Lime Down

Solar Park

Environmental Statement

Volume 3, Appendix 11-1: Flood Risk Assessment and Drainage Strategy Lime Down Covering Report (Tracked)

~~May~~ June 2026

Revision 3~~2~~

Planning Inspectorate Reference: EN010168

Document Reference: APP/6.1

APFP Regulation 5(2)(a)

Appendix 11-1: Flood Risk Assessment and Drainage Strategy – Lime Down Covering Report

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Date: ~~17/03/2026~~15/06/2026

Document Ref: 317212-01

~~Issue-02~~

Issue-03

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Reference of Terms

Annual Exceedance Probability (AEP)

The AEP is the chance or probability of a natural hazard event (usually a rainfall or flooding event) occurring annually and is usually expressed as a percentage.

Aquifers

- Principal Aquifers are layers of rock or drift deposits that have high intergranular and/or fracture permeability - meaning they usually provide a high level of water storage. They may support water supply and/or river base flow on a strategic scale.
- Secondary A Aquifers are 'permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. These are generally aquifers formerly classified as minor aquifers.'
- Secondary B Aquifers are 'predominantly lower permeability layers which may store and yield limited amounts of groundwater due to localised features such as fissures, thin permeable horizons, and weathering. These are generally the water-bearing parts of the former non-aquifers.'
- Secondary Undifferentiated Aquifers are assigned in 'cases where it has not been possible to attribute either category A or B to a rock type. In most cases, this means that the layer in question has previously been designated as both minor and non-aquifer in different locations due to the variable characteristics of the rock type.'
- Unproductive Strata are 'rock layers or drift deposits with low permeability that have negligible significance for water supply or river base flow.'

Canal Failure

Canal failure can occur due to high-intensity rainfall or structural failure and can be dangerous due to the rapid release of large volumes of water. It is typically limited to raised canal reaches and can result in a rapid peak in flow followed by a gradual reduction.

Climate Change (CC)

A change in global or regional climate patterns. For flood risk, CC are assessed in terms of allowances which are predictions of anticipated change for peak river flow, peak rainfall intensity, sea level rise and offshore wind speed and extreme wave height. CC scenario data exists across different epochs (time periods) to determine the needs for climate resilience measures. CC data is requested as part of an EAPD request. If a separate ESG Flood Risk and CC Assessment is needed, additional CC data will be required.

Environment Agency (EA) and EA Product Data (EAPD)

The EA is the lead organisation for providing flood and coastal risk management and warnings of flooding from Main Rivers and on the coast. For sites within or in close elevational proximity to Flood Zone 2 or Flood Zone 3, EAPD is ordered to obtain more detailed flood risk data such as flood depths, breach and overtopping mapping and fluvial/tidal risks associated with CC.

Fluvial Flooding

Fluvial flooding typically occurs when a river's capacity is exceeded, and the excess water overtops the riverbanks. It can also occur when the watercourse has a high level downstream, perhaps due to structures or blockage, thus limiting conveyance. This creates a backup of water which can overtop the banks. Typical flooding issues occur when the natural floodplain has been urbanised, and the river has been confined. EA mapping defines three zones of different flood risk, the third of which is subdivided into two categories:

- Zone 1 "Low probability of flooding" – This zone comprises land assessed as having a less than 1 in 1,000 annual probability of river or sea flooding (<0.1%);
- Zone 2 "Medium probability of flooding" – This zone comprises land assessed as having between a 1 in 100 and 1 in 1,000 annual probability of river flooding (1% – 0.1%), or between a 1 in 200 and 1 in 1,000 annual probability of sea flooding (0.5% – 0.1%) in any year;
- Zone 3a "High probability of flooding" – This zone comprises land assessed as having a 1 in 100 or greater annual probability of river flooding (>1%), or a 1 in 200 or greater annual probability of flooding from the sea (>0.5%) in any year; and
- Zone 3b "Functional floodplain" – A sub-part of Zone 3, this zone comprises land where water has to flow or be stored in times of flood. This zone is not normally included within the national Flood Map for Planning and is calculated where necessary using detailed hydraulic modelling.

Groundwater Flooding

Groundwater flooding is caused by the emergence of water from beneath the ground at either point or diffuse locations when the natural level of the water table rises above ground level. This can result in deep and long-lasting flooding of low-lying or below-ground infrastructure such as underpasses and basements. Groundwater flooding can cause significant damage to property, especially in urban areas, and can pose further risks to the environment and ground stability.

Sewer Flooding

Flooding from sewers primarily occurs when flow entering a system exceeds available capacity or if the network capacity has been reduced through blockage or collapse. In the case of surface water sewers that discharge to watercourses, the same effect can be caused as a result of high-water levels in the receiving watercourse. As a result, water can begin to surcharge the sewer network, emerging at ground level through gullies and manholes and potentially causing flooding to highways and properties. If this occurs flooding can represent a significant hazard to human health due to the potential for contaminants in flood water.

Source Protection Zones

Source Protection Zones (SPZs) are areas of land through which water infiltrates into a groundwater borehole, well or spring that is used for public drinking water supply. These zones show the risk of contamination from potential pollution. SPZ's have been created as public facing boundaries where discrete groundwater bodies within SPZ's have been dissolved on zone number where common boundaries and overlaps have been removed. SPZs are defined around large and public potable groundwater abstraction sites. The purpose of SPZs is to provide additional protection to safeguard drinking water quality through constraining the proximity of an activity that may impact upon a drinking water abstraction.

- Zone 1 (Inner Protection Zone) is defined by a travel time of 50-days or less from any point within the zone at, or below, the water table. Additionally, the zone has as a minimum a 50-metre radius.
- Zone 2: (Outer Protection Zone) - This zone is defined by the 400-day travel time from a point below the water table. Additionally, this zone has a minimum radius of 250 or 500 metres, depending on the size of the abstraction.
- Zone 3: (Total catchment) - This zone is defined as the total area needed to support the abstraction or discharge from the protected groundwater source. A further Zone 4, or 'Zone of Special Interest' was previously defined for some groundwater sources.

Surface Water Runoff

Surface water runoff is defined as water flowing over the ground that has not yet entered a drainage channel or similar. It usually occurs because of an intense period of rainfall which exceeds the infiltration capacity of the ground. Typically, runoff occurs on sloping land or where the ground surface is relatively impermeable.

The ground can be impermeable either naturally due to the soil type or geology, or due to development which places impervious material over the ground surface (e.g. paving and roads).

Tidal Flooding

Tidal flooding is caused by high tides coinciding with a low-pressure storm system which raises sea and tidal water levels, overwhelming coastal and river defences. This may be made worse by gale-force winds blowing the raised body of water up tidal river basins some distance from the coast, due to floodwater being forced up the tidal reaches of rivers and estuaries. Such flooding may become more frequent in future years due to rising sea levels.

Reservoirs Failure

Reservoir failure can be a particularly dangerous form of flooding as it results in the sudden release of large volumes of water that can travel at high velocity, causing deep and widespread flooding. The likelihood of this occurring is low as large reservoirs are managed in accordance with the Reservoirs Act 1975. The EA's online reservoir inundation map illustrates the maximum flood extents that could occur in the event of a reservoir.

1. Introduction

1.1 The Scheme

1.1.1 On the Environment Agency (EA) Flood Map for Planning[i], the Scheme is shown to be located mainly within Flood Zone 1, however, Lime Down B, C, D, E and the Cable Route Search Corridor are shown to be encroached by Flood Zones 2 and 3. Additionally, the Scheme is in excess of 1 hectare (ha) and therefore, the application requires a Flood Risk Assessment and Sustainable Drainage Strategy to support the Development Consent Order (DCO) application in line with the National Policy Statement (NPS) for Energy (EN-1)[ii], Renewable Energy Infrastructure (EN-3)[iii] and Electricity Networks Infrastructure (EN-5)[iv].

1.1.2 The Scheme comprises a number of Fields which make up the "Site" or "Sites" described as Lime Down A, B, C, D and E which contain the Solar PV Panels, grid connection infrastructure and Battery Energy Storage System (BESS); there is also a Cable Route Corridor. For the purpose of this assessment, Lime Down C and E have both been split into two separate Sites (C1, C2, E1 and E2), which is due to a railway line running between the Sites. The assessment of the Cable Route Corridor between Sites (including interconnecting cables) has been included as part of **ES Volume 3, Appendix 11-9: Flood Risk Assessment and Drainage Strategy - Lime Down Cable Route Corridor [EN010168/APP/6.3]**.

1.1.3 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.

1.1.4 Where a Site is made up of multiple Fields these have been labelled as "Field [X]" in accordance with Field numbering plans as shown on **ES Volume 2, Figure 2-2: Field Boundaries and Numbering [EN010168/APP/6.2]**. It should be noted that the assessments of these Sites will be based on the Field Boundaries and not the overall Site Boundary. The Scheme comprises the following Fields where assessments of each area have been undertaken:

- Lime Down A is subdivided into 12 Fields (A1 – A12);
- Lime Down B is subdivided into 7 Fields (B6 – B12);
- Lime Down C1 is subdivided into 18 Fields (C1, C5 – C8, C12, C19, C21 – C23, C29 – C36);
- Lime Down C2 is subdivided into 8 Fields (C9 – C11, C14 – 18);
- Lime Down D is subdivided into 24 Fields (D1 – D24);
- Lime Down E1 is subdivided into 6 Fields (E1 – E4, E6 – E7);
- Lime Down E2 is subdivided into 24 Fields (E9 – E15, E17 – E29, E31 – E34); and
- Cable Route Corridor (Field numbers not available).

1.1.5 The proposed substation parameters for each Site are described below; however, final electrical design will be finalised at the detailed design stage post-submission.

- Lime Down A = 132kV substation;
- Lime Down C = 132kV substation;
- Lime Down D = 132kV substation, 400kV substation and BESS; and
- Lime Down E = 132kV substation.

1.2 Requirements for Assessment

1.2.1 The aim of this report is to assess the potential flood risk to the Scheme, the impact of the Scheme on flood risk elsewhere, and the proposed measures which would be incorporated to mitigate the identified risk. This appendix has been prepared in accordance with the guidance contained in the Overarching National Policy Statement for Energy (NPS EN-1) (November 2023), the National Planning Policy Framework (NPPF)[v] revised in December 2024, and the National Planning Practice Guidance (NPPG)[vi] Flood Risk and Coastal Change.

1.2.2 Wiltshire Council in its role as Lead Local Flood Authority (LLFA) is the regulatory authority and statutory consultee for major planning applications in relation to surface water drainage, requiring that where there is 10 or more dwellings or floor space greater than 1,000m^2, a Drainage Strategy needs to be attained. The aim of the Drainage Strategy is to identify water management measures, including Sustainable Drainage Systems (SuDS) to provide surface water runoff reduction and treatment.

1.2.3 This appendix considers the following national and local policies:

- Overarching National Policy Statement for Energy (EN-1) (2023);
- National Policy Statement for Renewable Energy Infrastructure (EN-3) (2023);
- National Policy Statement for Electricity Networks Infrastructure (EN-5) (2023);
- National Planning Policy Framework (NPPF) (2024);
- National Planning Practice Guidance (NPPG) (2022);
- CIRIA Guidance: The SuDS Manual (C753) (2017)[vii];
- Wiltshire Council Local Flood Risk Management Strategy[viii]; and
- Wiltshire Borough Council Local Development and Planning Policies, including the Wiltshire Core Strategy[ix].

1.2.4 Emerging Local Plans:

- Wiltshire Local Plan Review (2024)[x].

1.3 Sources of Information

1.3.1 The following sources of information have been reviewed and assessed for the purpose of this assessment:

- EA Flood Map for Planning;
- EA Long Term Flood Risk Maps[xi];

- British Geological Society (BGS) Interactive Map[xii]; and
- MAGIC Interactive Map[xiii].

2. Relevant Planning Policy and Guidance

2.1 Introduction

2.1.1 The aim of this section of the appendix is to discuss the main aspects of the local and national planning policies and relevant guidance and legislation that are relevant to the Scheme.

2.2 Assessment of Flood Risk

Overarching NPS for Energy (EN-1)

2.2.1 NPS EN-1, Paragraph 5.8.13, requires Site-specific flood risk assessments for all energy projects located in Flood Zones 2 and 3 in England. For projects located in Flood Zone 1, an assessment is required for all proposals that involve:

- Sites of 1 hectare of more;
- Land which has been identified by the Environment Agency as having critical drainage problems;
- Land identified (for example in a local authority strategic flood risk assessment) as being at increased flood risk in future;
- Land that may be subject to other sources of flooding (for example surface water); and
- Where the Environment Agency or Natural Resources Wales, Lead Local Flood Authority, Internal Drainage Board, or other body have indicated that there may be drainage problems.

2.2.2 Paragraph 5.8.15 provides the minimum requirements for flood risk assessments. They should:

- Be proportionate to the risk and appropriate to the scale, nature, and location of the project;
- Consider the risk of flooding arising from the project in addition to the risk of flooding to the project;
- Take the impacts of climate change into account, across a range of climate scenarios, clearly stating the development lifetime over which the assessment has been made;
- Be undertaken by competent people, as early as possible in the process of preparing the proposal;
- Consider both the potential adverse and beneficial effects of flood risk management infrastructure, including raised defences, flow channels, flood storage areas and other artificial features, together with the consequences of their failure and exceedance;
- Consider the vulnerability of those using the Site, including arrangements for safe access and escape;
- Consider and quantify the different types of flooding (whether from natural and human sources and including joint and cumulative effects) and include information on flood likelihood, speed-of-onset, depth, velocity, hazard, and duration;
- Identify and secure opportunities to reduce the causes and impacts of flooding overall, making as much use as possible of natural flood management techniques as part of an integrated approach to flood risk management;
- Consider the effects of a range of flooding events including extreme events on people, property,

the natural and historic environment and river and coastal processes;

- Include the assessment of the remaining (known as 'residual') risk after risk reduction measures have been taken into account and demonstrate that these risks can be safely managed, ensuring people will not be exposed to hazardous flooding; consider how the ability of water to soak into the ground may change with development, along with how the proposed layout of the project may affect drainage systems. Information should include:
  i. Describe the existing surface water drainage arrangements for the Site;
  ii. Set out (approximately) the existing rates and volumes of surface water run-off generated by the Site. Detail the proposals for restricting discharge rates;
  iii. Set out proposals for managing and discharging surface water from the Site using sustainable drainage systems and accounting for the predicted impacts of climate change. If sustainable drainage systems have been rejected, present clear evidence of why their inclusion would be inappropriate;
  iv. Demonstrate how the hierarchy of drainage options has been followed;
  v. Explain and justify why the types of SuDS and method of discharge have been selected and why they are considered appropriate;
  vi. Explain how sustainable drainage systems have been integrated with other aspects of the development such as open space or green infrastructure, so as to ensure an efficient use of the Site;
  vii. Describe the multifunctional benefits the sustainable drainage system will provide;
  viii. Set out which opportunities to reduce the causes and impacts of flooding have been identified and included as part of the proposed sustainable drainage system;
  ix. Explain how run-off from the completed development will be prevented from causing an impact elsewhere;
  x. Explain how the sustainable drainage system been designed to facilitate maintenance and, where relevant, adoption. Set out plans for ensuring an acceptable standard of operation and maintenance throughout the lifetime of the development;
  xi. detail those measures that will be included to ensure the development will be safe and remain operational during a flooding event throughout the development's lifetime without increasing flood risk elsewhere;
  xii. identify and secure opportunities to reduce the causes and impacts of flooding overall during the period of construction; and
  xiii. be supported by appropriate data and information, including historical information on previous events.

2.2.2 The main objectives of the FRA, considering NPS EN-1 above, are to:

- Consider all sources of flooding such as coastal, fluvial, and surface water flooding. Ensure flood depths, velocity, hazard, and duration have been considered;
- Establish the risk of flooding in relation to the Scheme;
- Consider the adverse and beneficial impacts of the Scheme;
- Establish safe access and egress and ensure the Scheme is operationally safe;
- Consider extreme events and how climate change may impact each Site and surrounding people/properties;

- Suggest appropriate flood mitigation measures for the Scheme; and
- Provide supporting data and detailed reports for the Scheme.

2.2.3 Paragraphs 5.8.6, 5.8.9 – 5.8.12, and 5.8.21 – 5.8.23 from the NPS EN-1 relevantly provide that:

2.2.4 Paragraph 5.8.6 – "The aims of planning policy on development and flood risk are to ensure that flood risk from all sources of flooding is taken into account at all stages in the planning process to avoid inappropriate development in areas at risk of flooding, and to steer new development to areas with the lowest risk of flooding."

2.2.5 Paragraph 5.8.9 – "If, following application of the Sequential Test, it is not possible, (taking into account wider sustainable development objectives), for the project to be located in areas of lower flood risk the Exception Test can be applied, as required by Annex 3 of the Planning Practice Guidance. The test provides a method of allowing necessary development to go ahead in situations where suitable sites at lower risk of flooding are not available."

2.2.6 Paragraph 5.8.10 – "The Exception Test is only appropriate for use where the Sequential Test alone cannot deliver an acceptable site. It would only be appropriate to move onto the Exception Test when the Sequential Test has identified reasonably available, lower risk sites appropriate for the proposed development where, accounting for wider sustainable development objectives, application of relevant policies would provide a clear reason for refusing development in any alternative locations identified. Examples could include alternative site(s) that are subject to national designations such as landscape, heritage and nature conservation designations, for example Areas of Outstanding Natural Beauty (AONBs), Sites of Special Scientific Interest SSSIs and World Heritage Sites (WHS) which would not usually be considered appropriate."

2.2.7 Paragraph 5.8.11 – "Both elements of the Exception Test will have to be satisfied for development to be consented. To pass the Exception Test it should be demonstrated that:

- The project would provide wider sustainability benefits to the community that outweigh flood risk; and
- The project will be safe for its lifetime taking account of the vulnerability of its users, without increasing flood risk elsewhere, and, where possible will reduce flood risk overall."

2.2.8 Paragraph 5.8.12 – "Development should be designed to ensure there is no increase in flood risk elsewhere, accounting for the predicted impacts of climate change throughout the lifetime of the development. There should be no net loss of floodplain storage, and any deflection or constriction of flood flow routes should be safely managed within the site. Mitigation measures should make as much use as possible of natural flood management techniques."

2.2.9 Paragraph 5.8.21 – "The Sequential Test ensures that a sequential, risk-based approach is followed to steer new development to areas with the lowest risk of flooding, taking all sources of flood risk and climate change into account. Where it is not possible to locate development in low-risk areas, the Sequential Test should go on to compare reasonably available sites with medium risk areas and then, only where there are no reasonably available sites in low and medium risk areas, within high-risk areas."

2.2.10 Paragraph 5.8.22 – "The technology specific NPSs set out some exceptions to the application of the Sequential Test. However, when seeking development consent on a site allocated in a development plan through the application of the Sequential Test, informed by a strategic flood risk assessment, applicants need not apply the Sequential Test, provided the proposed development is consistent with the use for which the site was allocated and there is no new flood risk information that would have affected the outcome of the test."

2.2.11 Paragraph 5.8.23 – "Consideration of alternative sites should take account of the policy on alternatives set out in Section 4.2 above. All projects should apply the Sequential Test to locating development within the site."

2.2.12 Paragraphs 5.8.24 – 5.8.35 relevantly provide guidance on mitigation and are summarised below:

2.2.13 Paragraph 5.8.24 – To manage surface water flood risk, arrangements are required to manage impact on the water cycle and/or people/property.

2.2.14 Paragraph 5.8.25 – Sustainable approaches to management include:

- Rainwater recycling and drainage;
- Infiltration/soakaways;
- Filter strips and swales;
- Permeable surfacing; and
- Basins, ponds, and tanks.

2.2.15 Paragraph 5.8.26 – Sites should cope with events that exceed design capacity.

2.2.16 Paragraph 5.8.27 – Climate change should be considered for the developments lifetime, and the peak flow rates should be no greater than the rates prior to development, unless arrangements made.

2.2.17 Paragraph 5.8.28 – Surface water storage and infiltration may be necessary to limit peak rate of discharge and total volume discharged.

2.2.18 Paragraph 5.8.29 – Sequential test should be applied, and vulnerable aspects of the Site should be located in lower risk areas. Space should be utilised for multiple purposes such as amenity and biodiversity.

2.2.19 Paragraph 5.8.30 – Where there is an increase in flood risk. Level-for-level compensation should be provided, and it should account for climate change over the lifetime design.

2.2.20 Paragraph 5.8.31 – Where there is deflection of flood routes, these will be safely managed.

2.2.21 Paragraph 5.8.32 – Where flood risk increases elsewhere, multifunctional Sustainable Drainage Systems, natural flood management and green infrastructure could be beneficial.

2.2.22 Paragraph 5.8.33 – Warnings of floods are essential, and Flood Response Plans should be provided if needed.

2.2.23 Paragraph 5.8.34 – Any emergency documents, flood warning and evacuation procedures should be in the FRA.

2.2.24 Paragraph 5.8.35 – Flood resistant/resilient materials should be adopted for minimum damage and recovery.

NPS for Renewable Energy Infrastructure (EN-3)

2.2.25 Paragraphs 2.10.84 – 2.10.88 relevantly provide that:

- Paragraph 2.10.84 – "Where a Flood Risk Assessment has been carried out this must be submitted alongside the applicant's ES. This will need to consider the impact of drainage. As solar panels will drain to the existing ground, the impact will not, in general, be significant."
- Paragraph 2.10.85 – "Where access tracks need to be provided, permeable tracks should be used, and localised Sustainable Drainage Systems (SuDS), such as swales and infiltration trenches, should be used to control any run-off where recommended."
- Paragraph 2.10.86 – "Given the temporary nature of solar PV farms, sites should be configured or selected to avoid the need to impact on existing drainage systems and watercourses."
- Paragraph 2.10.87 – "Culverting existing watercourses/drainage ditches should be avoided."
- Paragraph 2.10.88 – "Where culverting for access is unavoidable, applicants should demonstrate that no reasonable alternatives exist and where necessary it will only be in place temporarily for the construction period."

NPS for Electricity Networks Infrastructure (EN-5)

2.2.26 Paragraphs 2.3.2 and 2.3.3 relevantly provide that:

- As climate change is likely to increase risks to the resilience of some of this infrastructure, from flooding for example, or in situations where it is located near the coast or an estuary or is underground, applicants should in particular set out to what extent the proposed development is expected to be vulnerable, and, as appropriate, how it has been designed to be resilient to:
    - Flooding, particularly for substations that are vital to the network; and especially in light of changes to groundwater levels resulting from climate change;
    - The effects of wind and storms on overhead lines;
    - Higher average temperatures leading to increased transmission losses;
    - Earth movement or subsidence caused by flooding or drought (for underground cables); and
    - Coastal erosion – for the landfall of offshore transmission cables and their associated substations in the inshore and coastal locations, respectively.

2.2.27 Section 4.9 of EN-1 advises that the resilience of the project to the effects of climate change must be assessed in the Environmental Statement (ES) accompanying an application. For example, future increased risk of flooding would be covered in any flood risk assessment (see Sections 5.8 in EN-1).

Planning Practice Guidance accompanying the National Planning Policy Framework (NPPF) and Planning Practice Guidance

2.2.28 The Planning Practice Guidance: Flood Risk and Coastal Change (PPG)[xiv] that accompanies the NPPF is referred to by NPS EN-1 as providing further guidance for carrying out a Flood Risk Assessment.

Flood Risk

2.2.29 The assessment of flood risk is based on the definitions of Flood Zones in Table 2-1 of the PPG, and these zones are shown on the EA Flood Map for Planning (flood risk from rivers or the sea):

- Zone 1 "Low probability of flooding" – This zone comprises land assessed as having a less than 1 in 1,000 annual probability of river or sea flooding (<0.1%);
- Zone 2 "Medium probability of flooding" – This zone comprises land assessed as having between a 1 in 100 and 1 in 1,000 annual probability of river flooding (1% – 0.1%), or between a 1 in 200 and 1 in 1,000 annual probability of sea flooding (0.5% – 0.1%) in any year;
- Zone 3a "High probability of flooding" – This zone comprises land assessed as having a 1 in 100 or greater annual probability of river flooding (>1%), or a 1 in 200 or greater annual probability of flooding from the sea (>0.5%) in any year; and
- Zone 3b "Functional floodplain" – A sub-part of Zone 3, this zone comprises land where water has to flow or be stored in times of flood. This zone is not normally included within the national Flood Map for Planning and is calculated where necessary using detailed hydraulic modelling.

2.2.30 NPS EN-1 requires that developers consider the flood risk to the development from all sources of flooding, which include surface water, groundwater, Ordinary Watercourses, artificial drainage systems, canals, and reservoirs.

Vulnerability Classification

2.2.31 Annex 3 of the NPPF, referred to by the flood risk and coastal change guidance, classifies the Flood Risk Vulnerability of various land uses. Solar Schemes are specifically identified and are classified as 'Essential Infrastructure.' Development of each classification is permitted, not permitted, or permitted only if the Exception Test is passed, as set out in Table 2 of the Annex and duplicated in Table 1.

Table 1: Flood Risk Vulnerability Classification (from Table 2 of online Planning Practice Guidance)

Flood Zones	Flood Risk Vulnerability Classification				
	Essential Infrastructure	Highly Vulnerable	More Vulnerable	Less Vulnerable	Water-Compatible
Zone 1	✓	✓	✓	✓	✓
Zone 2	✓	Exception Test Required	✓	✓	✓
Zone 3a	Exception Test Required	✗	Exception Test Required	✓	✓

Zone 3b	Exception Test Required	✗	✗	✗	✓

✓ development is permitted

✗ development is not permitted

2.2.32 'Essential Infrastructure' development is considered appropriate within Flood Zones 1 and 2 and, provided the Exception Test is satisfied, for development within Flood Zone 3.

Sequential Test

2.2.33 Paragraph 023 (Reference ID: 7-023-20220825) of the Planning Practice Guidance: Flood Risk and Coastal Change, states that the sequential approach directs development to areas with the lowest flood risk, prioritising areas with little or no risk, such as Flood Zone 1, and avoiding higher-risk areas wherever possible. This includes considering all types of flooding, such as surface water. The "Sequential Test" ensures that new developments are located in areas with the lowest probability of flooding, and only where there are no reasonable alternative Sites available can areas with a higher risk of flooding be considered, subject to passing the Exception Test. Even if flood risk assessments demonstrate that a development can be made safe, the sequential test must still be satisfied to ensure sustainable development and avoid promoting unsuitable Sites.

Exception Test

2.2.34 EN-1 confirms, at Paragraph 5.8.10. that the Exception Test is only appropriate for use where the Sequential Test alone cannot deliver an acceptable Site. This may be because the alternative Sites identified are subject to national designations such as Areas of Outstanding Natural Beauty, meaning they would not usually be considered appropriate. The Exception Test determines whether the benefits of the Scheme will outweigh the potential flood risk. Paragraph 5.8.11 advises that both elements of the Exception Test have to be satisfied for development to be consented. To pass the Exception Test, it should be demonstrated that:

- The project would provide wider sustainability benefits to the community that outweigh flood risk; and
- The project will be safe for its lifetime taking account of the vulnerability of its users, without increasing flood risk elsewhere, and, where possible, will reduce flood risk overall.

2.2.35 **ES Volume 3, Appendices 11.2 to 11.9: FRA and Drainage Strategy [EN010168/APP/6.3]** provide specific flood risk assessments for each of the Sites and the Cable Route Corridor and, where relevant, identify the mitigation measures which required to ensure that the developments remain safe for their lifetime, avoid increasing flood risk elsewhere, and may reduce flood risk overall. The Sequential and Exception Tests are considered further in Section 7.

2.3 Local Policy

Core Policy 67: Flood Risk

2.3.1 Wiltshire Council Core Strategy[xv], adopted in 2015, contains the following policies relating to flood risk and drainage:

"Development proposed in Flood zones 2 and 3 as identified within the Strategic Flood Risk Assessment will need to refer to the Strategic Housing Land Availability Assessment when providing evidence to the local planning authority in order to apply the sequential test in line with the requirements of national policy and established best practice.

All new development will include measures to reduce the rate of rainwater run-off and improve rainwater infiltration to soil and ground (sustainable urban drainage) unless site or environmental conditions make these measures unsuitable."

Wiltshire Council Strategic Flood Risk Assessment and Wiltshire SuDS Supplementary Planning Document

2.3.2 In addition to the above, regard has been had to the Wiltshire Council Strategic Flood Risk Assessment Level 1 and the emerging Wiltshire SuDS Supplementary Planning Document. These documents have informed the approach to sustainable drainage design, runoff control, biodiversity integration and local flood risk management within the Scheme.

2.4 Climate Change

2.4.1 NPS EN-1 confirms the need to factor the effects of climate change into any Flood Risk Assessment. Paragraph 4.10.13 advises that the latest UK Climate Projections and associated research and expert guidance (such as the EA's 'Flood Risk Assessments: Climate Change Allowances' Guidance (February 2016; last updated May 2022)[xvi] should be used to ensure appropriate mitigation or adaptation measures are identified to cover the estimated lifetime of the Scheme. The EA Guidance provides climate change allowances (predictions of anticipated change), and those relevant to the Scheme are the allowances for:

- Peak river flow; and
- Peak rainfall intensity.

2.4.2 Peak river flow allowances show the anticipated changes to peak flow by management catchment. Management catchments are sub-catchments of river basin districts. The range of allowances is based on percentiles. A percentile describes the proportion of possible scenarios that fall below an allowance level. The 50th percentile is the point at which half of the possible scenarios for peak flow fall below it, and half fall above it.

2.4.3 The percentiles for each allowance are:

- Central allowance is based on the 50th percentile;
- Higher central allowance is based on the 70th percentile; and
- Upper end allowance is based on the 95th percentile.

2.4.4 An allowance based on the 50th percentile is exceeded by 50% of the projections in the range. At the

70th percentile it is exceeded by 30%. At the 95th percentile it is exceeded by 5%.

2.4.5 The EA Guidance states that Essential Infrastructure Developments should utilise the Higher Central Allowance. However, NPS EN-1 Paragraph 4.10.11 states that "*where it is appropriate to apply a credible maximum scenario, the upper end allowance should be utilised*". Given that the credible maximum scenario applies to NSIPs, the NPS therefore requires that the Scheme uses the credible maximum scenario to remain resilient.

2.4.6 The Scheme is located in the Avon Bristol and North Somerset Streams Management Catchment[xvii]. Table 2 overleaf provides the Upper Allowances for the provided 2050's and 2080's epochs. The EA define the 2050's epoch as 2040 to 2069 and the 2080's epoch as 2070 to 2125. The life expectancy of the Scheme is 60 years therefore the allowances up to 2080 are detailed below.

Table 2: Peak River Flow – Upper Allowances (2050's and 2080's epoch)

	Higher Central Allowance		Upper End Allowance	
District Management Catchment	**2050s**	**2080s**	**2050s**	**2080s**
Severn Avon Bristol and North Somerset Streams	19%	39%	38%	71%

2.4.7 The Guidance further confirms that the appropriate allowance to assess off-site impacts is the central allowance, where the affected area contains essential infrastructure, the higher central allowance should be used. For essential infrastructure developments, hydraulic modelling should also use the upper end allowance as the credible maximum scenario.

2.4.8 For peak rainfall intensity, the peak rainfall allowances map shows the anticipated changes in peak rainfall intensity. These changes are to be used for site-scale applications, such as drainage design, and for surface water flood mapping in small catchments of less than 5 square kilometres (500 hectares).

Table 3: Peak Rainfall – Upper Allowances (2050's and 2070's epoch)

	Central Allowance		Upper End Allowance	
District Management Catchment	**2050s**	**2070s**	**2050s**	**2070s**
Severn Avon Bristol and North Somerset Streams	25%	25%	40%	45%

2.4.9 Climate change allowances have been integrated into our assessment as follows:

- EA Product Data has been provided. As the fluvial modelling available for the area was derived from JFLOW Generalised Modelling, the EA's surface water mapping was utilised as a proxy, with Manning's Open Channel Flow equations undertaken in these areas to further confirm the suitability of the EA's surface water mapping – this is applicable to Lime Down A, B, C1, D, E1, and E2. The Manning's calculations utilised the 1 in 1000-year present day extents with an uplift for climate change on flows. This method is considered suitable given the rural nature of the catchment area and the sensitivity of the Scheme.

- Additional hydraulic modelling undertaken at Lime Down D for a more detailed assessment of Gauze Brook, which is shown to have impact on the developable areas of Lime Down D within the online mapping. Small tributaries present in Lime Down D have not been included in the modelling due to their small catchment sizes. However, these small tributaries have been accounted for within the Manning's calculations, to prove any flood risk from the tributaries is minimal.
- Site-specific drainage strategies have been produced for Lime Down D, which includes 132Kv and 400 kV substations and a BESS Area. For Lime Down D, surface water runoff rates and the required attenuation volumes have been calculated using the EA peak rainfall intensity allowances to ensure compliance with climate change scenario.

3. Assessment of Flood Risk

3.1.1 The aim of this appendix is to assess the potential flood risk to the Scheme, the impact of the Scheme on flood risk elsewhere, and the proposed measures which could be embedded to mitigate the identified risk.

Methodology

3.1.2 This appendix outlines a generalised methodology for assessing flood risk, recognising that different forms of flooding require tailored approaches. The methodologies applied vary depending on the type of flood risk, available data, and local conditions. These include assessments of fluvial, surface water, groundwater, and other relevant flood risks. Detailed methodologies used for each source of flood risk are provided in the relevant sections of the Appendices, ensuring a comprehensive and site-specific assessment.

3.1.3 Specific assessments of Flood Risk for each Site and Cable Route Corridor have been provided in **ES Volume 3, Appendices 11.2 to 11.9: FRA and Drainage Strategy [EN010168/APP/6.3]**.

3.1.4 A summary of the assessed flood risk to the Sites is provided as Table 4 below:

Table 4: Summary of Risk for each Site

Site	Current Risk without Mitigation
Lime Down A	The risk to the Site from all sources of flooding is **Negligible to Low.**
Lime Down B	The risk to the Site from all sources of flooding is **Negligible to Low.**
Lime Down C1	The risk to the Site from all sources of flooding is **Negligible to Low.**
Lime Down C2	The risk to the Site from all sources of flooding is **Negligible to Low.**
Lime Down D (including BESS)	The risk to the Site from all sources of flooding is **Negligible to Low.**
Lime Down E1	The risk to the Site from all sources of flooding is **Negligible to Low.**
Lime Down E2	The risk to the Site from all sources of flooding is **Negligible to Low.**
Lime Down Cable Route Corridor (including Interconnecting Cables)	The risk to the Cable Route Corridor is **Negligible to Low**.

3.2 Embedded Mitigation

3.2.1 The following embedded mitigation measures for all phases of the Scheme have been incorporated into the Scheme design, with detailed proposals and locations to be submitted in **ES Volume 1, Chapter 3: The Scheme [EN010168/APP/6.1]**. Accompanying management plans, including the **Outline Construction Environmental Management Plan (CEMP) [EN010168/APP/7.12]** and **Outline Operational Environmental Management Plan (OEMP) [EN010168/APP/7.13],** will be secured by

DCO requirement. Accompanying management plans will be secured by DCO requirement. It should be noted that any Site-specific mitigation measures 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 [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 1m 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. string inverters 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 and mapped within **ES Volume 3, Appendix 11-9: FRA 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 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.
- 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 (SRMP) [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 best 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. The

Scheme does not require the application of 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 11.25) 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 OEMP [EN010168/APP/7.13], the Outline Decommissioning Strategy (DS) [EN010168/APP/7.14], the Outline SRMP [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

3.2.2 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 10m 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

3.2.3 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 20m 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).

3.3 Impact on off-Site Flood Risk

3.3.1 The Solar PV Panels will be mounted on frames and raised above ground level allowing flood water to flow freely underneath. Therefore, there will be no loss of floodplain volume as a result of the Scheme and no increase in flood risk elsewhere.

3.3.2 The supporting infrastructure, such as substations, BESS Area, and conversion units, is insignificant in size and should not increase flood risk elsewhere. Additionally, the embedded mitigation will ensure the supporting infrastructure will be located outside of any areas at risk, and therefore will not impact flood risk elsewhere.

3.3.3 The Cable Route Corridor will not increase flood risk elsewhere, as the finalised cable route will be below ground and installed using a combination of HDD and open span methods to ensure little disturbance to the ground (see Section 4 for further information).

3.3.4 Surface water generated by the Scheme will require management in order to ensure there is no increase in surface water runoff rates and volumes are not increased.

3.4 Consultation

3.4.1 Consultation has been undertaken throughout the EIA process with the EA and Wiltshire Council. Comments and recommendations received have been noted and applied throughout this Flood Risk Assessment and Drainage Strategy. A record of consultation and the Applicants responses are included in **ES Volume 1, Chapter 11: Hydrology, Flood Risk and Drainage [EN010168/APP/6.1]**.

4. Watercourse Crossings

4.1.1 Crossings of multiple watercourses are required to facilitate both the cable route and site access across the Scheme. These include both Main Rivers and ordinary watercourses. The crossings will be made up of a mix of Horizontal Directional Drilling (HDD) and open span methods, depending on the nature of the crossing. The HDD method will be adopted for all Main River Crossings (with the exception of SM3 which also has the potential for an area of open cut along the existing ford), with launch / receiver pits placed a minimum of 10 m from any watercourses. Where underground techniques are not feasible, open-cut techniques will be adopted subject to appropriate control measures and mitigation.

4.1.2 Access tracks will be required across the Scheme. It should be noted that the access track crossing locations will be fixed at detailed design and so the number required may change. The number of access track crossings required will be reduced where possible.

4.1.3 In total, thirty-five watercourse crossings have been identified across the Scheme. These are listed in Table 5 below, which sets out the crossing reference, location, designation, and relevant regulatory authority. Refer to **ES Volume 3, Appendix 9-9: Watercourse Crossing Schedule [EN010168/EXAM/9.10]** for detailed crossing type, methodology and environmental control information.

Table 5: Watercourse Crossings

Crossing Ref	Grid Ref	Designation	Preferred Crossing Methodology	Regulatory Authority	Location
SM1	388410,169425	Main River	HDD	EA	Cable Route Corridor
SM2	389206,171833	Main River	HDD	EA	Cable Route Corridor
SM3	390480,183099	Main River	HDD and Open Cut	EA	Main Site
SM4	392666,181666	Main River	HDD	EA	Main Site
OW1	389853,166121	Ordinary Watercourse	Open Cut	LLFA	Cable Route Corridor
OW2	389417,166527	Ordinary Watercourse	Open Cut	LLFA	Cable Route Corridor
OW3	389192,170410	Ordinary Watercourse	Open Cut	LLFA	Cable Route Corridor
OW4	388376,172528	Ordinary Watercourse	HDD	LLFA	Cable Route Corridor
OW5	388139,173372	Ordinary Watercourse	Open Cut	LLFA	Cable Route Corridor

Crossing Ref	Grid Ref	Designation	Preferred Crossing Methodology	Regulatory Authority	Location
OW6	387274,174846	Ordinary Watercourse	HDD	LLFA	Cable Route Corridor
OW7	387315,175276	Ordinary Watercourse	Open Cut	LLFA	Cable Route Corridor
OW8	386411,178511	Ordinary Watercourse	Open Cut	LLFA	Cable Route Corridor
OW9	387081,181894	Ordinary Watercourse	HDD	LLFA	Cable Route Corridor
OW10	386207,182876	Ordinary Watercourse	Open Cut	LLFA	Cable Route Corridor
OW11	388084,183521	Ordinary Watercourse	Open Cut	LLFA	Cable Route Corridor
OW12	387570,184171	Ordinary Watercourse	Open Cut	LLFA	Cable Route Corridor
OW13	387038,183926	Ordinary Watercourse	Open Cut	LLFA	Cable Route Corridor
OW14	386381,183875	Ordinary Watercourse	Open Cut	LLFA	Cable Route Corridor
OW15	391794,183143	Ordinary Watercourse	Open Cut	LLFA	Cable Route Corridor
OW16	392061,183381	Ordinary Watercourse	Open Cut	LLFA	Cable Route Corridor
OW17	386007,182541	Ordinary Watercourse	Open Cut	LLFA	Main Site
OW18	386392,182728	Ordinary Watercourse	Open Cut	LLFA	Main Site
OW19	385047,182912	Ordinary Watercourse	Open Cut	LLFA	Main Site
OW20	387696,184980	Ordinary Watercourse	Open Cut	LLFA	Main Site
OW21	388277,185155	Ordinary Watercourse	Open Cut	LLFA	Main Site
OW22	389093,183583	Ordinary Watercourse	Open Cut	LLFA	Main Site
OW23	390083,183521	Ordinary Watercourse	Open Cut	LLFA	Main Site
OW24	392044,181928	Ordinary Watercourse	Open Cut	LLFA	Main Site

Crossing Ref	Grid Ref	Designation	Preferred Crossing Methodology	Regulatory Authority	Location
OW25	392681,181548	Ordinary Watercourse	Open Cut	LLFA	Main Site
OW26	388801,185134	Ordinary Watercourse	Open Cut	LLFA	Main Site
OW27	392508,181657	Ordinary Watercourse	Open Cut	LLFA	Main Site
OW28	385421,182915	Ordinary Watercourse	Open Cut	LLFA	Main Site
OW29	388499, 183270	Ordinary Watercourse	Open Cut	LLFA	Main Site
OW30	388651, 183345	Ordinary Watercourse	Open Cut	LLFA	Main Site
OW31	388103,185398	Ordinary Watercourse	Open Cut	LLFA	Main Site

4.1.4 Although such works would ordinarily require Environmental Permits and Ordinary Watercourse Consents, 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 developed as part of the detailed CEMP. Engagement with the EA and Wiltshire Council is ongoing to ensure an agreed and proportionate approach to crossing methodologies and regulatory oversight through the DCO process.

4.1.5 The maximum depth of drilling will be under the Main Rivers and would be up to a maximum of 25m beneath the bed. For all watercourses the depth of drilling beneath the watercourse bed would be a minimum of 2m. In some cases, cables will be installed via HDD (or other non open-cut methods) to cross those watercourses deemed suitable to regularly support eels and sea trout, including Gauze Brook, Gabriel's Well Brook, Pudding Brook, Pudding Brook Tributary, and Byde Mill Brook. In all such cases cables will be buried to a minimum depth of 5 m below the channel bed, in order to maximise attenuation of electromagnetic fields and minimise the risk of any adverse impacts. A maximum depth would be finalised based on Site-specific risk assessments at each crossing location, in order to minimise groundwater interactions where possible.

4.1.6 In addition to the control and management measures for site runoff and spillage risk noted above, the methodology of the drilling, or other trenchless techniques, would include measures to minimise the risk to the environment. There are risks associated with the use of drilling muds and plant close to the channel. For example, although rare, without due care there is a risk that drilling muds can 'break out' into watercourses leading to pollution (known as 'hydraulic fracture' or 'breakout'). A site-specific hydraulic fracture (breakout) risk assessment would be developed prior to construction following further investigation of specific ground conditions at the crossing locations, and appropriate mitigation developed in line with best construction practice. There is also a need to manage drilling muds and wastewater so that this would not be spilt into the channel when working close to the banks of a watercourse. A breakout risk assessment is secured as a DCO requirement (via the **Outline CEMP [EN010168/APP/7.12]**).

4.1.7 At this stage it is assumed that where open-cut crossings are required that water flow would be maintained by damming and over pumping. Works should be carried out in the drier months where possible as this would reduce the risk of pollution propagating downstream, particularly given that these watercourses are considered ephemeral. Once the watercourses are reinstated, silt fences, geotextile matting or straw bales should be used initially to capture mobilised sediments until the watercourse has returned to a settled state. It will be a requirement that the watercourses be reinstated as found and water quality monitoring will be undertaken prior to, during, and following on from the construction activity. Regular observations of the watercourses will also be required post-works during vegetation re-establishment of the banks, especially following wet weather, to ensure that no adverse impacts have occurred. These requirements will be described in the Outline CEMP.

4.1.8 Access tracks will be constructed across the Scheme which will typically be 3.5m to 6m wide compacted stone tracks with 1:2 gradient slopes on either side. ~~They will adhere to the appropriate 8m buffer from watercourses as outlined above, except where crossings are required.~~For hydrology, flood risk and drainage purposes, buffers are applied to maintain separation from watercourses and drainage features, preserve channel access, reduce sediment and pollution risk, avoid unnecessary works within watercourse corridors, and protect existing drainage and flood conveyance function. An 8m stand-off is relevant to the Environment Agency's Flood Risk Activity Permit regime for works in, over, under or within 8m of a non-tidal Main River, flood defence or culvert, unless otherwise excluded, exempted, disapplied or controlled through the DCO. The equivalent distance for tidal Main Rivers is 16m.

~~4.1.8~~4.1.9 Separately, ecological buffers are applied on a feature-specific and activity-specific basis, as set out in **ES Volume 1, Chapter 9: Ecology and Biodiversity [REP1-015] and ES Volume 3, Appendix 9-8: CONFIDENTIAL Schedule of Protective Ecological Buffers [APP-205].** Greater buffers, including 10m or 15m stand-offs, apply where required by feature sensitivity, protected or notable species interest, designated site proximity, biosecurity requirements or construction-phase pollution prevention controls. Where more than one buffer applies, the greater distance will take precedence. The internal road layout has been designed to avoid drainage ditch and watercourse crossings wherever possible~~.~~, except where crossings are required. Strengthening or improving existing culverted crossings (which may require minor widening) will be undertaken. Where a new drainage ditch crossing is required, both a new culvert and an open span bridge crossing will be considered, with the type of crossing selected being determined based on site specific factors and in consultation with the relevant authority (generally the IDB/LLFA for the Scheme). For the purposes of assessment culverted crossings are assumed so that the worst-case scenario is assessed. Access tracks will be permeable, and localised SuDS will be implemented where necessary and feasible.

~~4.1.9~~4.1.10 Watercourse Crossings are discussed further in ES Volume 3, Appendix 11.9: Flood Risk Assessment and Drainage Strategy – Cable Route Corridor [EN010168/APP/6.3], ES Volume 1, Chapter 11: Hydrology, Flood Risk and Drainage [EN010168/APP/6.1] and ES Volume 3, Appendix 9-9: Watercourse Crossing Schedule [EN010168/EXAM/9.10].

5. Soil Management

5.1.1 Soil management measures are set out in the **Outline SRMP [EN010168/APP/7.15]**. Effective management is essential to maintain the natural drainage of the Scheme and avoid any increase in surface water flooding. The following section sets out the necessary measures required for the Scheme.

5.1.2 The nature of the Scheme means that the Solar PV Panels intercept precipitation. If the Sites are inappropriately managed, there is potential for the local hydrology to be impacted, which could lead to an increase in surface water flow.

5.1.3 In the absence of Site management, integrated drainage systems could develop within the Sites. An unmanaged drainage network could lead to the rate of infiltration being compromised and ultimately being bypassed, resulting in increased surface water flows passing to the wider fluvial network, potentially resulting in an increase of flooding off-Site.

5.1.4 There is no UK environmental guidance on managing runoff from Solar PV Panels installations. However, EN-3 Paragraph 2.10.85 states that SuDS such as swales and infiltration trenches should be incorporated. Additionally, Paragraph 2.10.87 states that solar Sites should avoid impacting existing drainage and/or culverts. Research undertaken in the United States (US) by Cook and McCuen recommend that the vegetation cover beneath the panels is well maintained or that a buffer strip be placed after the most down gradient row of panels.

5.1.5 The Maryland Department for the Environment Storm Water Design Guidance for Solar PV Panels installations[xviii] recommends 'non-structural techniques like disconnecting impervious cover' to reduce runoff by promoting overland filtering and infiltration. The following must also be considered:

- Runoff must sheet flow onto and across vegetated areas to maintain the disconnection;
- Disconnecting impervious surfaces works best in undisturbed soils. To minimise disturbance and compaction, construction vehicles and equipment should avoid areas used for disconnection during installation of the Solar PV Panels. Where disturbance is unavoidable, post construction soil treatment (deep ploughing) to restore soil condition may be required; and
- Groundcover vegetation must be maintained in good condition in those areas receiving disconnected runoff. Typically this maintenance is no different than other lawn or landscaped areas. However, areas receiving runoff should be protected (e.g. planting shrubs or trees along the perimeter) from future compaction.

5.1.6 To minimise the potential impacts from soil compaction and changes in flow pathways a number of mitigation techniques have been suggested as follows. To meet soil protection guidance, DEFRA objectives of Construction Code of Practice for the Sustainable Use of Soils on Construction sites[xix] are recommended.

5.1.7 Soil compaction will be limited during the construction phase by a number of measures;

- Using only light machinery to install the Solar PV Panels and low ground pressure vehicles to be used during extreme rainfall events;

- Where light machinery is unable to be utilised in areas such as the BESS Area, appropriate mitigations will be detailed in the **Outline SRMP [EN010168/APP/7.15]**, to protect the soil from compaction;
- Where construction has resulted in soil compaction, the areas between panel rows would be tilled / scarified to an appropriate depth and then re-seeded with an appropriate vegetation cover; and
- Impacts to existing drainage and/or culverts will be avoided. If impacts to existing drainage and/or culverts is unavoidable, where possible, the system will be restored and improved.

5.1.8 Soil compaction will be limited during the operation and maintenance phase by the following measures:

- During the initial establishment phase, the condition of planting and soil will be regularly monitored to ensure vegetation is establishing well, ground cover is maintained, and there are no early signs of compaction. Any issues will be addressed promptly through remedial measures;
- The presence of well-established vegetation across the site, including grassland and meadow planting, will help reduce runoff and prevent erosion. This supports the long-term maintenance of healthy soil structure. These measures are set out in the **Outline LEMP [EN010168/APP/7.18]**; and
- Maintenance of infrastructure during the operation and maintenance phase will generally involve only light machinery, with access limited to established or permeable routes. This approach is consistent with the **Outline SRMP [EN010168/APP/7.15]**, which sets out how any temporary disturbance will be minimised and how ground conditions will be reinstated where necessary.

5.1.9 All access tracks will be made out of granular material and will therefore be permeable, reducing the potential increase in surface runoff, which aligns with NPS EN-3 Paragraph 2.10.85. This will be secured via the **Outline CEMP [EN010168/APP/7.12]**).

6. Drainage Strategy

6.1 Introduction

6.1.1 In general, the Scheme currently comprises undeveloped, agricultural land with no formal, positive drainage network. Surface water runoff generated within the existing solar Sites is anticipated to discharge into the surrounding land drainage network at an uncontrolled rate.

6.1.2 The Scheme measures in excess of 1ha in size and therefore a Sustainable Drainage Strategy is required to support the DCO application in line with the NPS EN-1. To provide context to the level of detail required for an effective SuDS strategy, EN-1 Paragraph 5.8.15 indicates that types of SuDS should be explained and justified, along with the method of discharge and why they are appropriate. Additionally, this should be in line with the PPG and the government's non-statutory technical standards for SuDS.

6.1.3 The BRE Planning Guidance for the development of large-scale ground mounted solar PV systems[xx] states:

6.1.4 "The Environment Agency has advised that, due to the size of solar PV farms, planning applications will be expected to be accompanied by a Flood Risk Assessment. This will need to consider the impact of drainage. As solar panels will drain to the existing ground, the impact will not in general be significant and therefore this should not be an onerous requirement."

6.1.5 All Sites alongside the Cable Route Corridor, which make up the Scheme, will comprise natural ground cover post development albeit with the introduction of Solar PV Panels on raised frames and limited areas of hardstanding associated with substations and inverters and BESS. The Scheme will remain largely permeable following construction. The below assessment, therefore, forms the Drainage Strategy for the vast majority of the Scheme with the BESS Area and 400 kV Substation being assessed separately within **ES Volume 3, Appendix 11.6: Flood Risk Assessment and Drainage Strategy – Lime Down D [EN010168/APP/6.3]**.

6.2 Surface Water Runoff Characteristics of the Scheme

6.2.1 The Scheme does not comprise a single impermeable development area. A proportionate drainage strategy has therefore been adopted which distinguishes between infrastructure types according to whether they create a connected impermeable drainage catchment, remain permeable by design, are too small or dispersed to materially alter runoff, or comprise Solar PV panelled areas that drain to existing ground.

Infrastructure	Drainage Strategy Approach
Infrastructure requiring formal drainage design	This includes substations, BESS compounds, formal hardstanding, switchgear compounds where constructed as formal hardstanding, impermeable access areas and any positively drained infrastructure. These areas are treated as formal drainage catchments. The relevant site-specific appendices provide the drainage design basis, including

	contributing areas, runoff calculations, discharge rates, attenuation requirements, SuDS options, water quality controls and exceedance principles. Final detailed drainage design will be secured through Requirement 11 of the **Draft DCO [REP1-007].**
Infrastructure permeable by design	This includes permeable access tracks and other permeable infrastructure where formed using granular or equivalent permeable construction, laid broadly at existing levels, unkerbed and not connected to a positive drainage network. These areas are not treated as formal impermeable catchments because rainfall will continue to drain diffusely to the track construction and surrounding ground. This approach is consistent with NPS EN-3 paragraph 2.10.85.
Small or dispersed infrastructure	This includes small, isolated or dispersed infrastructure such as fencing, panel supports, cable routes and small electrical components where these do not form a connected impermeable catchment. Where localised source control is required, this will be addressed through passive measures such as gravel margins, filter drains, French drains or equivalent localised features. These elements are not predicted to materially alter runoff rates or volumes at site scale.
Solar PV panelled areas	Solar PV panelled areas are not treated as impermeable drainage catchments. The panels are elevated above ground level, drain to the existing ground, are not sealed into a drainage network and do not create a connected impermeable surface. This approach is consistent with NPS EN-3 paragraph 2.10.84 and the submitted evidence base, including the **Applicant's Response to the Lead Local Flood Authority on Hydraulic Modelling Requirements [REP2-045].**

6.2.2 This categorisation informs the drainage hierarchy, discharge principles and exceedance routing set out below. It also provides the basis for the site-specific drainage strategy updates included in the relevant **Flood Risk Assessment and Drainage Strategy** appendices **[REP1-039, REP1-041, REP1-043, REP1-045, REP1-047, REP1-049, REP1-051 and REP1-053]**.

6.2.3 The approach provides the framework for addressing the surface water drainage matters identified in **NPS EN-1 paragraph 5.8.15 bullet 11(i) to (x)** at an outline drainage strategy stage. Existing drainage arrangements, runoff characteristics, drainage hierarchy, discharge principles, SuDS selection, exceedance routing and maintenance arrangements are set out in this covering report and developed further in the relevant site-specific appendices. Final detailed drainage design will be submitted and approved under Requirement 11 of the **Draft DCO [REP1-007]**.

~~6.2~~6.3 Ground Conditions

~~6.2.1~~6.3.1 The majority of the Scheme is underlain by no superficial deposits. However, there are sparse areas of Head (clay, silt, sand, and gravel) underlying Lime Down B and C. Additionally, Lime Down B and D have sparse areas of Alluvium (clay, silt, sand, and gravel). The following bedrock underlies the Scheme:

- Forest Marble Formation (Mudstone; Limestone & Ooidal);

- Cornbrash Formation (Limestone);
- Kellyaways Clay Member (Mudstone; Sandstone and siltstone); and
- Chalfield Oolite Formation (Limestone & Oodial).

~~6.2.2~~6.3.2 There is more variation in the underlying bedrock at the Scheme which is detailed further in each Site-specific Appendix.

~~6.2.3~~6.3.3 The underlying Source Protection Zones (SPZs) taken from MAGIC Mapping within the Scheme include Zone I: Subsurface Activity, Zone II Subsurface Activity and Zone II Outer Protection. Site-specific SPZs are discussed further within each Site-specific Appendix.

6.3.4 Ground conditions and groundwater levels presented within this assessment are based on currently available desk based information. Pre commencement ground investigation and infiltration testing will be undertaken prior to construction to confirm local ground conditions, infiltration suitability and the potential presence of groundwater, with the findings informing the subsequent detailed drainage and infrastructure design, where required.

~~6.3~~6.4 Drainage Hierarchy

6.4.1 The drainage hierarchy has been applied proportionately across the Scheme. As the majority of the Site will remain permeable and retain vegetated ground cover beneath the Solar PV arrays, infiltration and diffuse drainage to ground will continue to represent the primary drainage mechanism across much of the Scheme area, with formal drainage infrastructure only anticipated to be required for engineered infrastructure areas, including substations, BESS compounds, switchgear compounds where constructed as formal hardstanding, formal hardstanding areas and any positively drained infrastructure.

~~6.3.1~~6.4.2 The recommended surface water drainage hierarchy (Paragraph 5.8.15 of the NPS EN-1 and Paragraph 056 (Ref ID: 7-056-20220825) of the PPG: Flood Risk and Coastal Change) is to utilise soakaway systems or infiltration as the preferred option, followed by discharging to an appropriate watercourse, followed by discharging to a public surface water sewer, and then a highway drain or other drainage system. If this is not feasible, the final option is to discharge to an existing combined sewer.

Surface Water Discharge to Soakaway

~~6.3.2~~6.4.3 The first consideration for the disposal of surface water is infiltration (soakaways and permeable surfaces). The Scheme is undeveloped agricultural land, informally draining to ground and in exceedance events in excess of the infiltration capacity, into the surrounding land drainage ditches. The vast majority of the Scheme will comprise natural ground cover post construction albeit with the introduction of Solar PV Panels on raised frames and limited areas of hardstanding ~~associate~~associated with substations, switchgear and ~~inverters~~other electrical infrastructure. Any proposed access or surfacing will be permeable. The Scheme would therefore remain largely permeable following development, as per the existing situation.

Surface Water Discharge to Watercourse

~~6.3.3~~6.4.4 Where soakaways are not suitable, a connection to watercourse is the next preferred option according to the recommended surface water drainage hierarchy. The nearest viable watercourses for connection from each of the Sites, either flowing through the Sites or along the boundaries, are as follows:

- Lime Down A – unnamed land drainage ditches adjacent to the southern Site boundary;
- Lime Down B – unnamed land drainage ditches within the Site, leading to a Tributary of the River Avon;
- Lime Down C1 – a network of unnamed land drainage ditches both within and in the vicinity of the Site, and a tributary of the River Avon;
- Lime Down C2 – a network of unnamed land drainage ditches both within and in the vicinity of the Site;
- Lime Down D – the Gauze Brook located through the eastern extent of Lime Down D, an unnamed Main River which flows along the northern boundary, and minor tributaries located within the Site;
- Lime Down E1 – tributary of Gauze Brook at the north-eastern boundary; and
- Lime Down E2 – Gabriel's Well (Main River) which runs through the central extents of Lime Down E2, leading to the River Avon.

~~6.3.4~~6.4.5 As noted above, the majority of the Scheme comprises permeable development, including the ~~solar~~Solar PV panelled areas, fencing, ~~remote switchgear, and~~ permeable access tracks and small or dispersed infrastructure. In these areas, surface water runoff will typically either infiltrate or drain informally toward adjacent ditches and watercourses, broadly following the existing hydrological regime. No new engineered outfalls are proposed in these areas, and formal discharge consents are not anticipated to be required.

~~6.3.5~~6.4.6 However, impermeable or positively drained infrastructure, such as substations~~ and~~, Battery Energy Storage System (BESS) compounds, switchgear compounds where constructed as formal hardstanding, formal hardstanding areas and any positively drained access infrastructure, will incorporate dedicated surface water drainage systems. These systems ~~are expected to~~will include ~~lined~~appropriate SuDS~~ features~~, attenuation~~,~~ and flow control ~~devices designed to limit runoff to greenfield rates~~measures, with lined drainage or containment measures provided where required by water quality, firewater or pollution control requirements. Discharge from these systems is likely to be made to nearby ditches or watercourses and may involve new engineered outfalls.

~~6.3.6~~6.4.7 Where discharge is proposed to an ordinary watercourse, ordinary watercourse consent ~~may~~would ordinarily be required from the Lead Local Flood Authority under the Land Drainage Act 1991~~. These consents are not capable of being~~ unless disapplied or otherwise controlled through the Development Consent Order ~~(DCO)~~. The final requirement for any ordinary watercourse outfalls and associated controls will be ~~addressed at the appropriate stage of~~confirmed during detailed design.

~~6.3.7~~6.4.8 Where outfalls are required to a Main River, an Environmental Permit for Flood Risk Activities may ordinarily be required from the Environment Agency under the Environmental Permitting (England and Wales) Regulations 2016. The DCO application includes a request to disapply the requirement for such permits under regulation 5(1) of the Regulations, subject to the agreement of appropriate protective provisions. The final requirement for such outfalls and any associated controls will be confirmed during detailed design.

Surface Water Discharge to Surface Water Sewer

~~6.3.8~~6.4.9 As described above, ~~draining~~diffuse drainage to ground ~~is~~ will remain the primary drainage mechanism across the majority of the Scheme. Where formal drainage systems are required and infiltration is not feasible ~~as per the~~ or appropriate, controlled discharge to existing ~~scenario and therefore a~~ditches or watercourses will be considered in accordance with the drainage hierarchy. A connection to ~~the~~a public surface water sewer or combined sewer is ~~not required~~therefore not proposed and would only be considered where higher-order drainage options are not feasible.

~~6.4~~6.5 Surface Water Discharge

~~6.4.1 The Scheme will be freely draining through perimeter gaps around all Solar PV Panels, there will be minimal increase in impermeable area meaning the proposals will not increase surface water risk elsewhere.~~

~~6.4.2 As a result of the construction of the Solar PV Panels , some rainfall will be intercepted by the surface of the Solar PV Panels before reaching ground level. Intercepted rainfall will either run down the face of the panels, due to the angle at which they are positioned, and drip onto the ground below or will be lost due to evaporation from the face of the panels.~~

~~6.4.3 Where rainwater drips onto the ground below, the energy of the flow from the surface of the panels is likely to be greater than that of the rainfall (especially where rainwater collects at the bottom edge of the Solar PV Panels before dripping onto the ground below) which could result in the erosion of ground without appropriate mitigation. The erosion of the ground could then result in the formation of rivulets which could increase the speed of runoff throughout the Sites.~~

~~6.4.4 In order to mitigate against potential erosion, the existing intensively managed agricultural land will be replaced by planted grassland below the Solar PV Panels. The planted surface will act as a level spread / energy dissipater to promote low erosivity sheet flow during the operation and maintenance phase of the Scheme. The vegetation will be managed organically and will either be mowed or used for light grazing.~~

~~6.4.5 The Solar PV Panels will not be tightly compacted and will not form one continuous surface. Small gaps will exist between each panel, which will allow water to drip onto the ground below from several locations rather than as concentrated runoff from the bottom edge. This spread of water dripping will reduce the potential for erosion to occur.~~

~~6.4.6 The access track will be designed to be permeable, thereby allowing surface water runoff to percolate into the ground below.~~

~~6.4.7 Smaller electrical infrastructure associated with the Solar PV Panels (excludes substations and BESS) will be sited on concrete pads. The concrete bases will be surrounded by gravel filled filter trenches, constructed to limit the lateral flow of water away from the equipment and replace the loss of natural infiltration caused by the concrete bases themselves. Surface water would be stored within the gravel~~

sub-base prior to infiltrating into the ground as per the existing situation.

6.4.8 For the BESS Area at Lime Down D (which includes 132kV and 400kV substations), a Drainage Strategy has been conducted within **ES Volume 3, Appendix 11.6: Flood Risk Assessment and Drainage Strategy – Lime Down D [EN010168/APP/6.3]** to address the increase in hardstanding resulting from the facilities. For areas with increased hardstanding, the peak surface water discharge rate will be limited to the existing 1 in 2 year greenfield runoff rate with a 30% betterment provided. This is a significant betterment of surface water runoff rates generated during a 1 in 2 year storm event at these Sites, in line with NPS EN-1 and guidance received from Wiltshire Council LLFA.

6.4.9 During construction of the Scheme, temporary construction lay-down areas will be provided. Temporary drainage measures will be implemented within the lay-down areas to ensure there is no increase in surface water runoff as a result of the construction compound. The Outline CEMP accompanying the DCO application describes these measures during the construction phase, with further information included in **ES Volume 1, Chapter 11: Hydrology, Flood Risk and Drainage [EN010168/APP/6.1].**

6.4.10 In addition, construction of the Scheme has the potential to result in the compaction of soils thereby reducing the soil's ability to accept surface water runoff. It is recommended that the movement of large vehicles is limited where possible to proposed access tracks in order to reduce the potential for soil compaction to occur. Vehicles should be fitted with low pressure tyres to further reduce the impact on the underlying soil. Refer to the **Outline SRMP [EN010168/APP/7.15]** for further information.

6.4.11 The aforementioned techniques will discourage soil erosion within the Scheme, whilst maintaining the existing overland flow paths.

6.5.1 Existing surface water drainage across the Scheme is predominantly informal. Surface water drains to ground and, where rainfall exceeds the infiltration capacity of the ground, follows existing topographic flow routes toward field drains, ditches, ordinary watercourses and Main Rivers.

6.5.2 For Solar PV panelled areas, permeable access tracks and small or dispersed infrastructure, surface water will continue to drain diffusely to the existing ground and surrounding field drainage network. These elements do not create connected impermeable drainage catchments and no new formal outfalls are proposed for those areas. No formal attenuation storage is therefore required for these elements.

6.5.3 The drainage strategy for these areas is to maintain existing field-scale drainage behaviour as far as practicable. This will be achieved by maintaining vegetated ground cover, avoiding sustained bare ground, managing soil compaction, maintaining diffuse flow and avoiding the creation of connected preferential flow routes. These measures are secured through the **Outline CEMP [REP2-019]**, **Outline Soil Resources Management Plan [APP-280]**, **Outline Landscape and Ecological Management Plan [APP-283]** and **Outline OEMP [REP2-021]**.

6.5.4 Where small or dispersed infrastructure requires localised source control, passive drainage measures such as gravel margins, gravel-filled filter trenches, French drains or equivalent features may be used. These features will manage runoff locally at source and avoid the need to create a connected positive drainage network.

6.5.5 Formal surface water drainage will be provided for those elements of the Scheme that introduce connected impermeable or positively drained catchments. This includes substations, BESS compounds, switchgear compounds where constructed as formal hardstanding, formal hardstanding areas and any positively drained access infrastructure. The site-specific **Flood Risk Assessment and Drainage Strategy** appendices **[REP1-039, REP1-041, REP1-043, REP1-045, REP1-047, REP1-049, REP1-051 and REP1-053]** set out the relevant drainage strategy information for each Site and the Cable Route Corridor, including contributing areas, discharge rates, attenuation requirements, SuDS options and exceedance principles.

6.5.6 Where controlled discharge is required, peak discharge rates will be restricted to 70% of the equivalent greenfield runoff rate, in accordance with the drainage strategy approach applied in the site-specific appendices and the Wiltshire Council LLFA betterment standard. Attenuation will be provided for the 1 in 100 year event plus climate change. The final contributing areas, discharge rates, attenuation volumes, SuDS features, outfall arrangements and exceedance routes will be confirmed at detailed design stage.

6.5.7 Where discharge from a formal drainage system is required, the drainage hierarchy will be followed. Infiltration will be considered first where feasible and appropriate, subject to ground conditions, groundwater, Source Protection Zones and water quality risk. Where infiltration is not feasible or appropriate, controlled discharge to an existing ditch or watercourse will be considered. Discharge to a public sewer, highway drain or other drainage system would only be considered where higher-order options are not feasible.

6.5.8 Temporary construction laydown areas and compounds will be managed through temporary drainage, silt control and runoff management measures secured through the **Outline CEMP [REP2-019]**. Construction-phase soil compaction risks will be managed through the **Outline Soil Resources Management Plan [APP-280]**, including controls on construction trafficking, use of appropriate plant, soil handling, decompaction and reinstatement where required.

6.5.9 The above approach will maintain diffuse drainage across the majority of the Scheme, provide formal drainage design where connected impermeable drainage catchments are created, and prevent surface water runoff from causing an increase in flood risk elsewhere. Final detailed drainage design will be submitted and approved under Requirement 11 of the **Draft DCO [REP1-007]**.

~~6.5~~6.6 Event Exceedance

~~6.5.1~~6.6.1 ~~Any surface~~As the majority of the Scheme will remain permeable in nature, exceedance flows from the Solar PV panelled areas, permeable access tracks and small or dispersed infrastructure are anticipated to generally follow existing topographic overland flow pathways. Surface water runoff in excess of the infiltration capacity of the ground ~~may naturally~~would continue to drain ~~into~~toward the surrounding land drainage ditches ~~/~~and watercourses as per the existing scenario.

6.6.2 For formal drainage catchments, including substations, BESS compounds, switchgear compounds where constructed as formal hardstanding, formal hardstanding areas and any positively drained infrastructure, exceedance routing will be confirmed through the detailed drainage design secured by Requirement 11 of the **Draft DCO [REP1-007]**. Exceedance flows will be routed away from sensitive infrastructure where practicable and managed so as not to increase flood risk elsewhere.

~~6.6~~6.7 Foul Water Discharge

~~6.6.1~~6.7.1 Due to the remote and rural nature of the Scheme, no public foul sewer connections are available. During construction, welfare facilities will be provided via self-contained portable units, managed and maintained by a licensed contractor. These units are sealed, require no connection to the on-site drainage infrastructure, and will be regularly emptied and removed from site in accordance with standard construction practice and relevant regulatory requirements.

~~6.6.2~~6.7.2 During the operational phase, welfare provision will be limited to the substation compounds only. Foul water generated at these locations will be collected and stored in sealed septic tanks or cesspools, with periodic removal by tanker to an appropriately licensed disposal facility. No discharge to ground or watercourse will occur, and no connection to a public sewer is proposed or required.

~~6.6.3~~6.7.3 Given the very limited scale of operational foul water generation and the absence of mains sewerage infrastructure, this approach is considered proportionate and consistent with relevant Building Regulations and Environment Agency guidance for non-mains foul drainage in remote locations. The final specification of welfare systems will be confirmed at detailed design stage.

7. Sequential and Exception Test

7.1.1 **Annex C: 'Sequential and Exception Test'** of the **Planning Statement [EN010168/APP/7.2]** applies the Sequential and Exception Test in relation to the Scheme.

7.1.2 It sets out how the Sequential Test has been incorporated into the overall methodology for site selection for the Solar PV Sites for the Scheme, including a preference to use sites within Flood Zone 1, before widening the search to include areas of Flood Zones 2 and 3. On a site level, the report sets out the application of the Sequential Test in the design of the Solar PV Sites and how more vulnerable infrastructure has been located in areas at lower risk of flooding. It also sets out other proposed design features that have been incorporated to reduce the risk of flooding.

7.1.3 Thereafter, it applies the Exception Test and demonstrates that: the Scheme would provide wider sustainability benefits to the community that would outweigh flood risk; and the Scheme will be safe for its lifetime taking account of the vulnerability of its users, without increasing flood risk elsewhere, and where possible, will reduce flood risk overall.

7.1.4 A summary of key factors that have been considered when applying the tests is set out below:

7.1.5 The Solar PV Panels will be mounted on raised frames above surrounding ground level allowing flood water to flow freely underneath. Where relevant, floodplain volume loss calculations have been undertaken to demonstrate that any panel supports located within the floodplain will have a negligible impact on floodplain storage capacity.

7.1.6 The Scheme is freely draining through perimeter gaps around all panels, allowing for infiltration as existing within the grassland/vegetation surrounding and beneath the panels. There will be minimal increase in impermeable area meaning the proposals will not increase surface water flood risk elsewhere.

7.1.7 Each individual supporting Appendix (**ES Volume 3, Appendix 11-1 to 11-9 [EN010168/APP/6.1]**) where relevant, has been further assessed either through using the Manning's open channel flow formula to quantify potential fluvial flood risk to the Site during a 1% AEP + Climate Change extent, or through hydraulic modelling which can be found within the specific Appendices. Sensitive electrical equipment, such as substations and conversion units, have been sequentially located outside of the areas identified within the flood risk extent where practicable. Associated infrastructure has been designed to be flood resilient.

7.1.8 The Cable Route Corridor could be interpreted as crossing some areas at fluvial or surface water risk, however given that the cable route is ultimately to be placed sub-surface, impact on flood risk in these areas will be negligible.

[i] https://flood-map-for-planning.service.gov.uk
[ii] https://www.gov.uk/government/publications/overarching-national-policy-statement-for-energy-en-1
[iii] https://assets.publishing.service.gov.uk/media/64252f5f2fa848000cec0f52/NPS_EN-3.pdf
[iv] https://assets.publishing.service.gov.uk/media/64252f852fa848000cec0f53/NPS_EN-5.pdf
[v] https://www.gov.uk/government/publications/national-planning-policy-framework--2
[vi] https://www.gov.uk/government/collections/planning-practice-guidance
[vii] https://www.ciria.org/CIRIA/CIRIA/Item_Detail.aspx?iProductcode=C753&Category=BOOK
[viii] https://www.wiltshire.gov.uk/media/204/Wiltshire-local-flood-risk-management-strategy/pdf/Flood-risk-management-strategy-civil-emergencies.pdf
[ix] https://www.wiltshire.gov.uk/media/372/Wiltshire-Core-Strategy-adopted-2015/pdf/Wcs.pdf?m=1574343137353
[x] https://www.wiltshire.gov.uk/article/8029/Overview
[xi] https://check-long-term-flood-risk.service.gov.uk/postcode
[xii] https://www.bgs.ac.uk/map-viewers/geoindex-onshore/
[xiii] https://magic.defra.gov.uk/MagicMap.aspx
[xiv] https://www.gov.uk/government/collections/planning-practice-guidance
[xv] https://www.wiltshire.gov.uk/media/372/Wiltshire-Core-Strategy-adopted-2015/pdf/Wiltshire_Core_Strategy_2015.pdf?m=1735555642237
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[xvii] https://environment.data.gov.uk/catchment-planning/England/classifications
[xviii] https://mde.maryland.gov/programs/water/StormwaterManagementProgram/Documents/ESDMEP%20Design%20Guidance%20Solar%20Panels.pdf
[xix] https://www.gov.uk/government/publications/code-of-practice-for-the-sustainable-use-of-soils-on-construction-sites
[xx] https://files.bregroup.com/solar/KN5524_Planning_Guidance_reduced.pdf