are flood resilient and not considered vulnerable to short-term water contact.
- Runoff from equipment and access tracks will be directed to permeable SuDS features such as gravel-filled trenches or French drains, or similar passive drainage features appropriate to local condition.

Drainage and Surface Water Management

- Eight metre buffers from infrastructure will be established around watercourses, including Main Rivers and Ordinary Watercourses. This is an improvement over the baseline scenario, where arable farming typically involves ploughing closer to ditches than the proposed separations, resulting in better drainage outcomes;
- Linear infiltration trenches will be incorporated around isolated infrastructure (e.g. convserion or cable jointing pillars) within panelled areas to manage surface water at source, mimic the undeveloped state, and prevent lateral surface water migration;
- Where practicable, runoff from equipment and access tracks will be directed to permeable SuDS features such as gravel-filled trenches or French drains, or similar passive drainage features appropriate to local conditions;
- The construction of the cable route will include several watercourse crossings which are described within **ES Volume 3, Appendix 11-9: Flood Risk Assessment and Drainage Strategy - Lime Down Cable Route Corridor [EN010168/APP/6.3]**. While works would ordinarily require Flood Risk Activity Permits from the Environment Agency and Land Drainage Consents from the Lead Local Flood Authority, it is intended that these requirements be disapplied through the Development Consent Order. Protective provisions have been included in the **Draft DCO**

[EN010168/APP/3.1] to ensure that both the EA and LLFA retain oversight and control over the proposed works where relevant;

- Access to the Scheme during construction, operation and maintenance, and decommissioning phases will be taken from new permeable or existing farm tracks accessed from the local highway network. This limits the potential for increased surface water runoff rates and sedimentation effects during construction/decommissioning; and
- Where practicable, existing access tracks would be retained to limit the requirement to develop new access which can disturb soils and lead to compaction. Where new access tracks are required, they would be designed to avoid crossing drainage ditches, where practicable. Appropriate soil handling and storage protocols are set out in the **Outline Soil Resources Management Plan [EN010168/APP/7.15]**.

Water Quality and Pollution Control

- The **Outline CEMP [EN010168/APP/7.12]** accompanying the DCO application, describes water management measures to control surface water run-off and drain hardstanding and other structures during the construction, operation and decommissioning of the Scheme;
- In addition, a Water Management Plan (which will form part of a detailed CEMP) will include details of pre-construction, construction, and post-construction water quality monitoring. This will be based on a combination of visual observations and reviews of the Environment Agency's automatic water quality monitoring network;
- Where trenchless crossing techniques such as HDD are used, appropriate environmental controls will be implemented to manage the risk of drilling fluid escape. This includes procedures to detect and respond to potential breakouts. These measures will be secured through the detailed CEMP, based on the commitments set out in the **Outline CEMP [EN010168/APP/7.12]**;
- All service cabling should be designed and installed to be flood resilient/water compatible. This should be achieved in accordance with appropriate design standards and good practice guidance; and
- Beyond this, construction/decommissioning groundworks would be kept as far from the from watercourses/drainage ditches as reasonably practicable.

Baseline Improvement Measures

- It is noted that, currently, the fields within the Site are typically used for arable farming. Aside from the use of fertiliser in tree pits at the initial tree planting stage, the Scheme does not require the application of fertilisers (including nitrates) to the land and, therefore, reduces the risk of

watercourse pollution in proximity to the Site compared to the current agricultural uses;

- The Solar PV Panels have the potential to concentrate rainfall under the leeward edge of the panels themselves. Research in the United States by Cook and McCuen (Ref 11-27) suggested this increase would not be significant however, there is a potential increase in silt-laden runoff. With the implementation of suitable planting (such as a wildflower or grass mix) the underlying ground cover is strengthened and is unlikely to generate surface water runoff rates beyond the baseline scenario. This is detailed in the **Outline Landscape and Ecological Management Plan (LEMP); [EN010168/APP/7.18]**;
- All embedded mitigation measures set out above will be secured by DCO requirement, including through the **Outline CEMP [EN010168/APP/7.12]**, the **Outline LEMP [EN010168/APP/7.18],** the **Outline Operational OEMP [EN010168/APP/7.13]**, the **Outline Decommissioning Strategy (DS) [EN010168/APP/7.14]**, the **Outline Soil Resources Management Plan [EN010168/APP/7.15]** and the Water Management Plan to be produced for inclusion in the detailed CEMP; and
- These embedded mitigation measures have been factored into the assessment of likely significant effects set out in the following sections. The assessments presented therefore reflect a "with embedded mitigation" scenario, in line with standard EIA practice.

Silt-laden Runoff

11.9.3 The following mitigation measures will be incorporated into the **Outline CEMP [EN010168/APP/7.12]**, and **Outline DS [EN010168/APP/7.14]**, for silt management and control:

- Works that are likely to generate silt-laden runoff (e.g. earthworks and excavations) will be done preferentially during the drier months of the year;
- Where practicable, during the construction/decommissioning phases, buffers of 10 m would be preserved adjacent to sensitive receptors to reduce impacts;
- Construction compounds and stockpiles would be located as far from receptors as possible;
- A drainage system will be developed to prevent silt-laden runoff from entering surface water drains, watercourses and ponds without treatment (e.g. earth bunds, silt fences, straw bales, or proprietary treatment);
- Earth stockpiles will be seeded as soon as possible, covered with geotextile mats or surrounded by a bund;

- Mud will be controlled at entry and exits to the Solar PV Sites using wheel washes and/or road sweepers;
- Tools and plant will be washed out and cleaned in designated areas within Solar PV Sites compound where runoff can be isolated for treatment before discharge to watercourse under appropriate consent;
- Debris and other material such as dust will be prevented from entering nearby receptors through the use of standard construction-phase pollution control measures, such as silt fences, straw bales, bunding, wheel washing and dust suppression; and
- Construction/decommissioning SuDS (such as temporary attenuation) to be used during construction/decommissioning if necessary.

Spillages and Leaks of Pollutants

11.9.4 Measures to control the storage, handling and disposal of chemicals, fuels/oils and other substances will be put in place prior to and during construction/decommissioning. The following key mitigation measures relating to the control of spillages and leaks will be included in the **Outline CEMP [EN010168/APP/7.12]**;

- Fuel for construction vehicles will be stored and managed in compliance with the Control of Substances Hazardous to Health Regulations 2002 and the Control of Pollution (Oil Storage) (England) Regulations 2001 (Ref 11-28);
- Fuel and other potentially polluting chemicals are to be stored in a secure impermeable and bunded area;
- Refuelling of plant to take place off the Solar PV Sites, where practicable, or only in a designated area at the Solar PV Sites compound ideally at least 20 m from sensitive receptors;
- All plant/machinery/vehicles will be regularly inspected and maintained to ensure they are in good working order and clean for use in a sensitive environment. This maintenance is to take place off the Solar PV Sites, where practicable, or only at designated areas in the Solar PV Sites compound;
- All fixed plant used on the Solar PV Sites would be self-bunded, meaning the equipment will have an integrated containment system designed to prevent any potential leaks or spills from escaping;
- Plant to be in good working order, kept clean and fitted with drip trays where appropriate;
- An Emergency Response Plan will be prepared and included in the **Outline CEMP [EN010168/APP/7.12]**. Spill kits and oil absorbent material to be carried by mobile plant and located at vulnerable locations on the Solar PV Sites. Construction workers will receive spill response training;

- The Solar PV Sites are to be kept secure to prevent vandalism that could lead to a pollution incident;
- Surface water drains on roads, other watercourse crossings or the core Scheme compound area will be identified and where there is a risk that silt laden runoff could enter them, they will be protected (e.g. covers or sandbags);
- Where HDD is used, a breakout contingency procedure will be included in the detailed CEMP to manage accidental releases of drilling fluid, including immediate containment and clean-up measures, in accordance with the **Outline CEMP [EN010168/APP/7.12]**; and
- Concrete wash water, generated during construction when concrete operations come into contact with water, will be contained in suitable facilities (e.g. geotextile-wrapped skips, sealed containers, or earth-bunded areas).

11.10 Assessment of Likely Impacts and Effects

11.10.1 This section considers the potential impacts outlined in Section 11.8 and, taking into account the committed mitigation measures as detailed in Section 11.9, assesses the potential for the Scheme to generate effects using the methodology as detailed in Section 11.6.

Construction

Potential Flood Risk/Drainage Impacts

Mud and Debris Blockages

11.10.2 There is the potential for mud and debris generated during construction activities to enter existing surface water and land drainage systems, leading to blockages and restricted flows. This could result in localised flooding, particularly following heavy or prolonged rainfall. The baseline risk is considered limited given the current agricultural use of the site. However, as construction progresses and surface water drainage infrastructure is installed, the potential for this effect increases.

11.10.3 Where required, temporary drainage infrastructure will be installed in advance of construction works. A robust maintenance regime will be secured through the **Outline CEMP [EN010168/APP/7.12]** and maintained throughout the construction phase. Equivalent safeguards will be secured during the decommissioning phase through the **Outline Decommissioning Strategy [EN010168/APP/7.14]**.

11.10.4 The sensitivity of receptors, including people, property, and construction workers or equipment, is considered to be Medium. Taking into account the embedded mitigation measures, including temporary drainage controls and

ongoing maintenance during construction, the magnitude of impact is considered to be Negligible. This results in a residual effect that is Minor Adverse and not significant in EIA terms. The duration of any impact would be short-term and limited to the construction phase only.

Temporary Increase in Impermeable Area

11.10.5 Temporary increases in impermeable area during construction and decommissioning have the potential to increase flood risk both on and off site. Temporary hardstanding or compacted areas could result in more rapid surface water runoff to local watercourses or cause an increase in overland flow. As the Scheme is currently greenfield, there is potential for overland flow paths to form and for localised flooding to occur.

11.10.6 These risks will be appropriately managed through embedded mitigation measures, including the installation of temporary drainage infrastructure, vegetated buffer strips, and linear infiltration trenches, as outlined in the **Outline CEMP [EN010168/APP/7.12]** and **ES Volume 3, Appendix 11-1: Flood Risk Assessment and Drainage Strategy [EN010168/APP/6.3]**. Equivalent safeguards will be implemented during the decommissioning phase via the **Outline Decommissioning Strategy [EN010168/APP/7.14]**.

11.10.7 The sensitivity of construction workers and equipment is considered to be Medium. With embedded mitigation in place, the magnitude of impact is considered to be Low. The residual effect is therefore assessed as Minor Adverse and not significant in EIA terms. The duration of this effect is short-term, limited to the active construction and decommissioning phases only.

Compaction of Soils

11.10.8 Temporary increases in soil compaction during the construction phase have the potential to increase flood risk both within and outside of the Scheme. Temporary hardstanding and the movement of vehicles and heavy plant could lead to more rapid surface water runoff to local watercourses or an increase in overland flow. As the Scheme is currently agricultural, there is potential for overland flows to be created and for localised flooding to occur, particularly during high rainfall events.

11.10.9 The construction of access tracks and the movement of heavy machinery may compact soils, reducing their permeability and aeration. This can lead to increased surface water runoff and reduce the soil's ability to support vegetation. Although the underlying superficial geology is of low permeability and currently in agricultural use, construction activity could still cause temporary, localised deterioration in soil structure.

11.10.10 Uncontrolled compaction may alter the hydrological function of the soil and reduce the ability of existing drainage infrastructure to operate effectively. If

drainage pathways become impaired, this could lead to waterlogging and localised flooding.

11.10.11 Embedded mitigation measures include the retention of existing access tracks where practicable, limiting construction traffic to designated routes, and implementing soil handling and reinstatement protocols as set out in **Section 11.9**, the **Outline CEMP [EN010168/APP/7.12]**, and the **Outline Soil Resources Management Plan [EN010168/APP/7.15]**.

11.10.12 Taking embedded mitigation into account, the magnitude of impact is considered to be Low. The sensitivity of receptors, including people, property and construction workers or equipment, is Medium. The residual effect is therefore assessed to be Minor Adverse and not significant in EIA terms. This effect would be temporary, limited to the construction phase.

Potential Water Resources Impacts

Silt-laden Runoff

11.10.13 Construction activities such as excavation dewatering, concreting, earthworks and the movement of heavy plant have the potential to generate silt-laden runoff. If unmanaged, sediment mobilisation can result in the discharge of silty water to surface watercourses or infiltration to groundwater, potentially degrading water quality and harming aquatic ecology. Runoff may also contain pollutants such as oil, fuel or concrete washings, increasing the risk of contamination.

11.10.14 Embedded mitigation measures will be implemented from the outset of construction to minimise the potential for sediment mobilisation and prevent silt migration to receiving waterbodies. These measures include perimeter buffer zones around sensitive receptors, use of silt fencing and temporary swales, control of water at source through staged excavation and working areas, and provision of designated washout and refuelling zones. These measures are secured through the **Outline CEMP [EN010168/APP/7.12]** and the Water Management Plan to be produced with the detailed CEMP.

11.10.15 Taking embedded mitigation into account, the magnitude of impact on surface and groundwater quality is considered to be Low. The sensitivity of receptors is considered to be Medium, as the receiving environment includes surface watercourses and unproductive aquifers. The residual effect is therefore assessed to be Minor Adverse and not significant in EIA terms. This effect would be temporary, limited to the construction phase.

Spillages, Leakages and Pollutants

11.10.16 During the construction phase, fuel, hydraulic fluids, solvents, grouts, paints, detergents and other potentially polluting substances will be stored and used across the Site. If not properly managed, these substances could be mobilised by rainfall or site runoff, entering surface water or infiltrating to groundwater,

with potential to degrade water quality and affect aquatic and terrestrial ecosystems within and downstream of the Site.

11.10.17 Embedded mitigation measures will be implemented from the outset to prevent and contain pollution incidents. These include bunded storage areas for fuels and chemicals, designated refuelling zones set away from sensitive receptors, routine inspection and maintenance of plant and equipment, provision of spill kits at key locations, and staff training in spill response protocols. These measures are secured through the **Outline CEMP [EN010168/APP/7.12]**, which includes a commitment to pollution prevention and emergency response.

11.10.18 The sensitivity of the water environment is considered to be High, particularly due to the presence of a Drinking Water Groundwater Safeguard Zone within the central part of the BESS Area. Taking embedded mitigation into account, the magnitude of impact is assessed to be Negligible. The resulting effect on water resources from potential spillages, leakages or pollutants is therefore assessed to be Minor Adverse and not significant in EIA terms. This effect would be temporary, limited to the construction phase.

Increase in Highway Routine Runoff/Spillage Risk

11.10.19 During the construction phase, traffic movements across the Site are more frequent and diverse than during operation, with regular HGV access, movement of plant and delivery vehicles, and temporary facilities such as welfare and material storage areas. These activities have the potential to generate silt-laden runoff and mobilise contaminants such as fuel and oil during rainfall, presenting a temporary risk to the surrounding water environment.

11.10.20 Embedded mitigation measures have been incorporated into the Scheme design to reduce this risk. These include the use of permeable surfaces such as compacted gravel for access tracks and working areas, promoting infiltration and reducing runoff. Linear infiltration trenches are proposed alongside key routes and compounds, providing near-source drainage and limiting flow conveyance. Watercourses are protected by a minimum eight metre development-free buffer, and temporary measures such as silt fencing and straw bales will be used as required during early works and soil handling. Vegetated buffers and wildflower margins will also be used where practicable to intercept suspended solids and reduce erosion.

11.10.21 These drainage and pollution prevention measures are secured through the **Outline CEMP [EN010168/APP/7.12]** and described in **ES Volume 3, Appendix 11-1: Flood Risk Assessment and Drainage Strategy [EN010168/APP/6.3]**.

11.10.22 The sensitivity of the water environment is considered to be High due to the presence of minor surface watercourses within the Site and its location within a Drinking Water Groundwater Safeguard Zone. With the embedded mitigation in place, the magnitude of impact is Negligible. The resulting residual effect on

water quality from highway-related runoff and spillages during construction is assessed to be Minor Adverse, temporary, and not significant in EIA terms.

Increased Demand on Water Supply

11.10.23 Water usage during the construction phase will be limited and temporary, primarily related to welfare facilities, dust suppression, and occasional equipment wash-down. Water will be sourced from a mains connection where practicable or delivered by a licenced water supplier. No abstraction from local surface water features or groundwater is proposed. The Scheme does not rely on sensitive water sources for construction activities, and the temporary increase in demand is not expected to affect the availability of public or private supplies.

11.10.24 Embedded mitigation includes coordination with the appointed contractor and utilities provider to ensure continuity of supply and avoid disruption to other users. Where needed, tankered supply may be used as a contingency.

11.10.25 These controls are addressed further in the **Outline Water Resources Strategy [EN010168/APP/7.25]** and secured through the **Outline CEMP [EN010168/APP/7.12].**

11.10.26 The sensitivity of the local water environment is considered to be Low, and the magnitude of additional demand is considered to be Negligible. When accounting for embedded mitigation and the short duration of construction activities, the residual effect on water supply is assessed to be Negligible, temporary, and not significant in EIA terms.

Inappropriate Wastewater Disposal from Welfare Facilities

11.10.27 As there are no public foul water sewers within the vicinity of the Scheme, welfare facilities used during construction will rely on self-contained units managed and maintained by a licensed contractor. These units are sealed, require no connection to on-site drainage infrastructure, and will be emptied and removed from site as required.

11.10.28 This approach prevents any discharge of wastewater to land, surface water, or groundwater. The risk of pollution is therefore eliminated at source. These arrangements are secured through the **Outline CEMP [EN010168/APP/7.12]**, which includes provisions for welfare facility management and waste handling.

11.10.29 The sensitivity of surrounding water resources to inappropriate wastewater disposal is considered to be Medium. However, in the absence of a pathway for contamination, and taking into account the limited duration of construction activities, the magnitude of impact is considered to be negligible. The residual effect is assessed to be Minor Adverse and insignificant in EIA terms.

HDD and Drilling Fluid Breakout Risk

11.10.30 The use of HDD to install cable beneath watercourses, roads, and other sensitive areas carries a temporary risk of drilling fluid escaping to the surface or entering the water environment. This may occur if drilling pressures exceed the surrounding ground strength, particularly where superficial deposits are fractured or groundwater is shallow. A breakout (or 'frac-out') event could result in the release of bentonite-based fluid, which may temporarily degrade water quality in nearby surface watercourses or shallow groundwater.

11.10.31 To mitigate this risk, the Scheme includes embedded controls secured through the **Outline CEMP [EN010168/APP/7.12]**, **Outline OEMP [EN010168/APP/7.13**], and a Water Management Plan to be produced at the detailed design stage. These documents will incorporate a breakout contingency procedure, which will require works to stop immediately in the event of a breakout. The procedure will include containment measures, clean-up methods, and regulatory notification protocols to ensure environmental protection.

11.10.32 The sensitivity of surrounding water resources to drilling fluid breakout risk is considered to be Medium. With the mitigation measures in place, the residual magnitude of effect is considered to be Low, and the significance is Minor Adverse. The effect would be temporary, limited to the construction phase, and is not significant in EIA terms.

Operation

Potential Flood Risk/Drainage Impacts

Increase in Impermeable Area

11.10.33 The Scheme has been designed to minimise the introduction of impermeable surfaces. The panelled areas are not surfaced and will remain vegetated throughout operation, allowing for direct rainfall infiltration and maintaining greenfield runoff characteristics. This reduces the potential for changes to surface water flow patterns or volumes. However, certain operational infrastructure such as substations, the BESS Area, and access tracks will introduce small areas of permanent hardstanding, which could lead to increased surface runoff and minor localised flooding if unmanaged.

11.10.34 Embedded mitigation measures, as set out in Section 11.9, include the use of permeable surfacing for operational access routes and compound areas. Panel layouts are designed to retain vegetation beneath and between rows, which intercepts and attenuates runoff. Areas of formal hardstanding, such as the BESS Area and substations, incorporate SuDS-based drainage measures, including permeable sub-bases and lined infiltration trenches or soakaways where appropriate. These controls are detailed in **ES Volume 3, Appendix 11-1: Flood Risk Assessment and Drainage Strategy [EN010168/APP/6.3]**, and secured through the **Outline OEMP [EN010168/APP/7.13]**.

11.10.35 The sensitivity of operational receptors, including people, property, and infrastructure, is considered Medium. With the embedded measures in place, the magnitude of effect is considered Low, and the residual significance is assessed to be Minor Adverse. Effects would be long-term but are not significant in EIA terms. The Solar PV Sites are expected to drain in a manner consistent with pre-development conditions.

Increase in Discharge to Local Watercourses

11.10.36 An increase in the volume of water discharged to nearby watercourses has the potential to increase flood risk downstream of the Scheme. This is only relevant to areas of formal hardstanding where discharge may be required, such as the substations or BESS Area. Across the panelled areas, discharge is not proposed, and drainage will remain as greenfield, with rainfall infiltrating directly into the soil or managed via passive drainage features appropriate to local conditions.

11.10.37 Embedded mitigation, described in Section 11.9, includes sealed drainage systems for the BESS Area and substation areas, designed to manage surface water runoff and pollution risk in line with greenfield discharge assumptions. Across the wider panelled areas, only minor isolated infrastructure such as conversion units or cable jointing pillars will be served by linear infiltration trenches to manage surface water at source and prevent lateral migration. Gravel-filled trenches or French drains, or similar passive SuDS features, will be used around equipment and access tracks where required, and wildflower planting beneath and at the leeward edge of Solar PV Panels will stabilise the soil and limit any potential for silt-laden runoff. Existing farm tracks will be retained where practicable to minimise soil compaction, and any new access will be permeable. These measures are designed to ensure surface water discharge rates from the Scheme remain comparable to baseline greenfield conditions. **ES Volume 3, Appendix 11-1: Flood Risk Assessment and Drainage Strategy [EN010168/APP/6.3]** sets out how these components will be incorporated into the final drainage design.

11.10.38 SuDS components will be maintained throughout the operation and maintenance phase in accordance with the **Outline OEMP [EN010168/APP/7.13]**, ensuring they continue to function effectively and do not contribute to cumulative increases in runoff or discharge to local watercourses over time.

11.10.39 The sensitivity of downstream receptors, including people and property, is considered Medium. The magnitude of impact with the embedded mitigation is considered to be Negligible. With embedded mitigation and maintenance controls in place, the residual effect is assessed as Minor Adverse, of long-term duration, and not significant in EIA terms.

Blockage of Drainage Networks

11.10.40 There is potential for drainage systems serving formal infrastructure such as the BESS Area and substations to become blocked by debris during the operation and maintenance phase. This could lead to localised surface water flooding within the Site and increase flood risk downstream, particularly during or following heavy rainfall events.

11.10.41 Across the panelled areas, embedded mitigation includes retention of grassed groundcover beneath and between the Solar PV Panels, ongoing vegetation management, and the use of permeable access tracks. These features limit sediment mobilisation and help maintain natural infiltration, reducing reliance on formal drainage systems. Where passive drainage features such as gravel-filled trenches or French drains are used, these will be designed to suit local conditions and include appropriate filtration where necessary.

11.10.42 Drainage systems associated with formal infrastructure will be designed in accordance with industry good practice and include pollution control measures such as sealed or lined components where required. Maintenance of all operational drainage infrastructure will be secured via the **Outline OEMP [EN010168/APP/7.13]**, with a dedicated management team responsible for inspections, clearance of debris, and repairs throughout the life of the Scheme.

11.10.43 The sensitivity of receptors, including people, properties and operational infrastructure, is considered to be Medium. With the implementation of embedded mitigation the magnitude of impact is considered to be Negligible. Therefore, the residual effect is assessed as Minor Adverse, of long-term duration, and not significant in EIA terms.

Potential Water Resources Impacts

Diffuse Pollution Contained in Urban Runoff

11.10.44 During the operation and maintenance phase, there is potential for diffuse pollution to enter the local water environment. Runoff from hardstanding areas such as the BESS Area, substations and access tracks could contain low concentrations of hydrocarbons, heavy metals, nutrients, debris and silt. These pollutants may be transported to nearby watercourses via surface water runoff or infiltrate into the ground, potentially affecting surface and groundwater quality.

11.10.45 Embedded mitigation measures, as outlined in Section 11.9, include sealed drainage systems for the BESS Area and substations designed to capture and contain contaminated runoff, preventing uncontrolled discharge. Permeable access tracks and grassed groundcover beneath and between Solar PV Panels help reduce the mobilisation and transport of pollutants by encouraging infiltration and filtering out particulates. Runoff from equipment and tracks will be directed to gravel-filled trenches or French drains where appropriate, and wildflower planting at the leeward edge of panel rows will further reduce the likelihood of silt-laden runoff entering the wider environment.

11.10.46 An overview of the proposed SuDS features and their management is provided in **ES Volume 3, Appendix 11-1: Flood Risk Assessment and Drainage Strategy [EN010168/APP/6.3]**, and maintenance will be secured through the **Outline OEMP [EN010168/APP/7.13]**.

11.10.47 The sensitivity of surface and groundwater receptors to diffuse pollution is considered to be Medium. With embedded mitigation measures in place the magnitude of impact is considered Negligible. Therefore, the residual effect on water quality is considered to be Minor Adverse, of long-term duration, and not significant.

Diffuse Pollution Resulting from Fire

11.10.48 There is a potential risk of fire during the operation and maintenance phase that could generate contaminated runoff and negatively affect the local water environment. While the likelihood of fire associated with panelled areas is considered low, a higher risk exists at the BESS Area and substation areas due to the nature of the electrical infrastructure and energy storage components.

11.10.49 Runoff generated during or following a fire could contain pollutants such as hydrocarbons, heavy metals, debris and silt. If not appropriately managed, this runoff may be discharged to nearby watercourses or infiltrate to ground, resulting in deterioration of water quality. This is particularly relevant for BESS infrastructure located within a Drinking Water Groundwater Safeguard Zone, where the sensitivity of groundwater receptors is high.

11.10.50 The Scheme design incorporates embedded mitigation to prevent uncontrolled discharges. BESS Area and substation areas are served by sealed, lined SuDS-based drainage systems with gravel subbases and automatically actuating isolation valves at outfalls. These systems are designed to contain and isolate contaminated runoff during emergency events. In the event of a fire, valves would automatically close, retaining runoff on site for testing and appropriate disposal or treatment, in consultation with the Environment Agency and other regulators.

11.10.51 Firewater infrastructure aligns with the National Fire Chiefs Council Grid Scale Battery Energy Storage System Planning Guidance. Hydrants capable of delivering at least 1,900 litres per minute for two hours will be provided within Lime Down D, sited close to the BESS containers to allow effective access for emergency responders. The **Outline Battery Safety Management Plan [EN010168/APP/7.21]** confirms these provisions, and fire suppression systems will be designed in accordance with industry good practice.

11.10.52 Evidence from other BESS Areas, including the Thurrock incident, suggests that when firewater systems and containment measures are correctly implemented, fires have been extinguished quickly and contaminated water successfully retained. This reduces the likelihood of a prolonged incident that could overwhelm the drainage system.

11.10.53 Further control measures, including emergency response protocols, pollution control procedures and water quality monitoring, are secured through the **Outline CEMP [EN010168/APP/7.12]** and **Outline OEMP [EN010168/APP/7.13]**. These plans provide a comprehensive framework for managing fire-related risks to the water environment during the operation and maintenance phase.

11.10.54 Although receptor sensitivity is High, the likelihood of uncontrolled release is low due to the robustness of embedded measures. As a result, the magnitude of impact is considered Negligible, and the residual effect is assessed as Minor Adverse, of long-term duration, and not significant in EIA terms.

Increase in Highway Routine Runoff/Spillage Risk

11.10.55 There is no significant traffic flow associated with the Scheme during normal operation. The construction phase represents the worst-case scenario in terms of traffic frequency and spillage risk. During the operation and maintenance phase, vehicle movements will typically involve light maintenance vehicles and occasional deliveries, confined to designated access tracks and occurring infrequently. Occasional periods of increased activity may occur during equipment replacement or repair, but these would be temporary, planned in advance, and subject to the same embedded controls.

11.10.56 Access tracks and hardstanding areas have been designed with embedded mitigation features that reduce the risk of pollutants entering the environment during rainfall. These include the use of permeable surfacing, such as compacted gravel, to promote direct infiltration and reduce runoff. Vegetated margins and wildflower planting are proposed along access routes and across panelled areas to filter pollutants and reduce surface erosion. Linear infiltration trenches are proposed adjacent to isolated infrastructure and access routes to retain runoff close to source. In addition, gravel-filled trenches and French drains are proposed where appropriate to replicate greenfield drainage conditions and minimise alteration to natural flow patterns. All watercourses within or near the Scheme are protected by a minimum eight metre development-free buffer, providing an added safeguard against direct discharge to sensitive receptors.

11.10.57 These measures are described in **ES Volume 3, Appendix 11-1: Flood Risk Assessment and Drainage Strategy [EN010168/APP/6.3]**, and are secured through the DCO via the **Outline CEMP [EN010168/APP/7.12]** and **Outline OEMP [EN010168/APP/7.13]**.

11.10.58 The sensitivity of surface and groundwater resources is considered High, due to the presence of a Drinking Water Groundwater Safeguard Zone and nearby watercourses. However, routine operational traffic movements are infrequent, and embedded SuDS-based mitigation features have been incorporated to intercept and manage any incidental runoff. Occasional equipment replacement

activities are not expected to materially increase the risk, given their short duration and the continued application of drainage controls. Considering the low pollutant load, limited likelihood of incidents, and the effectiveness of embedded mitigation, the magnitude of impact is considered Negligible. The residual effect is therefore assessed to be Minor Adverse and not significant in EIA terms for the duration of the operation and maintenance phase.

Increased Demand on Water Supply

11.10.59 During the operation and maintenance phase, the Scheme would not result in a significant increase in water demand. Routine activities across the site are limited to occasional cleaning, light maintenance, and vegetation management. Water requirements associated with these activities are minimal and unlikely to require any permanent supply or connection. Operational water use is not expected to be sourced from surface waters or groundwater.

11.10.60 Firewater requirements have been specifically addressed at the Battery Energy Storage System (BESS) areas, in accordance with the National Fire Chiefs Council (NFCC) Grid Scale Battery Energy Storage System Planning Guidance (Ref: 11-29). This guidance recommends that hydrant supplies capable of delivering at least 1,900 litres per minute for two hours are provided at each BESS Area location, or an equivalent firewater provision that allows for boundary cooling during emergency events. These requirements have been factored into the Scheme design and are described in the **Outline Battery Safety Management Plan (BSMP) [EN010168/APP/7.21]**. Local firewater provision is included at Lime Down D and is designed to be self-contained, meaning no abstraction from local surface waters or groundwater is required for firefighting purposes.

11.10.61 Where required, contingency water could be delivered via tanker during an emergency. Such vehicle movements would be infrequent and are considered within the traffic volumes assessed in considerations, is provided in **ES Volume 1, Chapter 13: Transport and Access [EN010168/APP/6.1]**. No potable water connections are currently proposed, and the Scheme is not located within a designated water-stressed area. As such, securing a supply to support low-frequency operational requirements is not expected to result in material pressure on local resources.

11.10.62 The sensitivity of surface water and groundwater resources is considered to be Low with an impact of Negligible magnitude in this context, and the embedded provision of localised firewater infrastructure, alongside the absence of reliance on abstraction or mains water connections, ensures that operational water use would not give rise to significant effects. The residual effect is assessed to be Negligible and not significant in EIA terms. Further detail is provided in the **Outline Water Resources Strategy [EN010168/APP/7.25]**.

Disposal of Surface Water and Foul Water from the Site

11.10.63 Associated infrastructure such as Conversion Units, substations, and the BESS Area will increase the permanent impermeable area and associated surface water runoff. Without appropriate control, this could lead to localised surface water flooding within the Site and increase flood risk downstream. However, surface water will continue to follow existing flow paths, discharging to local land drainage ditches or watercourses in line with natural topography. The Drainage Strategy incorporates embedded mitigation measures including permeable surfacing for access routes, gravel-filled trenches and French drains adjacent to small infrastructure, and wildflower planting at the leeward edge of Solar PV Panels to intercept and attenuate surface water. The BESS Area and substation areas will include lined, sealed SuDS-based drainage systems with gravel subbases and pollution control features, including automatically actuating valves, which prevent runoff discharge in the event of a fire or spill. The public surface water sewer will not receive any flow from the Site. SuDS features will be sized to attenuate runoff from impermeable areas for a 1 in 100 year rainfall event plus climate change, with discharge restricted to greenfield runoff rates. The design approach ensures runoff is appropriately managed across the Site and does not result in increased flood risk.

11.10.64 Routine operation of the Site will not involve foul water generation beyond low-volume welfare use. There is no known public foul sewer within or near the Site. Any welfare provision at substations will be served by self-contained septic tanks, emptied periodically by tanker. During occasional programmed equipment replacement periods, on-site staffing may increase temporarily. However, the drainage approach will remain unchanged, with tanker collections increased as needed to manage peak foul wastewater volumes.

11.10.65 The sensitivity of surface and groundwater resources to wastewater disposal is considered to be Medium with an impact of Low magnitude on downstream watercourses. As all foul water is contained and removed from Site, and surface water discharges are controlled via embedded SuDS, the residual effect on water quality and flood risk is assessed as Minor Adverse and not significant. Further detail is provided in the **Outline Water Resources Strategy [EN010168/APP/7.25].**

Equipment Replacement

11.10.66 During programmed replacement of equipment, including Solar PV Panels and batteries, certain short-term impacts similar to those identified for the construction and decommissioning phases may occur. These could include temporary increases in traffic, ground disturbance, and pollutant risk. Such activities would be infrequent and planned in advance, and all relevant mitigation secured through the **Outline CEMP [EN010168/APP/7.12]**, **Outline OEMP [EN010168/APP/7.13]**, and associated management plans such as the **Outline BSMP [EN010168/APP/7.21]** would apply during these periods. Once

replacement works are completed, the Scheme would resume normal operation, and the temporary impacts would cease.

Decommissioning

11.10.67 Hydrology, flood risk, and drainage impacts during the Scheme decommissioning phase would be similar to or less than the impacts during the construction phase. The assessment presented for the construction phase will therefore be representative (or an overestimate) of the decommissioning phase. As such, a separate assessment for hydrology, flood risk, and drainage during the decommissioning phase is not presented.

11.11 Additional Mitigation

11.11.1 No additional mitigation measures are considered necessary. Through discussions with relevant stakeholders and the implementation of embedded mitigation, all potential impacts on hydrology, flood risk and drainage have been reduced such that no significant residual effects are expected. The embedded measures are secured through the DCO and associated management plans, and no further mitigation is proposed.

11.12 Residual Effects and Conclusions

11.12.1 This section summarises the residual effects of the Scheme on Hydrology, Flood Risk and Drainage, following the implementation of embedded mitigation and any additional good practice measures during construction and operation.

11.12.2 All potential effects identified have been subject to detailed assessment and, with the embedded mitigation measures described in Section 11.9 and secured through the **Outline CEMP [EN010168/APP/7.12]**, **Outline OEMP [EN010168/APP/7.13]**, and other referenced control documents, all residual effects are considered to be of negligible significance and not significant in EIA terms.

11.12.3 Significant residual effects are defined as those of moderate or major significance. No such effects are predicted for either the construction, operation or decommissioning phases. A summary of construction and decommissioning phase residual effects is provided in **Table 11-8**, and operational phase effects are summarised in Section 11.10 above and within **ES Volume 1, Chapter 22: Summary of Residual Effects [EN010168/APP/6.1]**.

Table 11-8:Summary of Significant Residual Effects (Construction and Decommissioning)

Receptor	Sensitivity (value)	Description of impact	Mitigation/Enhancement measure	Residual effect after mitigation
Mud and Debris Blockages	Medium	Potential for mud and debris arising from the construction/decommissioning works to enter the existing surface water/land drainage system, causing blockages and restricting flow.	Embedded mitigation measures relevant to mud and debris blockages are outlined in Section 11.9. Where deemed necessary, a temporary drainage network will be installed prior to the commencement of construction and a robust maintenance plan confirmed through the **Outline CEMP [EN010168/APP/7.12]** which would be maintained throughout the duration of construction phase. This is a precautionary safeguarding approach to reduce the risk to the workers and help reduce the likelihood of the above significant effects. This would be maintained during the decommissioning phase through the Decommissioning Strategy.	Minor Adverse (Not Significant)
Temporary Increase in Impermeable Area	Medium	Temporary increase in impermeable area during construction/decommissioning has the potential to increase flooding both on and offsite. Temporary hardstanding or compacted areas could result in rapid surface water runoff to local watercourses or cause an increase in overland flow.	Embedded mitigation measures relevant to soil compaction are outlined in Section 11.9. These include adhering to construction mitigation guidance such as ensuring impermeable areas within the Solar PV Sites are increased as little as possible and, where necessary, installing temporary surface water drainage systems during construction. This effect is expected to lessen as the Scheme progresses and surface water drainage networks are installed. These measures are set out in the **Flood Risk Assessment and Drainage Strategy [EN010168/APP/6.3]** and secured through the **Outline CEMP [EN010168/APP/7.12]**.	Minor Adverse (Not Significant)

Receptor	Sensitivity (value)	Description of impact	Mitigation/Enhancement measure	Residual effect after mitigation
Compaction of Soils	Medium	Construction of access tracks and the movement of vehicles and heavy plant during the construction and decommissioning phases has the potential to compact soils.	Embedded mitigation measures relevant to soil compaction are outlined in Section 11.9. Construction mitigation guidance would be adhered to in order to minimise the compaction of soils and flood risk to people and/or property at the Solar PV Sites and surrounding areas. For example, existing access tracks, where practicable, would be retained to limit the disturbance to soils; appropriate soil handling and storage protocols as outlined in the **Outline Soil Resources Management Plan [EN010168/APP/7.15]**.	Minor Adverse (Not Significant)
Silt-laden runoff	Medium	During the construction and decommissioning phases of the Scheme, a number of activities have the potential to negatively affect the local water environment. Activities such as dewatering of excavation, concreting earthworks, and the use of heavy plant can lead to significant quantities of silty runoff.	Embedded mitigation measures, as set out in Section 11.9, include silt management through the **Outline CEMP [EN010168/APP/7.12]** and Water Management Plan. These measures will control silty runoff at source using features such as buffer zones, silt fences, and designated plant washout areas.	Minor Adverse (Not Significant)
Spillages, Leaks and Pollutants	High	During construction and decommissioning, fuel, hydraulic fluids, solvents, grouts, paints, detergents and other potentially polluting substances will be stored and used on the Site.	Embedded mitigation measures, as set out in Section 11.9and secured through the **Outline CEMP [EN010168/APP/7.12]** include bunded storage areas, designated refuelling zones away from sensitive areas, regular inspection and maintenance of plant and equipment,	Minor Adverse (Not Significant)

Receptor	Sensitivity (value)	Description of impact	Mitigation/Enhancement measure	Residual effect after mitigation
		Leaks or spillages of these substances could pollute surface watercourses or infiltrate to groundwater if not carefully managed.	provision of spill kits at key locations, and staff training in spill response. These measures will reduce the risk of uncontrolled discharges to water.	
Increase in Highway Routine Runoff/Spillage Risk	High	During the construction phase, the Scheme will generate increased vehicle movements and temporary hardstanding, particularly around compound areas and along access routes. Construction vehicles and machinery have the potential to generate surface water runoff containing pollutants such as hydrocarbons, oils, heavy metals and silt. These may be transported to nearby land drainage ditches or watercourses if not properly managed. There is also potential for accidental spillage during refuelling or maintenance of construction equipment, which could affect local surface water or groundwater quality, particularly within the Drinking Water Groundwater Safeguard Zone.	Embedded mitigation measures, as described in Section 11.9, include the use of perimeter buffers, designated refuelling and storage areas, and good practice construction drainage (e.g. settlement tanks, bunded storage, and spill response plans). Runoff from construction compounds and access routes will be managed via temporary SuDS where practicable, such as gravel surfacing, straw bales, or lined settlement areas. Construction-phase pollution prevention and runoff control measures are secured through the **Outline CEMP [EN010168/APP/7.12]**.	Minor Adverse (Not Significant)
Increased Demand on Water Supply	Medium	During the construction phase, water will be required for activities such as dust suppression, welfare facilities,	The **Outline CEMP [EN010168/APP/7.12]** confirms that construction-phase water use will be managed to avoid impacts on sensitive receptors, with appropriate storage and	Negligible (Not Significant)

Receptor	Sensitivity (value)	Description of impact	Mitigation/Enhancement measure	Residual effect after mitigation
		and some construction processes. While this represents a temporary increase in water demand, the overall requirement is limited and unlikely to place pressure on local water resources. Water will not be abstracted from surface water features or groundwater bodies on site, and any supply will be sourced from licensed off-site providers or delivered via tanker. No potable water connections are currently proposed.	handling of water on site. The **Outline Water Resources Strategy [EN010168/APP/7.25]** sets out that where practicable water supply will be via a mains water connection or tankering, and that sustainable supply methods (e.g. bowser delivery) will be used where required.	
Inappropriate Wastewater Disposal from Welfare Facilities	Medium	N/A	Embedded mitigation measures, as set out in Section 11.9.	Minor Adverse (Not Significant)
HDD and Drilling Fluid Breakout Risk	Medium	The use of HDD to install cables beneath watercourses and other sensitive areas presents a risk of drilling fluid escaping to the surface or entering the water environment.	Embedded mitigation as set out in Section 11.9, through the **Outline CEMP [EN010168/APP/7.12]** and a Water Management Plan, which will include a breakout contingency procedure. This will set out the response in the event of a breakout, including temporary suspension of works, containment and clean-up measures, and notification protocols.	Minor Adverse (Not Significant)

Table 11-9:Summary of Significant Residual Effects (Operation)

Receptor	Sensitivity (value)	Description of impact	Mitigation/Enhancement measure	Residual effect after mitigation
Increase in Impermeable Area	Medium	Given the size of the Scheme, the increase in permanent impermeable area on the Site is negligible in comparison to the total area covered by the Scheme. The panelled areas are designed to remain permeable, with grassland beneath and between the panels maintained to encourage infiltration and minimise runoff. However, infrastructure such as the substations and BESS Area will introduce impermeable surfacing. This has the potential to exacerbate localised surface water flooding within the Site and increase flood risk to people and property in the immediate surrounding area and downstream.	Embedded mitigation measures, as set out in Section 11.9, include the use of permeable surfacing for access tracks and the retention of vegetated groundcover across panelled areas. These features reduce runoff generation and help maintain the existing surface water regime.	Minor Adverse (Not Significant)
Increase in Discharge to Local Watercourses	Medium	The increase in the volume of water discharged to local watercourses in areas where discharge is proposed has the potential to increase flood risk downstream of the Scheme. This is relevant only to locations where discharge to watercourse	Embedded mitigation in Section 11.9, through the **Outline OEMP [EN010168/APP/7.13],** the **Outline CEMP [EN010168/APP/7.12]** and a Water Management Plan, which will include a breakout contingency procedure. This will set out the response in the event of a breakout, including temporary suspension of works, containment and clean-up measures, and notification protocols.	Minor Adverse (Not Significant)

Receptor	Sensitivity (value)	Description of impact	Mitigation/Enhancement measure	Residual effect after mitigation
		may be required, such as the substations or BESS Area.		
Blockage of Drainage Networks	Medium	There is potential for drainage networks to become blocked with debris from runoff during the operation and maintenance phase. This could result in localised surface water flooding within the Site and increase flood risk downstream due to elevated runoff to local watercourses, particularly after heavy or prolonged rainfall.	Drainage systems will be designed to good practice standards and the implementation of a robust maintenance plan will aid in reducing the risk of flooding as a result of blockages. A third-party management and maintenance team would be established to maintain features throughout the design life of the Scheme.	Minor Adverse (Not Significant)
Diffuse Pollution Contained in Urban Runoff	High	The operation and maintenance phase may negatively impact the local water environment. Runoff from the Site could contain diffuse urban pollutants such as hydrocarbons, heavy metals, nutrients, debris, and silt, which may ultimately discharge to nearby watercourses via surface water runoff or infiltrate to the ground.	Embedded mitigation measures, as set out in Section 11.9, includes maintaining vegetated groundcover across the Site and use of permeable access tracks. Where practical, at detailed design stage runoff from equipment and access tracks will be directed to permeable SuDS features with contributions being made from permeable surfacing, wildflower planting, and linear infiltration trenches.	Minor Adverse (Not Significant)
Diffuse Pollution Resulting from Fire	Medium	Given the nature of the Scheme there is a potential risk of fire during operation which may negatively affect upon the local water environment. Runoff from the Site, along with the associated infrastructure,	Embedded measures are proposed to reduce the risk of pollution from firewater runoff. At detailed design stage, runoff from the BESS Area will be contained by local bunding and attenuated within the gravel subgrade of lined permeable SuDS features prior to being passed forward to the local land drainage network. In	Minor Adverse (Not Significant)

Receptor	Sensitivity (value)	Description of impact	Mitigation/Enhancement measure	Residual effect after mitigation
		following a fire could contain diffuse urban pollutants such as hydrocarbons, heavy metals, as well as debris and silt which could ultimately be discharged to the nearby watercourses via surface water runoff or infiltrate to ground. Without mitigation this could have a moderate adverse effect on water quality.	the event of a fire, embedded measure**s** will be implemented, including automatically self-actuating valves at the outfalls from the BESS Area to isolate the drainage from the wider environment. The water contained by the valves will be tested and either treated and released or tankered off-site as necessary and in consultation with the relevant consultees at the time. These measures are described in **ES Volume 3, Appendix 11-1: Flood Risk Assessment and Drainage Strategy [EN010168/APP/6.3]** and the **Outline BSMP [EN010168/APP/7.21]**.	
Increase in Highway Routine Runoff/Spillage Risk	High	There is no significant traffic flows associated with the Scheme during the operation and maintenance phase. However, the associated infrastructure, such as access roads and limited vehicle movements for maintenance activities, may still introduce minor discharges of highway runoff into receiving watercourses. Surface water runoff from roads can contain pollutants such as hydrocarbons, heavy metals, and inert particulates, which, if untreated, could result in chronic pollution of the water environment. Additionally, accidental spillages of pollutants (e.g. oil) on highways could be transported to	Embedded mitigation measures, as set out in Section 11.9, includes, where practical, runoff from equipment and access tracks will be directed to permeable SuDS features with contributions being made from permeable surfacing, wildflower planting and linear infiltration trenches.	Minor Adverse (Not Significant)

Receptor	Sensitivity (value)	Description of impact	Mitigation/Enhancement measure	Residual effect after mitigation
		watercourses via runoff or infiltrate to the ground, posing risks to ecological life and groundwater quality.		
Increased Demand on Water Supply	Medium	Due to the nature of the Scheme, water usage during operation and maintenance is expected to be minimal and there would be no significant increase in demand for water that would place additional pressure on local resources. Water for operational needs is unlikely to be sourced from local surface waters. This is further addressed within the This is addressed further within the **Outline Water Resources Strategy [EN010168/APP/7.25]**.	N/A	Minor Adverse (Not Significant)
Disposal of Surface Water and Foul Water from the Solar PV Site	Medium	As the Scheme would only be visited by site personnel for maintenance, foul generation would be insignificant. Currently there is no known existing foul network on the Site or adjacent. Due to the nature of the Scheme wastewater associated with welfare facilities at the substations will be contained in a septic tank to be emptied as and when required by tanker as there	Embedded mitigation measures, as set out in Section 11.9.	Minor Adverse (Not Significant)

Receptor	Sensitivity (value)	Description of impact	Mitigation/Enhancement measure	Residual effect after mitigation
		will be no foul drainage network associated with the Site. Associated infrastructure such as Conversion Units, substations, and BESS Area will increase the permanent impermeable area and surface water runoff. This could potentially increase localised surface water flooding within the Site and elevate flood risk to nearby people and properties downstream.		
Equipment Replacement	Medium	During site-wide equipment replacement, the impacts described during the construction/decommissioning phase may temporarily apply during the operational and maintenance phase.	The relevant mitigation measures established for the construction and decommissioning phases, including pollution prevention controls, surface water management measures, and drainage maintenance procedures, would be temporarily applied during any equipment replacement activities. This approach ensures that risks to surface water and groundwater are appropriately managed and that no additional significant effects arise. These measures are detailed within the **Outline CEMP [EN010168/APP/7.12]** and will be incorporated into method statements and site management plans during the operational phase as required.	Minor Adverse (Not Significant)

11.13 Cumulative Effects Assessment

Inter-Project Cumulative Effects

11.13.1 This chapter considers potential impacts to the Zone of Influence (ZoI) over the lifetime of the Scheme and sets out the appropriate mitigation measures required. The assessment of the significance of effect is determined by considering the sensitivity of the receptor and magnitude of impacts during the construction, operation and decommissioning phases. Mitigation measures are then applied, and any residual likely significant effects are identified.

11.13.2 The ZoI for the assessment of hydrology, flood risk and drainage is limited to the Order Limits of the Scheme, this includes the Solar PV Sites (Lime Down A, B, C1, C2, D (BESS), E1 and E2), and the Cable Route Corridor. The ZoI is limited to the Order Limits as the Scheme has been designed to ensure there is no increase in flood risk within or downstream of the Solar PV Sites, nor any significant effects on water quality.

11.13.3 This section presents an assessment of cumulative effects between the Scheme and other proposed and committed plans and projects.

11.13.4 This assessment has been made with reference to the methodology and guidance set out in **ES Volume 1, Chapter 6: Environmental Impact Assessment Methodology [EN010168/APP/6.1]** and shortlist of cumulative plans and projects identified in **ES Volume 3, Appendix 21-1: Long List of In-Combination Effects and Cumulative Developments [EN010168/APP/6.3]**.

11.13.5 For individual receptors, this cumulative effect assessment identifies where the assessed effects of the Scheme could interact with effects arising from other plans and/or projects on a spatial and/or temporal basis.

11.13.6 Plans and projects identified from **ES Volume 3, Appendix 21-1: Long List of In-Combination Effects and Cumulative Developments [EN010168/APP/6.3]** of this ES which have the potential to result in cumulative effects on Hydrology, Flood Risk and Drainage are set out in **Table 11-10** and considered below. The remaining plans and projects were reviewed in relation to Hydrology, Flood Risk and Drainage receptors identified in this assessment and no further potential for cumulative effects are identified.

11.13.7 The following projects provided information relevant to surface water and drainage considerations. A number of cumulative schemes did not include detailed hydrological assessments or surface water management information and, as such, have not been included. However, the methodologies applied for the future baseline year consider allowances for climate change and cumulative impacts associated with permitted and allocated developments. Furthermore, no submitted scheme will be consented where there is the potential for detrimental impacts to offsite flood risk, ensuring that cumulative impacts will not be incurred. If additional hydrological information becomes available and

has the potential to affect the Study Area or the Scheme, it will be defined and included within a future addendum to the ES, if submitted during the Examination stage.

Table 11-10:Plans and projects relevant to Hydrology, Flood Risk and Drainage cumulative effects assessment

ID	Reference and Description	Distance from the Scheme	Potential Cumulative Effects
PL/2024/00865 (Under Consultation)	Residential development for 45 dwellings, vehicular and pedestrian access including- 45 dwellings	0.9 km from Lime Down C	No significant cumulative effects have been identified
PL/2021/10696 (Accepted with Conditions)	Proposed erection of a GP Surgery.	1.2 km from Lime Down A	No significant cumulative effects have been identified
PL/2024/03204 (Accepted with Conditions)	The erection of a new manufacturing and research and development centre	0.25 km (from Cable Route Corridor)	No significant cumulative effects have been identified
PL/2023/10560 (Under Consultation)	Outline planning permission for the development of up to 24- 24 dwellings	0.3 km (from Cable Route Corridor)	No significant cumulative effects have been identified
19/01490/FUL (Accepted with Conditions)	A Residential Development Comprising 31 Dwellings (Use Class C3), a- 31 Dwellings	0 km (edge of Cable Route Search Area)	No significant cumulative effects have been identified
20/10972/OUT (Accepted	Outline Planning Application for up to 71 Dwellings, Community Car- 71 Dwellings	0.6 km from Lime Down D	No significant cumulative effects have been identified

ID	Reference and Description	Distance from the Scheme	Potential Cumulative Effects
with Conditions)			
PL/2022/08742 (Approved with Conditions)	75 bed modular unit single living accommodation, with supporting kitchen	1.1 km from Lime Down E	No significant cumulative effects have been identified
18/08271/OUT (Approved with Conditions)	Outline planning application for up to 44,150 sq.m. (GIA)	0.8 km from Lime Down D	No significant cumulative effects have been identified
PL/2024/02998 (Under Consultation)	Development of site to provide 41No.residential (Use Class C3) units	0.5 km (from Cable Route Search Area)	No significant cumulative effects have been identified
PL/2022/06908 (Under Consultation)	Full Planning Application for 56 Dwellings, associated parking, public open- 56 Dwellings	0 km (from Cable Route Corridor)	No significant cumulative effects have been identified
PL/2022/06612 (Appeal Lodged Against Non-	Outline application for residential development of up to 70 dwellings- 70 dwellings	0.1 km (from Cable Route Corridor)	No significant cumulative effects have been identified

ID	Reference and Description	Distance from the Scheme	Potential Cumulative Effects
Determination)			
PL/2024/01560 (Under Consolation)	Laying a section of underground cable	0 km (from Cable Route Corridor)	No significant cumulative effects have been identified
PL/2023/06727 (Approved with Conditions)	Reserved Matters Application for 120 Dwellings	0.5 km (from Cable Route Corridor)	No significant cumulative effects have been identified
PL/2022/09253 (Approved with Conditions)	Installation of underground cable. (Enso Energy)	0 km (from Cable Route Corridor)	No significant cumulative effects have been identified
19/10628/FUL (Approved with Conditions)	The construction of a 10 MW Battery Storage Facility	0 km (adjacent to Cable Route Search Area)	No significant cumulative effects have been identified. While the Scheme is adjacent to the Cable Route Corridor, it is a standalone BESS facility with separate containment and drainage infrastructure. Any potential pollution risk or water demand associated with its operation is managed independently through its own embedded design controls. Water usage during operation is negligible and not expected to give rise to cumulative supply pressures. No cumulative pollution risks are anticipated, as both schemes incorporate pollution containment measures (including sealed drainage and isolation valves), and no shared watercourses or drainage infrastructure are proposed between them.
PL/2021/07610 (Approved	Development of a 20 MW battery storage facility	0.1 km (from Cable Route Corridor)	No significant cumulative effects have been identified. While the Scheme is adjacent to the Cable Route Corridor, it is a standalone BESS facility with separate containment and drainage infrastructure. Any potential pollution risk or

ID	Reference and Description	Distance from the Scheme	Potential Cumulative Effects
with Conditions)			water demand associated with its operation is managed independently through its own embedded design controls. Water usage during operation is negligible and not expected to give rise to cumulative supply pressures. No cumulative pollution risks are anticipated, as both schemes incorporate pollution containment measures (including sealed drainage and isolation valves), and no shared watercourses or drainage infrastructure are proposed between them.
20/08618/FUL (Approved with Conditions)	The installation of a 49.9 MW solar farm	4 km from Lime Down B	No significant cumulative effects have been identified
PL/2021/06100 (Approved with Conditions)	The installation of a 49.9 MW solar farm	3.6 km from Lime Down E	No significant cumulative effects have been identified
PL/2023/01914 (Status not Identified)	Proposed temporary planning permission for 40 years for the development of a solar farm of up to 24.14 MW	3.3 km (from Cable Route Corridor)	No significant cumulative effects have been identified
PL/2021/08690 (Approved with Conditions)	Installation of a solar farm and battery storage facility	0 km (from Cable Route Corridor)	No significant cumulative effects have been identified. While the Scheme is adjacent to the Cable Route Corridor, it is a standalone BESS facility with separate containment and drainage infrastructure. Any potential pollution risk or water demand associated with its operation is managed independently through its own embedded design controls. Water usage during operation is negligible and not expected to give rise to cumulative supply pressures. No cumulative pollution risks are anticipated, as both schemes incorporate pollution containment measures (including sealed drainage and isolation valves), and no shared watercourses or drainage infrastructure are proposed between them.

ID	Reference and Description	Distance from the Scheme	Potential Cumulative Effects
20/06517/SCR (Status Not Identified)	EIA Screening Opinion in relation to the Scheme of solar farm and associated development	3.3 km (from Cable Route Corridor)	No significant cumulative effects have been identified
19/06301/SCR (Status Not Identified)	EIA Screening request for proposed solar farm	0.1 km from Lime Down D	No significant cumulative effects have been identified
20/03528/FUL (Approved with Conditions)	Installation of a renewable led energy scheme	9 km from Lime Down E	No significant cumulative effects have been identified
20/05893/SCO (Under Consultation)	EIA screening/scoping opinion for installation of a solar farm	6 km from Lime Down B	No significant cumulative effects have been identified. While the Scheme is adjacent to the Cable Route Corridor, it is a standalone BESS facility with separate containment and drainage infrastructure. Any potential pollution risk or water demand associated with its operation is managed independently through its own embedded design controls. Water usage during operation is negligible and not expected to give rise to cumulative supply pressures. No cumulative pollution risks are anticipated, as both schemes incorporate pollution containment measures (including sealed drainage and isolation valves), and no shared watercourses or drainage infrastructure are proposed between them.
20/06840/FUL (Approved with Conditions)	Construction of a solar farm and battery storage facility	0 km (from Cable Route Corridor)	No significant cumulative effects have been identified. While the Scheme is adjacent to the Cable Route Corridor, it is a standalone BESS facility with separate containment and drainage infrastructure. Any potential pollution risk or water demand associated with its operation is managed independently through its own embedded design controls. Water usage during operation is negligible and not expected to give rise to cumulative supply pressures. No cumulative pollution risks are anticipated, as both schemes incorporate pollution containment

ID	Reference and Description	Distance from the Scheme	Potential Cumulative Effects
			measures (including sealed drainage and isolation valves), and no shared watercourses or drainage infrastructure are proposed between them.
PL/2023/10077 (Under Consultation)	Construction and operation of a renewable energy park	4.5 km from Lime Down E	No significant cumulative effects have been identified
CH1 - South West Chippenham (Rowden Park Site and Smaller Extension Sites)	Rowden Park comprises 1,000 dwellings, 18 hectares of employment land	Adjacent to Cable Route Search Area	No significant cumulative effects have been identified
CP35 - Methuen Park	Principal Employment Area (WCS) for B1, B2 and B8 Use	Adjacent to Cable Route Search Area	No significant cumulative effects have been identified
PL/2025/03530- Kingway Nurseries	Full planning application for the demolition of the remaining horticultural nurseries and erection of employment facilities comprising office and product development premises (Class E) and warehouse and light industrial facilities (Class B2 and B8).	Falls within the 2 km boundary and is 300 m from the Order Limits	No significant cumulative effects have been identified
PL/2025/02785-	EIA Screening Opinion for Proposed Battery Energy	Falls within the preferred Cable Route Search	No significant cumulative effects have been identified. While the Scheme is adjacent to the Cable Route Corridor, it is a standalone BESS facility with separate containment and drainage infrastructure. Any potential pollution risk or

ID	Reference and Description	Distance from the Scheme	Potential Cumulative Effects
Land at Neston Park Estate	Storage System and Associated Infrastructure	Areas and is 550 m from the Order Limits	water demand associated with its operation is managed independently through its own embedded design controls. Water usage during operation is negligible and not expected to give rise to cumulative supply pressures. No cumulative pollution risks are anticipated, as both schemes incorporate pollution containment measures (including sealed drainage and isolation valves), and no shared watercourses or drainage infrastructure are proposed between them.

Cumulative Effects

11.13.8 There is potential for overlap between construction of adjacent schemes and construction of this Scheme. Thus, there is the potential for short term, temporary construction related pollutants generated from both the Scheme and adjacent developments to impact on watercourses in the Site. However, provided that standard and good practice mitigation is implemented on the construction sites through their respective CEMP and as per the conditions of the relevant planning permission, environmental permits and licences, as is being proposed for this Scheme, the cumulative risk can be effectively managed and there would not be a significant increase in the risks to any waterbodies. As such, there would not be any significant cumulative effects anticipated during construction on the basis of the above assessment.

11.13.9 All relevant developments will be required to be supported by drainage strategies with reference to the relevant policies and guidance documents. In some instances, the developments may not be at the application stage, however, it must be assumed they will be supported by appropriate flood risk assessments and drainage strategies in line with relevant guidance and good practice. The Scheme assessed in this chapter will similarly be designed to ensure no long-term deterioration in water quality or increase in flooding. Attenuation and treatment will be provided where necessary for runoff from the Scheme prior to discharge to waterbodies or ground. As such, provided that all the mitigation measures are implemented for all schemes, then the cumulative impacts from the Scheme and any cumulative schemes are not anticipated to produce any significant effects.

In-Combination Effects

11.13.10 In-combination cumulative effects are those where impacts from two or more environmental disciplines are considered likely to result in a new or different likely significant effect, or an effect of greater significance, than any one of the impacts on their own. The identified in-combination effects are set out within **ES Volume 1, Chapter 21 Cumulative and In-Combination Effects [EN010168/APP/6.1]**.

11.13.11 The assessment presented in this chapter has already considered impacts to hydrology, flood risk and drainage from climate change which may increase the potential for more frequent and intense rainfall events.

11.13.12 No in-combination effects alongside hydrology, flood risk and drainage have been identified as a result of the Scheme.

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