Light Valley Solar

Environmental Statement Volume 3

Appendix 15.4: Outline Drainage Strategy

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Appendix 15.4: Outline Drainage Strategy

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1 Introduction

1.1 Overview

1.1.1 Ove Arup & Partners Limited (Arup) have been commissioned by Light Valley Solar Limited (the 'Applicant'), a subsidiary of Island Green Power UK limited, to prepare this outline Drainage Strategy for the development of a solar farm and associated infrastructure within the administrative area of North Yorkshire Council (NYC), within the Selby District.

1.1.2 The Proposed Development comprises a solar photovoltaic (PV) electricity generating station of over 100 megawatts (MW) and 'associated development' comprising a Battery Energy Storage System (BESS), grid connection infrastructure and other infrastructure integral to the construction, operation and maintenance, and decommissioning phases.

1.1.3 The main element of the Proposed Development comprises seven Solar Development Sites (Solar Development Sites 1-4 and 6-8) that will accommodate the Solar PV Panels. A BESS Compound will be located within Solar Development Site 2.

1.1.4 The Cable Route Corridor is the area within which the export connection cables (hereafter referred to as the 'Grid Connection Cables') would be located to connect the Solar PV Sites to the National Grid at the existing Monk Fryston Substation (hereafter referred to as the 'Existing National Grid Monk Fryston Substation') and the area within which cables connecting the Solar Development Sites would be located (hereafter referred to as 'Interconnecting Cables') (refer to Figure 2.1: Illustrative Site Layout Plan (ES Volume 2) [**EN0110012/APP/LVS/06.02.02.01**].

1.1.5 Further details of the Proposed Development are presented in Chapter 2: The Proposed Development (ES Volume 1) [**EN0110012/APP/LVS/06.01.02**] and the design envelope for the Proposed Development is set out in the Design Parameters and Commitments Document [**EN0110012/APP/LVS/05.06**] and the limits of deviation shown on the Works Plans [**EN0110012/APP/LVS/02.03**].

1.1.6 The Proposed Development has been assessed with regards to the requirements of the National Policy Statement for Energy (NPS), the National Planning Policy Framework (NPPF) and in accordance with the Planning Policy Guidance (PPG) for 'Flood Risk and Coastal Change' and 'Climate Change' to determine the suitability of the Proposed Development in this area.

1.1.7 This appendix sets out the outline Drainage Strategy for the Proposed Development and summarises how surface water runoff will be managed in accordance with relevant regulatory requirements and guidance. It forms an appendix to Chapter 15: Water Resources and Flood Risk (ES Volume 1) [**EN0110012/APP/LVS/06.01.15**].

1.1.8 This outline Drainage Strategy introduces the Proposed Development and provides information on the proposed approach to surface water management, including the use of sustainable drainage systems (SuDS) where appropriate. It describes the drainage design principles for the Proposed Development and outlines the discharge arrangements including the basis for restricting discharge rates and managing runoff volumes.

1.1.9 A Level 3 Flood Risk Assessment (FRA), as defined in CIRIA C624 (Ref 1), is presented in Appendix 15.1: Flood Risk Assessment (ES Volume 3) [**EN0110012/APP/LVS/06.03.15.01**] and should be read alongside this outline Drainage Strategy.

1.1.10 The assessment builds on the desk-based study, produced as part of the Preliminary Environmental Impact Report (PEIR), using readily available information including Product Data from the Environment Agency (EA).The outline Drainage Strategy is based on the limits of deviation shown on the Works Plans and the Design Parameters [**EN110012/APP/LVS/02.03**] set out in Chapter 2: The Proposed Development (ES Volume 1) [**EN0110012/APP/LVS/06.01.02**] and the parameters set out in the Design Parameters and Commitments Document **[EN0110012/APP/LVS/05.06]**.

1.2 Project background and scope

1.2.1 The Proposed Development comprises a total of seven Solar Development Sites (herein referred to as 'Solar Development Sites'/'Solar Development Sites 1-4 and 6-8' or individually) and the Cable Route Corridor.

1.2.2 Solar Development Site 5 was previously included at the EIA Scoping stage but was removed prior to PEIR due to flood risk concerns. Additionally, between the PEIR and ES stages, the southernmost land parcel of Solar Development Site 4 was also removed from the Order Limits. Although no development was proposed in this area, the area lies within Flood Zone 3b washland and was removed for similar flood-related reasons.

1.2.3 The FRA for each Solar Development Site and the Cable Route Corridor is presented within Appendix 15.1: Flood Risk Assessment (ES Volume 3) [**EN0110012/APP/LVS/06.03.15.01**], with each being discussed individually within a site-specific FRA in Annex A – G.

1.2.4 The Proposed Development will contribute to the UK Government's legally binding target to reach net-zero emissions by 2050 and respond to the projected increase in demand for electricity, as well as improving UK energy security and resilience in line with national strategy. The Overarching National Policy Statement for Energy (NPS EN-1) (Ref 15) establishes that the delivery for low carbon energy infrastructure, such as the Proposed Development, is of Critical National Priority (CNP).

1.3 Purpose of this report

1.3.1 An outline Drainage Strategy is required to demonstrate that surface water runoff arising from the Proposed Development can be managed appropriately during construction and operation, without increasing surface water flood risk on-site or elsewhere. The purpose of this outline Drainage Strategy is to support the Secretary of State (SoS) in making an informed decision in relation to the Proposed Development by setting out principles relating to surface water management. The strategy considers the management of runoff generated by the development and the potential effects on receiving drainage systems and adjacent land.

1.3.2 The proposed drainage approach is intended to manage runoff sustainably and reduce the likelihood of surface water flooding, whilst ensuring that flows are controlled and appropriately conveyed during exceedance events. Further detail is provided in Sections 5 and 6 of this outline Drainage Strategy.

1.4 Sources of information

1.4.1 The following guidelines and references have been used in preparation of this outline Drainage Strategy:

1) National Planning Policy Framework (NPPF) Planning Practice Guidance (PPG) documents for 'Flood Risk and Coastal Change' (Ref 2) and 'Flood Risk Assessments: Climate Change Allowances' (Ref 3);
2) DEFRA/EA Flood Risk Assessment guidance for planning applications (Ref 4);
3) DEFRA/EA Flood Risk Standing Advice for England (Ref 5);
4) CIRIA Report ~~C735~~C753 'The SuDS Manual' (Ref 6);
5) NYC Strategic Flood Risk Assessment 2016 (SFRA) (Ref 7);
6) Selby Local Plan (Ref 8);
7) NYC Flood Risk Management Strategy 2022 (Ref 9);
8) NYC SuDS guidance (Ref 10); and
9) National Standards for SuDS guidance (Ref 13).

1.5 Use and limitations

1.5.1 All reasonable skill, care and diligence have been exercised in preparing this report within the timescale available and in accordance with the technical requirements of the brief. Notwithstanding the efforts made by the professional team in preparing the report, it is possible that other flood risks, as yet undetected, may exist and consequently reliance on this report must be limited accordingly. Arup does not accept any liability for the accuracy or otherwise of any information derived from secondary sources, however, endeavours have been made to verify the suitability and appropriateness of information obtained in this way.

2 Planning policy context

2.1 National planning policy

2.1.1 This section considers national planning policy relevant to the Proposed Development, with particular regard to surface water management.

2.1.2 The approval of nationally significant energy infrastructure projects such as the Proposed Development is through a Development Consent Order (DCO) application. National Policy Statements (NPS) are published by the Department for Energy Security and Net Zero (DESNZ), which set out the requirements for assessing and approving such projects. For this solar project, the following are relevant:

1) Overarching National Policy Statement for Energy (EN-1) (December 2025 (Ref 15));
2) National Policy Statement for Renewable Energy Infrastructure (EN-3) (December 2025 (Ref 16)); and
3) National Policy Statement for Electricity Networks Infrastructure (EN-5) (December 2025 (Ref 17)).

NPS for Energy (EN-1)

2.1.3 The Overarching National Policy Statement for Energy (EN-1), revised by the Department for Energy Security and Net Zero (DESNZ) in 2025, reinforces the objectives for the development of Nationally Significant Infrastructure Projects (NSIPS) and updates the legal framework for planning decisions. The revision embeds the Clean Power 2030 strategy as a core policy driver. Specific policy relating to flood risk is detailed in Section 5.6 and Section 5.8 of NPS EN-1 (Ref 15).

2.1.4 According to NPS EN-1 (Ref 15), paragraph 5.8.13, site-specific FRAs are required 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:

1) Sites of 1 hectare or more;
2) Land which has been identified by the EA or NRW as having critical drainage problems;
3) Land identified (for example in a local authority strategic flood risk assessment) as being at increased flood risk in the future;
4) Land that may be subject to other sources of flooding (for example surface water); and
5) where the EA or NRW, Lead Local Flood Authority (LLFA), IDB or other body have indicated that there may be drainage problems.

2.1.5 Relevant factors for the Secretary of State to consider when determining an application for development consent are listed within paragraph 5.8.36. In relation to the surface water drainage aspects relevant to this outline Drainage Strategy, these include that:

6) *The proposal is in line with any relevant national and local flood risk management strategy;*

7) *Sustainable drainage systems (SuDS) have been used unless there is clear evidence that their use would be inappropriate;*

8) *In flood risk areas the project is designed and constructed to remain safe and operational during its lifetime, without increasing flood risk elsewhere;*

9) *Land that is likely to be needed for present and future flood risk management infrastructure has been appropriately safeguarded from development to the extent that development would not prevent or hinder its construction, operation or maintenance.'*

2.1.6 Other considerations within paragraph 5.8.36 relate specifically to the assessment of flood risk, including the Sequential Test and safe access/escape, which are addressed separately within Appendix 15.1 Flood Risk Assessment (ES Volume 3) [**EN0110012/APP/LVS/06.03.15.01**].

2.1.7 NPS EN-1 (2025) sets out clear expectations in relation to pollution prevention and control. Paragraphs 4.12.14, 5.16.2, 5.16.6 and 5.16.10 require applicants to demonstrate that developments incorporate appropriate measures to prevent, reduce and, where possible, mitigate pollution impacts on the water environment. This includes the use of industry best practice, pollution control systems, and management plans during construction and operation.

NPS for Renewable Energy Infrastructure (EN-3)

2.1.8 The NPS for Renewable Energy Infrastructure (EN-3) (Ref 16) sets out the policy framework for the development of nationally significant renewable energy projects, including solar PV, in England and Wales.

2.1.9 According to NPS EN-3, paragraph 2.4.11, solar PV sites may be proposed in low lying exposed sites. For these proposals, applicants should consider how the plant will be resilient to the increased risk of flooding and impact of higher temperatures. The 2025 revision implements strengthened climate adaptation requirements which emphasise the need to assess climate resilience in line with projected temperature extremes and flood risk scenarios.

2.1.10 According to NPS EN-3, paragraph 2.10.84, the impact of drainage should be considered and that, as solar PV panels will drain to the existing ground, the impact will not, in general, be significant. It further clarifies that drainage strategies should align with local flood risk management plans and consider cumulative impacts where multiple solar PV projects are proposed, supporting the integrated approach to infrastructure planning.

NPS for Electricity Networks Infrastructure (EN-5)

2.1.11 The NPS for Electricity Networks Infrastructure (EN-5) (Ref 17), designated by the DESNZ in January 2024, is part of the suite of NPSs, reflecting its refresh under the Clean Power 2030 Framework, and should be read in conjunction with EN-1 and EN-3 to reflect strengthened alignment across energy infrastructure policy

2.1.12 Paragraph 2.3.2 of NPS EN-5 specifies, with regards to climate change adaptation and resilience, applicants must detail the extent to which the Proposed Development is expected to be vulnerable and, where appropriate, how it has been designed to be resilient to flooding, particularly for substations critical to the network.

The National Planning Policy Framework (NPPF)

2.1.13 The National Planning Policy Framework (NPPF) sets out the government's planning policies for England and outlines how these are expected to be applied. In relation to flood risk, the NPPF seeks to minimise vulnerability to flooding and directs development through a sequential, risk-based approach that takes account of current and future flood risk, including the effects of climate change. Sustainable drainage systems (SuDS) are promoted to manage surface water runoff and reduce flood risk where appropriate.

NPPF Planning Practice Guidance (PPG)

2.1.14 Decision makers have the authority to control development in accordance with the guidelines set out in the national PPG. The PPG for Flood Risk and Coastal Change (Ref 2) sets out how flood risk should be considered within the planning system. This guidance includes reference to managing surface water flood risk through appropriate drainage design and mitigation.

2.1.15 The associated PPG on climate change allowances (Ref 3) and on FRAs: applying for planning permission (Ref 4) have also been considered as part of preparing this strategy.

2.1.16 Decision makers are expected to consider the impacts of climate change when determining the suitability of development proposals. The PPG for Climate Change advises that a proactive approach is taken to both mitigating and adapting to climate change through the planning system. This includes taking account of increased rainfall intensity and ensuring the Proposed Development is resilient over its lifetime.

2.1.17 In accordance with PPG, developers are required to consider how climate change is likely to affect flood risk over the lifetime of the development. This includes applying the relevant climate change allowances for rainfall intensity as provided by the EA. These allowances should be factored into drainage calculations and drainage design, ensuring that the development remains safe, resilient, and does not increase surface water flood risk elsewhere.

2.2 Local planning policy

2.2.1 Under the Flood and Water Management Act 2010, the relevant statutory body for all matters related to local flood risk is the LLFA. NYC are the LLFA in the Proposed Development area.

2.2.2 NYC, acting as the Local Planning Authority and Lead Local Flood Authority, have several documents that identify how the issue of flooding is managed within this area as a key planning consideration. The Proposed Development design has sought to align with the policies detailed in these documents.

North Yorkshire Council Strategic Flood Risk Assessment (SFRA)

2.2.3 The adopted SFRA sets out the risks posed by flooding from a range of sources to the defined administrative area. It also provides an evidence base to support planning decisions, including the consideration of surface water flood risk.

2.2.4 Supported by the SFRA, the North Yorkshire County Council Local Plan at the time of this report is currently being prepared. This, once published, will document the vision and framework for the future growth of the district, identifying where development could take place and include policies relevant to environmental considerations such as drainage and climate change adaptation.

2.2.5 The Emerging Selby Local Plan, published prior to local government re-organisation in the area, set out strategic policies for housing, infrastructure, and environmental protection, including climate change mitigation and renewable energy development. Within this, Policy SG10 – low Carbon and Renewable Energy supported proposals for renewable energy generation across the region, such as solar PV, where they are appropriately located and designed to minimise impacts on landscape, heritage, biodiversity, and amenity.

North Yorkshire Council Flood Risk Management Strategy (FRMS)

2.2.6 The Flood Risk Management Strategy (FRMS), implemented in 2022, sets out the council's strategy to better understand the flood risk across the area, and to enable the development of schemes to reduce flood risk within North Yorkshire, and to ensure the area is better prepared for flood events.

2.2.7 The FRMS prioritises sustainable flood risk reduction through community engagement, improved understanding of drainage networks, and integration of SuDS in development. The strategy emphasises climate resilience, coordination between Risk Management Authorities, and alignment with local flood risk management plans. It also includes an action plan for incident response, asset maintenance, and securing funding for mitigation measures.

North Yorkshire Council Local Flood Risk Strategy

2.2.8 The Local Flood Risk Strategy (LFRS) (Ref 9) outlines the LLFA's approach to managing local sources of flood risk, including surface water, ordinary watercourses, and groundwater, and emphasises the importance of sustainable, risk-based development. In line with the LFRS, this drainage strategy identifies appropriate drainage measures that align with the LFRS objectives, including the use of sustainable drainage systems (SuDS) where feasible, to reduce runoff and minimise the risk of flooding both on and off-site.

North Yorkshire Council Sustainable Drainage Systems Guidance

2.2.9 The NYC SuDS Guidance (Ref 10) provides comprehensive criteria for the design and implementation of effective drainage solutions within the county. Key considerations include:

1) The prioritisation of surface water discharge follows a specific hierarchy:
    a) Discharge into the ground (infiltration);
    b) Discharge to a surface water body;
    c) Discharge to a surface water sewer, highway drain, or other drain; and
    d) Discharge to a combined sewer.
2) The requirement for detailed infiltration testing in accordance with BRE 365 standards to assess the viability of on-site infiltration. The NYC Supplementary Infiltration Guidance emphasises the importance of inviting the LLFA to witness these tests and mandates comprehensive reporting.
3) SuDS design should incorporate a sequence of components to control runoff rates and volumes, promoting water quality and biodiversity benefits. This includes source control measures, site control, and regional control techniques.
4) A development should not increase the flood risk on or off-site. SuDS should be designed to protect people, property, and infrastructure from flooding and be economically maintainable for a development's lifetime.

3 Consultation

3.1 Scoping Opinion

3.1.1 An EIA Scoping Report (Appendix 1.1 (ES Volume 3) [**EN0110012/APP/LVS/06.03.01.01**]) was submitted to the Planning Inspectorate (PINS) on 11 November 2024. The EIA Scoping Opinion was issued by PINS on 19 December 2024 (Appendix 1.2 (ES Volume 3) [**EN0110012/APP/LVS/06.03.01.02**]).

3.1.2 Consultation undertaken throughout the pre-application and scoping phases for the Proposed Development has informed the approach to the outline Drainage Strategy.

3.1.3 A summary of key comments from the EIA Scoping Opinion and how these have been addressed is presented in Table 15-5 of Chapter 15: Water Resources and Flood Risk (ES Volume 1) [**EN0110012/APP/LVS/06.01.15**].

3.2 Statutory consultation

3.2.1 A period of statutory consultation took place between 26 June 2025 to 7 August 2025 wherein consultees were able to respond to preliminary environmental information set out in the Preliminary Environmental Information Report (PEIR). Table 15-6 of Chapter 15: Water Resources and Flood Risk (ES Volume 1) [**EN0110012/APP/LVS/06.01.15**] outlines the statutory consultation responses relating to water resources and flood risk and how these have been addressed through the ES.

3.2.2 Responses to the Statutory Consultation are outlined in the Consultation Report [**EN0110012/APP/LVS/05.1**].

3.2.3 Meetings were held with the Environment Agency (EA) and the Ouse and Derwent Internal Drainage Board (IDB) to review key aspects related to flood risk and surface water management. A summary of key consultation points as they relate to surface water management from these meetings is provided below in Sections 3.3 and 3.4, respectively.

3.2.4 Both the Selby Area IDB and North Yorkshire Council as the LLFA were invited to participate in consultation. Selby Area IDB did not respond to requests to meet, and North Yorkshire Council, acting as Lead Local Flood Authority (LLFA), declined a meeting, opting instead to provide comments through the Statutory Consultation process, as outlined in the Consultation Report and summarised here.

3.2.5 The LLFA advised the Applicant to review the North Yorkshire SuDS Guidance, which sets out design expectations and requirements for sustainable drainage systems, and to follow the Drainage Hierarchy alongside supplementary infiltration testing guidance to ensure infiltration feasibility is properly assessed – this has informed the outline Drainage Strategy contained in Section 5. They also advised that applications should address key elements including flood risk, runoff

destinations, peak flow and volume control, designing for exceedance, climate change, urban creep and a maintenance plan, with detailed requirements provided within the SuDS Guidance – this has been done as relevant in this outline Drainage Strategy. They noted that all drainage schemes must comply with the standard design parameters specified by the LLFA.

3.2.6 The LLFA also confirmed that whilst they hold no records of flooding in the vicinity of the proposed development, this does not confirm flooding has never occurred, as incidents may not have been reported.

3.2.7 A summary of stakeholder engagement held to date is provided in Table 15-7 of the Chapter 15: Water Resources and Flood Risk (ES Volume 1) [**EN0110012/APP/LVS/06.01.15**].

3.3 Environment Agency

3.3.1 Following receipt of the EIA Scoping Opinion, several meetings with the Environment Agency (EA) were held which focused primarily on agreeing the approach and methodology for the site-specific flood risk assessment, including hydraulic modelling, climate change allowances, finished floor level requirements and sensitivity testing.

3.3.2 Several matters relating to surface water drainage were also discussed during consultation held with the EA following submission of the PEIR throughout June – August 2025 which are covered in detail in this outline Drainage Strategy.

3.4 Internal Drainage Boards

3.4.1 The Order Limits include areas within two Internal Drainage Board (IDB) Districts. The first is the Ouse and Derwent IDB District, which contains Solar Development Site 1. The second is the Selby Area IDB District which contains Solar Development Sites 2 – 4 and 6 – 8. The Cable Route Corridor runs through both IDB districts.

3.4.2 During the period of statutory consultation, a meeting was held with the Ouse and Derwent IDB to provide responses to and discuss the IDB's consultation comments.

3.4.3 The IDB agreed to the proposed 10 m buffer for all watercourses and confirmed that surface water runoff rates are to be restricted to 1.4 l/s/ha or a minimum of 1 l/s, and the treatment of site surfaces in relation to surface water drainage as follows:

1) PV areas to be treated as permeable.
2) BESS/substations to be treated as impermeable with SuDS to be proposed.
3) Access track permeability was clarified, with Type 1 to be treated as impermeable and Type 3 to be treated as permeable.

3.4.4 Consultation with the IDBs also covered the approach to both temporary and permanent watercourse crossings, including requirements for trenchless

methods, culvert design principles and the Land Drainage consenting process and this is discussed within the FRA (ES Volume 3) [**EN0110012/APP/LVS/06.03.15.01**].

4 Proposed Development

4.1 Site description

4.1.1 The Proposed Development is shown in Figure 1.1: Site Location Plan and Order Limits (ES Volume 2) [**EN0110012/APP/LVS/06.02.01.01**]).

4.1.2 The total area within the Solar Development Sites is approximately 900.2 ha. The current land use is predominantly arable farmland and pastoral land with associated smallholdings, with some highways passing through the Order Limits.

4.1.3 The Cable Route Corridor is typically 50 m wide but widens in a number of locations for utility, road and river crossings. The exact location of the Grid Connection Cables and Interconnecting Cables within the Cable Route Corridor will be determined at the detailed design stage. The Cable Route Corridor Construction method statement provides further details on this (Appendix 2.1: Cable Route Method Statement (ES Volume 3) **[EN0110012/APP/LVS/06.03.02.01])**. The Solar Development Sites are split across a total of seven land parcels as presented in Figure 2.1: Illustrative Site Layout Plans (ES Volume 2) [**EN0110012/APP/LVS/06.02.02.01**]).

4.1.4 The Cable Route Corridor consists of nine separate corridors, predominantly crossing agricultural land with local farm holdings. In some areas, the Cable Route Corridor is crossed by highways (including the A19 and A63), rail lines, and the Selby Dam and River Ouse and associated flood defences. Each Cable Route Corridor (CRC) is named corresponding to the Solar Development Sites in which they connect, outlined as follows: CRC 1-4 and 1-4a, CRC 2-4, CRC 2-6, CRC 3-4 and 3-4a, CRC 6-7, CRC 2-8, and CRC 4-POC. The Cable Route Corridors are further described Annex H of the FRA (ES Volume 3) [**EN0110012/APP/LVS/06.03.15.01**] and an assessment of interactions between the Cable Route Corridors with EA flood defence assets is also provided.

4.1.5 The watercourses and topography (LIDAR Digital Terrain Model (DTM)) are shown on Figure 15.1: Surface Water Features (ES Volume 2) **[EN0110012/APP/LVS/06.02.15.01]**, on which those that are designated as a 'main river' are also indicated. Given the broad spatial extent of the Order Limits, the topography varies substantially. Numerous watercourses are present within the Study Area, including main rivers designated by the EA, IDB watercourses, and ordinary watercourses.

4.1.6 The main rivers in the Study Area are the River Aire, River Ouse, and Selby Dam. The Order Limits spans across two IDB areas: the Selby Area IDB and the Ouse and Derwent IDB.

4.1.7 NYC is the LLFA for the Proposed Development and is responsible for managing and maintaining ordinary watercourses within its jurisdiction that are not under the authority of the IDB.

4.2 Proposed Development

4.2.1 The Proposed Development is a NSIP as it would generate over 100 MW of electricity. It will support national and local decarbonisation and Net Zero targets and improve energy security.

4.2.2 The Proposed Development includes the construction of solar PV with BESS and other associated infrastructure. There are seven Solar Development Sites (1-4, 6-8).

4.2.3 The Design Parameters utilised in this outline Drainage Strategy are described in Table 2-1 within Chapter 2: The Proposed Development (ES Volume 1) [**EN0110012/APP/LVS/06.01.02**].

4.2.4 Solar PV panels will either be of a tracking (Option A) or fixed (Option B) design with a minimum clearance between the ground and the bottom of a solar PV panel of 0.4 m. If a tracking type is used, the maximum height when horizontal or in a 'stow' position is 2.5 m above ground level. Solar PV Panels of either type would be positioned in rows with a minimum separation distance of 2.5 m.

4.2.5 Solar PV panels will be mounted on metal frames and secured via metal posts driven into the ground. The exception to this is in areas where archaeological protection may be required, where other non-ground penetrating techniques, including concrete footings, may be used to secure the mounting structure to the ground. 5.6% of the total Solar PV panel areas will require concrete footings or equivalent.

4.2.6 The Proposed Development includes three 275 kV substations within the ES Assessment Area. The locations of these substations have now been confirmed (shown on the Works Plans in [**EN0110012/APP/LVS/02.03**]) and are situated on Solar Development Sites 1, 2, and 4, within the areas illustrated on Figure 2.1: Illustrative Site Layout Plans (ES Volume 2) [**EN0110012/APP/LVS/06.02.02.01**]. Each substation will occupy a defined area within these sites, with a maximum compound footprint of approximately 3.5 ha.

4.2.7 The Proposed Development also includes for Integrated Conversion Units (ICUs) across the Solar Development Site PV areas. For the purposes of assessment, the ICUs are interchangeable with 33 kV switch rooms of equivalent dimensions and referred to as ICUs in this assessment. The indicative (but not finalised) locations of these are shown in Figure 2.1: Illustrative Site Layout Plans (ES Volume 2) [**EN0110012/APP/LVS/06.02.02.01**] and will be subject to ongoing design development.

4.2.8 It is assumed that the foundations for ICUs or switch rooms will take the form of a concrete raft. The ICUs are anticipated to have maximum foundation dimensions of 16 m x 6 m and a maximum height of 3.5 m.

4.2.9 For Solar Development Site 1, the maximum compound area for the on-site 275kV substation is 1.0 ha, whereas for Solar Development Sites 2 and 4, the maximum compound area is 3.5 ha. Each substation will have a maximum height of 13 m to the top of the busbars. Foundations are expected to take the form of a concrete raft up to 2.5 m deep or piled foundations up to 15 m deep.

4.2.10 Supporting infrastructure in the form of BESS also forms part of the Proposed Development. The BESS Compound is to be located on Solar Development Site 2 and will have a maximum compound area of 10.5 ha. Each enclosure will measure 16 m x 3 m, with a maximum height of 3.5 m AGL. For the purposes of this assessment, a worst-case assumption has been made that the BESS Enclosures will be founded on concrete pads, although other types of foundation may be possible.

4.2.11 Measures relating to flood risk and the resilience of the Proposed Development, including minimum finished floor levels and the approach to locating and protecting flood-sensitive infrastructure, are set out within the FRA (ES Volume 3) [**EN0110012/APP/LVS/06.03.15.01**].

4.2.12 The Solar Development Sites will be connected to each other and the substations via underground cables, located within the Cable Route Corridor (shown on Figure 15.14: Spatial Flood Defences (ES Volume 2) **[EN0110012/APP/LVS/06.02.15.14]**.

4.3 Development type and vulnerability classification

4.3.1 The NPPF classifies all types of development in accordance with their vulnerability to flood risk, to steer vulnerable developments into areas of lowest flood risk. The Proposed Development involves the construction of solar PV and associated infrastructure for the purpose of energy generation and distribution, which is listed under NPPF as 'Essential infrastructure'. Further information is set out within the FRA (Appendix 15.1 (ES Volume 3) [**EN0110012/APP/LVS/06.03.15.01**]).

4.3.2 This outline Drainage Strategy assumes an operational life of up to 60 years, including construction and decommissioning, resulting in a lifetime beyond 2080. Given the status of the Proposed Development as an NSIP, the consideration of later climate epochs up to the 2080's epoch (2070-2125) is required.

4.4 Climate change

4.4.1 NPS EN-1 confirms the need to factor the effects of climate change into any FRA. 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) (Ref 18) should be used to ensure appropriate mitigation or adaptation measures are identified to cover the estimated lifetime of the Proposed Development.

4.4.2 The EA Guidance provides climate change allowances (predictions of anticipated change), and those relevant to the Proposed Development are the allowances for:

1) Peak river flow; and
2) Peak rainfall intensity.

4.4.3 For peak rainfall intensity, the peak rainfall allowances map (Ref 18) shows the anticipated changes in peak rainfall intensity to be used for site-scale applications, such as drainage design. The peak rainfall allowances for both catchments are provided for the 2070s epoch in Table 4-1 below.

Table 4-1 Management catchments within the Order Limits – peak rainfall allowances

Management catchment	3.3% annual exceedance rainfall event 2070s	1% annual exceedance rainfall event 2070s
Wharfe and Lower Ouse	Central allowance = 25% Upper end allowance = 40%	Central allowance = 30% Upper end allowance = 40%
Aire and Calder	Central allowance = 25% Upper end allowance = 40%	Central allowance = 25% Upper end allowance = 45%

Note: The 2070s epoch is used for development with a lifetime between 2061 and 2125.

5 Outline Drainage Strategy

5.1 Introduction

5.1.1 This section provides an outline Drainage Strategy for the Proposed Development.

5.1.2 This outline Drainage Strategy details how surface water will be managed during the operational phases of the Proposed Development. It also considers foul and surface water drainage requirements in the temporary scenario, including during the construction phase.

5.1.3 The drainage strategy has also been developed with regard to pollution prevention requirements set out in NPS EN-1, including the need to incorporate appropriate design and management measures to control runoff quality and prevent contamination of receiving waterbodies.

5.1.4 A summary of surface water drainage proposals for the different elements of the Proposed Development is provided in the following sections. This includes a review of the proposed surface water outfall arrangements as well as attenuation volume calculations for the management of surface water runoff.

5.1.5 An outline Construction Environmental Management Plan (oCEMP) [**EN0110012/APP/LVS/07.02**] and an Operational Environmental Management Plan (OEMP) [**EN0110012/APP/LVS/07.03**] have also been prepared and includes measures such as those detailed in the following sections for the Solar PV areas, BESS, substations and transformers and access roads.

5.2 Surface water discharge arrangements

Discharge hierarchy

5.2.1 The prioritisation of surface water discharge follows a specific hierarchy, as set out in the Building Regulations Part H (Ref 11) and reinforced through national and local SuDS policies (including North Yorkshire Council SuDS guidance).

5.2.2 The new non-statutory National Standards for SuDS guidance (Ref 14) also sets out an updated list of priority runoff destinations in Standard 1, which now includes collection for non-potable uses. Therefore, the recommended hierarchy for surface water discharge is as follows:

1) Collection for non-potable use;
2) Discharge into the ground (infiltration);
3) Discharge to a surface water body;
4) Discharge to a surface water sewer, or other surface water system; and
5) Discharge to a combined sewer.

5.2.3 The Proposed Development will consider opportunities for the collection of surface water for non-potable uses where practical. The use of rainwater

harvesting systems serving clean roof areas could support non-potable water demand, reduce reliance on potable supplies, and contribute to source control principles by reducing runoff volumes.

5.2.4 For the Proposed Development, roof areas are largely limited to substations, however, these areas could provide a source of clean rainwater suitable for harvesting.

5.2.5 The discharge hierarchy promotes infiltration as the first consideration for where runoff is directed, and it is considered that this would be pursued as the primary method of surface water disposal used for the Proposed Development.

5.2.6 In accordance with national policy and the drainage hierarchy, infiltration should be pursued as the primary means of surface water disposal wherever feasible. To determine viability, site-specific infiltration testing must be undertaken in accordance with BRE Digest 365, supported by the requirements of the NYC Supplementary Infiltration Guidance, which highlights the importance of inviting the LLFA to witness the tests and providing comprehensive reporting of the results.

5.2.7 Should infiltration be demonstrated to be unfeasible following testing to BRE 365, the drainage hierarchy will be followed and a suitable outfall to a watercourse will be identified as the next preferred option. If no viable watercourse connection exists, then discharge to the public sewer network would be considered as the final resort.

Runoff control

5.2.8 Effective runoff control is essential for managing surface water safely, reducing flood risk both on and off-site, and protecting receiving waterbodies.

5.2.9 The outline drainage strategy follows the preferred discharge hierarchy: discharge via infiltration, followed by discharge to a watercourse or receiving water body. Only if these routes are not practical should discharge to a surface water sewer or highway drain be pursued, or to a combined sewer if no other outfall is available, subject to capacity and the agreement of the asset owner.

5.2.10 According to the updated national standards for SuDS guidance, in England, drainage designs should aim to retain the initial 5mm of everyday rainfall on-site (known as interception) for 80% of summer events and 50% of winter events. Interception mimics the natural drainage process, where water is managed as close to the source as practicable either through infiltration, evapotranspiration, and / or absorption.

5.2.11 Interception can be achieved through infiltration or through mechanisms such as evapotranspiration, storage, and retention within vegetated or engineered systems. This loss can also be mimicked through water reuse, which, while it does not in itself constitute interception, it can make a valuable contribution by reducing runoff volumes and supporting the principle of managing rainwater as a resource in line with the SuDS approach.

5.2.12 Runoff control is achieved through attenuation, with excess surface water stored on-site and released at a rate that does not exceed the allowable discharge. Even infiltration systems require storage to buffer inflows and manage the rate at which water can discharge into the ground. If infiltration is not practicable as the sole means of discharge, the system must rely on attenuation to restrict flows to the allowable rate and provide a controlled outfall to an appropriate receiving waterbody or sewer.

Discharge rates

5.2.13 In accordance with the drainage hierarchy, infiltration must be considered as the primary means of surface water disposal and may only be discounted following site-specific infiltration testing in accordance with BRE Digest 365 and LLFA guidance.

5.2.14 Attenuation features will need to be designed to collectively accommodate runoff for events up to and including the 1 in 100-year plus climate change event.

5.2.15 Infiltration must first be ruled out via site specific testing. An assumed worst-case infiltration rate of 1×10^{-7} m/s has been adopted for early calculations based on the anticipated ground conditions, which have been informed by the MAGiC map and Soilscapes classifications.

5.2.16 It should be noted that The SuDS Manual (CIRIA ~~C735~~C753) notes that although infiltration rates lower than 1×10^{-6} m/s can still be viable for infiltration-based drainage, they can substantially limit the ability to dispose of larger volumes of runoff. Under such conditions, achieving effective infiltration typically requires an increased plan area, which can materially improve performance.

5.2.17 Where an outfall to a watercourse is considered appropriate, discharge must be restricted to greenfield runoff rates for an ordinary watercourse or to 1.4 l/s/ha for an IDB-controlled watercourse (subject to a minimum rate of 1.0 l/s). The calculated permissible discharge rates are presented in Table 5-1.

Table 5-1 Calculated surface water discharge rates to watercourse or sewer

Proposed Development element	Solar Development Site	Catchment area (ha)	Discharge condition (l/s/ha)	Calculated discharge rate (l/s)
275 kV substation	SDS 1 – within field 1.19	0.98	1.4	1.4
275 kV substation	SDS 2 - within field 2.4	2.97	1.4	4.2
BESS Compound	SDS 2 - within field 2.4	7.6	1.4	10.6
275 kV substation	SDS 4 – within field 4.4	3.05	1.4	4.3

Design parameters

5.2.18 The assessment of attenuation requirements considers the range of storm events that could affect the site, providing a basis for designing storage volumes that accommodate peak flows while supporting sustainable drainage objectives. NYC has provided a summary table of design parameters to be used for future drainage design. These are summarised below in Table 5-2.

Table 5-2 Drainage design parameters

Design consideration	Design parameter
Minimum Slope	1:500
Roughness Value (K) – manning 'n' (only to be used for open channels).	0.5 mm
Minimum System Velocity	1.0 m/s
Urban Creep	10%
Maximum Drained Area for Gullies	150 m^2
Highway Drains Minimum Cover	1.2 m
Minimum Pipe Diameter	150 mm
Percentage Impermeable Area	100% for compliance with Sewers for Adoption
Margin for Flood Risk Warning	300 mm
Area Reduction Factor	1
Time of Entry	3-5 minutes
Return Period	1, 30, 100 as a minimum

Attenuation

5.2.19 Attenuation is a key component of the surface water drainage strategy for the Proposed Development, ensuring that runoff from impermeable surfaces is managed in a controlled manner.

5.2.20 Infiltration potential has a direct influence on attenuation requirements. Higher infiltration rates allow runoff to infiltrate during storm events, reducing the overall storage volume. Conversely, low or negligible infiltration lead to a greater proportion of runoff needing to be attenuated, resulting in increased storage volumes.

5.2.21 Given the Proposed Development assumed infiltration rate of 1×10^{-7} m/s, and the anticipated limited infiltration potential, attenuation calculations have been carried out for three scenarios: full infiltration, partial infiltration, and no infiltration.

5.2.22 Furthermore, a comparison of different hydrological approaches has been carried out to ensure that the calculations represent a conservative, worst-case scenario. The Flood Estimation Handbook (FEH) approach has been used to calculate attenuation volumes. Both the FEH and Flood Studies Report (FSR) methods were tested, and the FEH approach was found to produce the larger (worst-case)

attenuation requirements for the Proposed Development. FEH has therefore been adopted for the assessment.

5.2.23 Indicative attenuation volumes have been calculated conservatively using the maximum anticipated compound areas described in Table 2-1 within Chapter 2: The Proposed Development (ES Volume 1) [**EN0110012/APP/LVS/06.01.02**]. A summary of anticipated attenuation volumes is provided in Table 5-3.

Table 5-3 Summary of attenuation volumes

Proposed Development element	Solar Development Site	Catchment area (ha)	Calculated discharge rate (l/s)	Scenario	Anticipated attenuation volumes (m^3)
275 kV substation	SDS 1 – within field 1.19	1	1.4	Infiltration only	1020 – 1081
				No infiltration	964 – 1049
				Partial infiltration	906 – 1044
275 kV substation	SDS 2 - within field 2.4	3.5	4.9	Infiltration only	3699 – 3918
				No infiltration	3508 – 3806
				Partial infiltration	3300 – 3790
BESS Compound	SDS 2 - within field 2.4	10.5	14.7	Infiltration only	11,097 – 11,753
				No infiltration	10,525 – 11,418
				Partial infiltration	9899 – 11,371
275 kV substation proposed	SDS 4 – within field 4.4	3.5	4.9	Infiltration only	3699 – 3918
				No infiltration	3508 – 3806
				Partial infiltration	3300 – 3790

5.2.24 The attenuation volumes presented are indicative and have been derived from Figure 2.1: Illustrative Site Layout Plans (ES Volume 2) [**EN0110012/APP/LVS/06.02.02.01**] and the design parameters outlined above. Their purpose at this stage is to demonstrate the feasibility and approximate scale of storage likely to be required, and to inform the design team of the considerations relevant to identifying potential locations for attenuation features within the developable area.

5.2.25 These values provide an initial basis for determining potential locations for attenuation features, subject to future infiltration testing and detailed ground investigation. The final attenuation design and feature selection and siting will be confirmed at the detailed design stage, once this information is available and

detailed site layouts are confirmed. This approach ensures that sufficient flexibility is retained for the detailed drainage design while demonstrating that an appropriate surface water attenuation strategy can be delivered.

5.2.26 Final selection, details, and planting proposals for individual SuDS features will be developed in coordination with landscape and ecological proposals at detailed design. SuDS features will be designed, where possible, to maximise opportunities for multifunctional benefits whilst ensuring that the required drainage function and performance are maintained.

~~5.2.26~~5.2.27 Given the setting of the Proposed Development, it is considered that the land take required to accommodate appropriately sized infiltration features can be achieved, and that infiltration therefore remains a feasible option notwithstanding the assumed infiltration rate used at this stage. This assumption will, however, be subject to confirmation through site-specific infiltration testing carried out in accordance with LLFA guidance and will be balanced against the associated land take requirements and any potential interaction with other elements of the Proposed Development. The confirmed approach will be set out in the detailed drainage strategy put forward for approval post DCO consent.

5.3 Solar PV areas

5.3.1 The Proposed Development comprises seven Panel Areas (groups of solar PV panels) across Solar Development Sites 1-4 and 6-8.

5.3.2 Presently it is assumed that the Solar Development Sites drain naturally following the topography towards watercourses with some losses into the ground. Existing subsurface field drainage systems are also present.

5.3.3 Formal soakaway systems are deemed unnecessary for the Solar PV areas. It is proposed that surface water will drain freely off the panels onto the surrounding vegetated ground, promoting natural land drainage around the structures.

5.3.4 This method is considered appropriate as the solar panels are anticipated to be ground-mounted and secured via metal poles, elevated above the ground, and do not cover the entire ground area. Surface water is proposed to be managed according to the existing conditions, with no introduction of hard infrastructure such as pipework, manholes or storage features.

5.3.5 This approach is supported by NPS EN-3, the Ouse and Derwent IDB (as detailed in Table 15-6 of Chapter 15: Water Resources and Flood Risk (ES Volume 1) [**EN0110012/APP/LVS/06.01.15**]), and previous studies, including a paper within the Journal of Hydrologic Engineering on the hydrological implications of solar farms (Ref 20). The study concluded that solar panels should not have a significant impact on run-off volumes, peak rates or time to peak rates, providing the ground beneath them remains well vegetated. It considered factors such as soil type, slope angle, and rainfall intensity, concluding the ground cover has the greatest impact on runoff rates.

5.3.6 The nature of the underlying groundcover will have a demonstrable influence on the surface water runoff characteristics in the Solar Development Sites. Grass or

wildflower cover will be present across the Solar PV areas of the Solar Development Sites to ensure that the Proposed Development does not increase the surface water runoff, volume, or time to peak compared to pre-development conditions.

5.3.7 As it is proposed to mimic the existing greenfield runoff response within the Solar Development Sites by allowing surface water to drain freely from the panels, it is considered that infiltration testing is not required to confirm the drainage strategy for these areas. This approach is considered to be proportionate given the type and scale of the Proposed Development.

5.3.8 Measures outlined within the Soil Resource Management Plan (SRMP) **[EN0110012/APP/LVS/07.14]** have been considered to both minimise ground compaction and ensure remedial action is undertaken where ground is compacted, particularly below the proposed panels prior to them being installed. Utilising grass or wildflower cover will help to enhance interception and root growth, promoting effective rainwater infiltration and interception.

5.3.9 Considering the current site comprises arable and pasture farmland, ceasing grazing or arable activities and enhancing vegetation is expected to improve the existing greenfield conditions within the Solar Development Sites. As long as vegetation beneath the solar arrays is retained, no significant increase in surface water runoff is anticipated from the installation of the solar PV areas when compared to the existing scenario.

5.3.10 Rutting during the operational phase can be an issue at solar farm sites, particularly during intense storms, at the base of panels. This can disrupt natural flow paths and would be avoided wherever practicable through adequate planting and maintenance of the vegetation. Any areas that may be accessed by maintenance equipment or machinery would be managed to ensure rutting of the surface is avoided or repaired where necessary.

5.3.11 The arrangement of Solar PV panels will incorporate regular gaps between individual modules, facilitating the even distribution of surface water across the arrays. This prevents the concentration of runoff at the lower edges of the panels, thereby reducing the risk of localised erosion and promoting more uniform infiltration.

5.3.12 Any areas requiring access by maintenance equipment or machinery would also be managed to ensure rutting of the surface is avoided or repaired where necessary. Solar PV Panels would be positioned in rows with a minimum separation distance of 2.5 m at the closest point.

5.3.13 Additionally, the runoff quality from the Panel Areas is expected to be comparable to that from roofs, so no extra water quality treatment measures are deemed necessary beyond that provided by the grass cover beneath the panels.

5.4 Battery Energy Storage Systems (BESS)

5.4.1 The Proposed Development includes a BESS Compound located in field 2.4 of Solar Development Site 2.

5.4.2 With reference to the design parameters outlined in Chapter 2: The Proposed Development (ES Volume 2) [**EN0110012/APP/LVS/06.01.02**], the BESS will have a maximum compound area of 10.5 ha and each BESS Enclosure will measure 16 m x 3 m.

5.4.3 For the purposes of assessment, a worst-case assumption has been made that the BESS enclosures will be founded on concrete foundations, although other types of foundation may be possible, depending on ground conditions.

5.4.4 Similar to the solar arrays, the BESS will receive direct rainfall but are not expected to generate pollutant loads under normal operational conditions. Maintenance operations are considered to pose minimal pollution risks, and no other planned maintenance activities are known that may present an increased risk of pollution to the water environment.

5.4.5 An embedded mitigation measure for the Proposed Development includes the requirement for firewater containment from the BESS Compound.

5.4.6 As a first line of defence, numerous safety measures are proposed to prevent a fire occurring within the BESS. An outline Battery Safety Management Plan (oBSMP) [**EN0110012/APP/LVS/07.06**] is included within the DCO Application, which sets out key measures to minimise the risk of a battery fire and prevent the spread of fire.

5.4.7 If an internal water-based fire suppression system is provided within each of the BESS enclosures, this will include a separate water supply, internal drainage system, and segregated fire water containment system which will be isolated from the site drainage network. Segregation of the internal drainage systems will reduce the risk of contaminated fire water entering the wider drainage network in the event of a fire. Testing of any water contained within the containment tanks following a fire would be carried out prior to the water being removed via tanker and treated off-site, ensuring it is handled in accordance with the relevant environmental legislation and best practice.

5.4.8 The BESS design principles set out in the oBSMP [**EN0110012/APP/LVS/07.06**] indicate that a defensive firefighting strategy will be employed for the BESS, consisting of boundary cooling to minimise pollution risk and direct firefighting tactics are not proposed. The National Fire Chief's Council (NFCC) guidance states that if the recommended firefighting tactic for a BESS fire is to defensively firefight and boundary cool, whilst allowing the BESS to consume itself, this will reduce the water requirements, and thus the drainage and environmental protection requirements significantly.

5.4.9 There is a risk that the water used for boundary cooling may become contaminated, in the event of any leaks from the BESS enclosures. A secondary containment system will be provided on the external surface water drainage system, allowing isolation of the system and sufficient storage to contain any water used in the boundary cooling process.

5.4.10 Secondary containment may be achieved either within the surface water attenuation or through a separate containment system that would include a high-

level overflow to the surface water system in the event of a concurrent rainfall and fire event for redundancy. The BESS drainage system will be fully sealed (impermeably lined) to prevent infiltration. The oBSMP recommends that a total allowance of four hours of boundary cooling water usage is required as containment storage.

5.4.11 Secondary containment systems may take the form of impermeable lagoon(s) or tanks. Automated shut-off valves that are linked to the BESS fire alarm system will isolate the drainage network from the firewater containment system during a fire event. During standard operation, the self-actuating valves will be open to allow surface water runoff to discharge to the downstream network under normal operation. A manual back-up shut-off valve system allowing for redundancy will also be integrated. Regular checking and maintenance of drainage isolation devices associated with fire water containment will be undertaken to ensure they are operational when needed and not seized.

5.4.12 In the event of a fire, the valves would be triggered by the fire alarm system to prevent any potentially contaminated runoff entering the downstream drainage network or wider water environment. Following a fire event, when safe to do so, samples of the contained firewater runoff will be taken by a suitably competent person and submitted to a UKAS accredited laboratory for analysis using UKAS and MCERTS accredited methods, where applicable. The samples will be analysed to determine the presence and concentration of contaminants and checked against the hazardous substances listed in the 'surface water pollution risk assessment for your environmental permit' guidance (Ref 58). The contained runoff will not be removed or discharged until the results have been reviewed and the appropriate disposal route is confirmed. In the event of contamination, the drainage isolation device will not be reopened until appropriate cleaning of the drainage system has been undertaken. The retained firewater will be disposed of by a licensed tanker off-site where contamination is confirmed, prior to the valve being manually re-opened to resume normal operation.

5.4.13 Water levels and the available containment capacity will be monitored following an incident, taking into account forecast rainfall. Following an incident, sampling will be undertaken as soon as practical and, where the removal of retained firewater is required to maintain adequate available containment capacity prior to receipt of testing results, any contained water will be managed as potentially contaminated and removed by tanker for disposal. The detailed BSMP and drainage design will define any operational trigger levels and procedures for managing this residual risk.

5.4.14 As the discharge of contaminated firewater to the environment is not permitted without an Environmental Permit, only water confirmed as uncontaminated and safe for release would be discharged in a controlled manner to the local drainage network. This approach ensures that environmental protection is maintained under both normal and emergency conditions. ~~The requirement~~Where firewater requiring management is present, the need for ~~such~~ an Environmental Permit would be identified and ~~progressed at detailed design once final drainage~~

~~arrangements are confirmed, and prior to commencement of the regulated activity.~~, if required, an application would be made..

5.4.15 The use of subsurface gravel systems for surface water attenuation and firewater containment is not recommended, due to subsequent issues with managing residual contamination in the gravels after a fire event.

5.4.16 It is noted in the oBSMP [**EN0110012/APP/LVS/07.06**] that the fire service may seek to re-use firefighting water, stored in the containment system, whilst employing the boundary cooling measures. There is therefore a preference for any containment to be sited in reasonable proximity to but not within 10 m of the BESS, with a maximum distance of 25 m recommended. The containment system should also be located upwind of the prevalent wind direction to facilitate safe access and egress for the fire service and water quality testing.

5.4.17 There is also a possibility that a fire may coincide with a rainfall event. Any runoff emanating from the BESS Compound during or following a fire must be effectively contained and subsequently tested for contamination. The proposed containment system must therefore also be appropriately sized for the 1 in 100-year plus climate change design event to prevent the untreated discharge of contaminated firewater to surface or groundwaters.

5.4.18 An appropriate containment volume will be agreed with North Yorkshire Fire and Rescue Service (NYFRS) during subsequent design stages.

5.4.19 Onward movement through a SuDS-based drainage system would be required for surface water downstream of the containment system. This could take the form of an open swale conveyance system discharging either to, in order of preference, an infiltration system (e.g. an infiltration basin), watercourse, or surface water sewer. Whilst in a normal operational scenario, runoff from the BESS Compound is not expected to generate additional pollutant loads, providing conveyance through a swale system would provide further water quality benefits prior to discharge.

5.4.20 Should an outfall from the BESS Compound to a watercourse be proposed, the containment system may serve a dual purpose as an attenuation system, limiting discharge to greenfield discharge rates for an ordinary watercourse or 1.4l/s/ha for an IDB watercourse during events up to and including the 1 in 100-year plus climate change design event. Climate change allowances for peak rainfall in the Aire and Calder catchment are provided in Table 4-1.

5.4.21 The drainage team will note these stipulations and work with the design team of the BESS to ensure these points are taken forward and recognised in the detailed design of the BESS.

5.4.22 Infiltration is anticipated to provide a viable means of surface water discharge from the BESS development. However, infiltration rates can vary substantially across a site and as such, given the size and location of the BESS development, it is recommended that site-specific infiltration testing in accordance with BRE 365 be carried out alongside a detailed proposed layout to inform the location of any infiltration features.

5.4.23 If infiltration is subsequently proven to be an unviable means of surface water discharge, consideration would then be given to discharge to watercourse subject to agreement with the approving authority. There appear to be no adopted sewerage assets in proximity to the BESS area on Solar Development Site 2.

5.4.24 ~~Consideration~~A risk assessment and options appraisal will ~~also~~ be ~~given~~ undertaken at detailed design to ~~the need for~~establish whether additional water quality monitoring at outfalls from the BESS Compound~~. Any monitoring considered appropriate~~, including the potential use of sensor-based systems, is required. The findings and any proposed monitoring measures will be ~~specified at detailed design stage as part of~~included in the detailed drainage strategy~~.~~.. Other pollution prevention measures such as oil and chemical spill kits will also be available on site.

5.5 Substations and transformers

5.5.1 The Proposed Development includes three 275 kV substations within the Order Limits.

5.5.2 The proposed 275 kV substations vary in size across the development sites, with Solar Development Site 1 accommodating a maximum compound area of approximately 1 ha, and Solar Development Sites 2 and 4 each extending up to 3.5 ha.

5.5.3 A reasonable worst-case scenario has been assessed for the foundation design, including raft foundations with depths of up to 2.5 m or piled foundation depths of up to 15 m. These foundation types are not expected to materially affect the surface water drainage design or assessment at the ES stage, although they may influence groundwater movement, which is considered separately in Chapter 15: Water Resources and Flood Risk (ES Volume 1) [**EN0110012/APP/LVS/06.01.15**].

5.5.4 The maximum area associated with the integrated conversion units (interchangeable with 33 kV switch-rooms) is assumed to be 15 m x 5 m. These units will be supported by concrete foundation slabs, strips, or footings measuring up to 16 m by 6 m, incorporating a levelling layer of aggregate with a maximum depth of 0.8 m. In locations where non-ground penetrative construction is required, a concrete plinth may be placed on topsoil to minimise disturbance to underlying ground conditions.

5.5.5 The concrete bases of smaller electrical infrastructure associated with the Solar PV areas will be surrounded by gravel filled trenches to control surface water runoff and promote infiltration. The footprint of these features is minimal compared to the total development area.

5.5.6 Substations can inherently pose a high pollution risk due to the storage and potential occasional decanting of oil/fuel, and as such, special consideration must be given to the drainage of these areas. Under The Control of Pollution (oil storage) (England) Regulations (2001) (Ref 12) it is an offence to cause or

knowingly permit the discharge of poisonous, noxious or polluting matter into surface and groundwaters.

5.5.7 The drainage design related to higher risk areas must ensure adequate collection, containment, and treatment is provided for runoff during both normal operation, refuelling, and spill scenarios. This includes the provision of segregated drainage systems to avoid cross-contamination.

5.5.8 National Grid guidance document SD2A/0 for 132 kV connections provides further information on oil containment in Section 14.9 (Ref 19). The document states that all oil filled plant shall incorporate a bund designed to accommodate at least 120% of the oil volume if exposed to rainwater.

5.5.9 Transformers are often exposed and any rainwater collected within a sump should be removed using specialised Bund Water Control Unit pumps that automatically shut off if they detect the presence of oil. These pumps are normally connected to control and monitoring systems that will raise alarms if oil is detected. Under normal conditions, surface water from the bund can be discharged to a foul or combined sewer, or to a surface water sewer via a suitable interceptor. Where no mains drainage is available, treated surface water can be discharged via soakaway providing appropriate containment and management measures are in place.

5.5.10 The detailed drainage design will make provision for the containment of potentially contaminated runoff arising from a reasonable worst-case pollution incident, including a fire involving oil-filled electrical plant (e.g. transformers). The drainage network will also incorporate appropriate means of isolation to prevent the uncontrolled release of potentially contaminated water to surface or groundwaters, unless demonstrated to be safe following appropriate testing, applying the principles set out in paragraphs 5.4.11 – 5.4.12.

5.5.11 In the event of a reasonable worst-case ~~scenario~~pollution incident at the substations, such as a fire involving an oil-filled transformer, potentially contaminated firewater will be retained on-site. The required containment measures will be determined at detailed design through a risk-based assessment undertaken in accordance with relevant good practice, such as CIRIA C376 '*Containment systems for the prevention of pollution'*. The required firewater containment measures and capacity will be determined at detailed design, taking account of anticipated firewater volumes and available containment within the transformer bunds. Where available containment volumes are insufficient, additional containment will be provided.

5.5.12 The drainage design will consider the NPPF and other technical guidance documents as the design for the Proposed Development evolves. This includes the Environment Agency's 'Pollution prevention for businesses' available on GOV.UK, which has replaced the previous pollution prevention guidance (PPG) series. Reference is made, where relevant, to the now withdrawn guidance set out in PPG3 (Use and design of oil separators in surface water drainage systems), recognising that this has been superseded but may still inform good practice, CIRIA C736, and GPP3 18 (Managing Firewater and Major Spillages).

5.5.13 Other areas of hardstanding associated with the substations, which pose a low pollution risk, can be managed through direct infiltration via appropriately sized SuDS features including infiltration trenches or for larger areas infiltration basins would be considered.

5.5.14 If infiltration is proven to not be feasible following site-specific infiltration testing to BRE Digest 365, the drainage hierarchy would be followed and a suitable outfall to watercourse identified. If no watercourse is available, a suitable discharge to sewer would be pursued. Any attenuation features will need to be designed to accommodate the runoff from a 1 in 100-year plus climate change event and, where an outfall to watercourse is considered appropriate, be attenuated to greenfield discharge rates for an ordinary watercourse or 1.4 l/s/ha for an IDB watercourse (set to a minimum of 1.0 l/s). Climate change allowances for peak rainfall for both catchments within the Order Limits are provided in Table 4-1.

5.5.15 ~~Consideration will also be given~~ A risk assessment and options appraisal will be undertaken at detailed design to ~~the need for~~establish whether additional water quality monitoring at outfalls from the ~~BESS Compound. Any monitoring considered appropriate~~Substations, including the potential use of sensor-based systems, is required. The findings and any proposed monitoring measures will be ~~specified at detailed design stage as part of~~included in the detailed drainage strategy. Other pollution prevention measures such as oil and chemical spill kits will also be available on site..

5.5.16 Regarding foul water drainage, during the operational phase welfare facilities are to be limited to the substation compounds only. Given the remote nature of the Proposed Development and the fact that no readily accessible public sewers are understood to be available, wastewater generated by these welfare facilities will be managed by a sealed, non-mains drainage solution.

5.5.17 This will comprise either a sealed cesspool or a small package treatment plant, subject to site-specific constraints and environmental considerations. Where a cesspool is implemented, periodic off-site disposal will be undertaken by a licensed waste contractor in accordance with relevant regulatory requirements. Should a package treatment plant be adopted as the preferred option, any discharge of treated effluent to ground or surface waters shall be required to comply with the Environment Agency's General Binding Rules or else be subject to an environmental permit.

5.5.18 Wastewater treatment systems shall be sited and constructed to avoid adverse effects on water sources and resources and be designed in accordance with the Building Regulations Approved Document H. Appendix 15.1 Flood Risk Assessment (ES Volume 3) [EN0110012/APP/LVS/06.03.15.01] confirms that the substation locations are within Flood Zone 1 and 2 only and outside the flood extent associated with the 1 in 100-year plus climate change design event.

5.5.19 The detailed foul drainage strategy will confirm system selection, sizing and any discharge arrangements.

5.6 Access roads

5.6.1 Access to the Proposed Development will be required during construction and operational phases for maintenance. Access to the Proposed Development is proposed via existing access points from the local highway network wherever practicable with the addition of proposed private access roads being used in order to connect the Solar Development Sites with the current highway routes.

5.6.2 ~~New~~Permanent BESS and substation access tracks will have a maximum width of 6 m (8 m at passing points) and may be constructed of asphalt over a levelling layer of substrate. Parking bays are to be provided at substations and BESS area. The access tracks and parking bays are anticipated to be impermeable, with the final surfacing selection to be confirmed post-DCO at the detailed design stage. The proposed access tracks are as shown on the Works Plans [**EN0110012/APP/LVS/02.03**], with parking bays located within the maximum compound areas.

5.6.3 ~~New~~Permanent internal Solar PV access tracks will have a maximum width of 3.5 m (6 m at passing points) constructed of hardcore or gravel over a levelling layer of substrate. The access points from the public highway may comprise reinforced concrete. These access tracks will be permeable to allow water to filtrate through and maintain greenfield runoff rates as per the existing condition.

5.6.4 The choice of road and hardstanding surfaces will balance the benefits of permeability and infiltration with the need for flood resilience and long-term durability. In areas where high flows or overtopping are possible, more robust or reinforced surfaces may be required, while maintaining permeability where feasible.

5.6.5 Vehicular movements during operation and maintenance will be kept to only designated access tracks as far as practicable, to reduce the risk of soil compaction.

5.6.6 When more detail is available regarding track alignments in relation to the topography, further consideration would be given to the provision of a more formal drainage solution (i.e. the inclusion of swales, cross drains and basins to manage flows as close to source or at points of concentrated flow) if appropriate.

5.6.7 Wherever practicable, access will be from existing routes and existing field accesses will be utilised for construction access within the Order Limits. If a suitable field access point does not exist, for example due to poor highway visibility, new temporary construction accesses are anticipated to be constructed.

5.6.8 Where new access points are created, or existing access points amended, consideration will be given to any existing drainage infrastructure at those points to ensure drainage performance is maintained and to mitigate any potential flood risk impacts.

5.6.9 Surface water runoff from new temporary construction access roads, including the temporary haul road within the Cable Route Corridor described in ES Appendix 2.1: Cable Route Method Statement, will be managed through the use

of appropriate drainage and pollution prevention measures. These measures will be in accordance with the principles set out in this section and Section 5.7, and be informed by local ground conditions and topography.

5.7 Temporary works and construction

5.7.1 Several construction compounds will be temporarily located within the Order Limits for the construction of the Solar Development Sites and the Cable Route Corridors. The construction phase is proposed to take place over 24 to 36 months. The locations of the Cable Construction Compounds and Solar Development Site Construction Compounds are shown on the Works Plans [**EN0110012/APP/LVS/02.03**]. The Construction Compounds are assessed in the various site-specific Annexes of the FRA (ES Volume 3) [**EN0110012/APP/LVS/06.03.15.01**], including the Cable Construction Compounds which are also listed in Annex H, alongside a high-level assessment of flood risk at each compound.

5.7.2 The depth of cable trenches will be up to 2.0 m depending on the ground conditions. In some locations, trenchless techniques would be used. This includes for rail crossings, some road crossings, and crossings of Main River and IDB watercourses.

5.7.3 Among the trenchless installation methods available, Horizontal Directional Drilling (HDD) is considered to represent the worst-case scenario in terms of construction impact. This is due to the substantial area required for its operation and the extensive equipment necessary to support the works. The typical working area for HDD comprises an approximate 25 m x 25 m launch and receptor pit.

5.7.4 In particularly sensitive areas, such as Burr Closes Selby Site of Special Scientific Interest (SSSI), non-intrusive underground installation methods such as HDD will also be employed to avoid disturbing nearby watercourses and to mitigate potential direct impacts within the designated SSSI site.

5.7.5 An outline Construction Environmental Management Plan (oCEMP) [**EN0110012/APP/LVS/07.02**] has been prepared and includes measures such as those detailed below.

5.7.6 Ground investigation will be carried out and used to inform the detailed design of the construction compounds. This is to ensure that appropriate drainage design and aquifer protection measures are incorporated into the construction design, tailored to the specific geological / groundwater conditions at each compound location, to protect the water environment.

5.7.7 A non-permeable ‘Durabase Mat System’ or a similar non-ground penetrating mat system is one example mitigation measure that can be used within the compound areas to protect groundwaters during construction, where there is a greater risk of contamination. This includes Cable Construction Compound 4, which is sited in an area with no superficial deposits. This or an equivalent system will be used to protect groundwater where required.

5.7.8 In any temporary works or construction phases, careful consideration must be given to managing surface water runoff to prevent any increase in flood risk or impacting water quality on site and in surrounding areas.

5.7.9 During construction, measures will be implemented to prevent adverse impacts on field drainage ditches, ensuring that existing agricultural drainage infrastructure is not obstructed, damaged, or compromised by excavation or vehicle movements associated with the Cable Route Corridor.

5.7.10 Where land use changes from agricultural use to solar PV, existing agricultural land drainage systems would no longer be required. Where there is the potential for interaction with existing land drains that are required to be retained, their locations would be identified through pre-construction surveys and measures implemented to avoid, protect and / or divert them where practicable. Any permanent removal of an existing land drain would only be undertaken where the detailed drainage design demonstrates that the drain is no longer required and that the proposed change would not adversely affect wider land drainage systems or surface-water management on third-party land. Any land drains temporarily disturbed or damaged during construction would be reinstated, diverted, or otherwise made good to their original condition upon completion of the works to ensure that existing surface water and land drainage arrangements are maintained post-construction.

5.7.11 At decommissioning, where land is to be returned to agricultural use, checks on land drainage will be carried out and previously identified land drains that were removed or permanently affected by the works would be reinstated or replaced with equivalent drainage provision, where required, unless otherwise agreed with the relevant landowner.

5.7.12 Construction activities within the floodplain, such as trenching for the Cable Route Corridor, must be carefully managed to avoid adverse impacts on flood storage and conveyance. A sequential approach will be adopted, ensuring that spoil from excavation is stored outside the functional floodplain and Flood Zone 3, thereby reducing the risk of obstruction to flood flows and minimising potential contamination of the water environment.

5.7.13 Additionally, concrete used during construction contains hexavalent chromium, a substance classified as a specific pollutant in relation to surface water. To minimise the risk of contamination, construction activities involving concrete should be avoided during periods of heavy precipitation and, where practicable, scheduled during drier months.

5.7.14 The Applicant has engaged with the EA regarding interfaces with EA-managed assets, including the River Ouse and the associated set-back flood defences located to the north of Wistow Lordship. All necessary permissions via the EA's Protective Provisions will be secured in advance of any works beneath these features.

5.7.15 The cables will be installed using trenchless construction techniques to minimise disturbance in these locations, and both pre- and post-construction condition

surveys will be undertaken to ensure the integrity of the flood defence infrastructure is maintained.

5.7.16 An assessment of interactions between the proposed Cable Route Corridor and flood defence assets is included in Annex H of the FRA (ES Volume 3) [**EN0110012/APP/LVS/06.03.15.01**].

5.7.17 Temporary drainage measures must also be provided as described in the above sections to ensure that surface water is adequately controlled, with flow rates mimicking greenfield conditions.

5.7.18 It is important that consideration is given to runoff from construction areas to prevent overland flow entering any watercourses. Construction areas will be designed to prevent overland flow entering watercourses and the accumulation of standing water, to reduce the potential for pollutants to enter the water environment. Spill kits will be available to ensure any spills of oils, fuels or hazardous materials are promptly contained and cleaned to prevent contamination of surface and ground waters.

5.7.19 Furthermore, bunding, settlement lagoons, sediment traps and grass filter strips would be implemented in areas where there is a risk of silt entering watercourses. To mitigate compaction and rutting of surfaces, it is advisable to use low ground pressure tyres on vehicles and to manage deliveries in a manner that minimizes repeat journeys whenever feasible.

5.7.20 During construction of substations and the BESS compound, temporary drainage and pollution control measures will be implemented to manage runoff from these areas prior to the permanent drainage system becoming operational. Where practical, elements of the permanent drainage system will be constructed at an early stage of the works to reduce the duration over which temporary measures are required.

5.7.21 In addition, the requirement for, and extent of, any enhanced pollution control measures will be determined at detailed design stage and secured through the detailed CEMP, taking into account the higher pollution risk associated with the intended end use of these areas. This will include consideration of measures consistent with those identified within this Outline Drainage Strategy for substations and BESS, such as the management and containment of fuels, oils and chemicals, and, where relevant, firewater runoff.

5.7.22 Temporary measures will be maintained and adapted as necessary until the permanent drainage system is in place and operational.

5.7.23 The total construction phase is proposed to take place over 24 - 36 months, with shorter construction durations applicable to individual Solar Development Sites. Construction drainage will be designed to an appropriate flood event with an allowance for climate change and freeboard and agreed with the LLFA as part of approval of the CEMP.

5.7.24 It is anticipated that the construction site will be equipped with appropriate welfare facilities and all foul water generated would be appropriately collected in sealed

storage tanks and regularly emptied and disposed of by a licensed waste contractor in accordance with regulatory requirements.

5.7.25 Implementation of the above measures will ensure that the environmental impact on the surrounding area is minimised during the construction phase.

5.8 Drainage Maintenance

5.8.1 A detailed SuDS Maintenance Plan will be provided as part of the detailed Drainage Strategy submitted for approval post-DCO consent. This will cover the various SuDS elements that are ultimately proposed (e.g. infiltration basins, swales, etc.) alongside the recommended inspection and maintenance requirements and responsibilities.

5.8.2 Below and above-ground drainage features will be inspected at regular intervals to ensure they operate as intended and to check for blockages and damage which could adversely affect flood risk downstream.

5.8.3 Typical maintenance of surface SuDS features includes the removal of litter, branches, foliage, silts and other natural materials, which can reduce the hydraulic performance or storage capacity. Given the rural setting, planting regimes would be considered to minimise the need for extensive maintenance within drainage features, however, trimming of grass or planting and the removal or cutting-back of vegetation may be required, and will be included within the maintenance plan as appropriate.

5.8.4 Below ground drainage features (i.e. pipes and manholes) will be designed to achieve self-cleansing velocities. Measures to prevent silt and debris entering the drainage system during construction will be implemented as outlined in Section 5.7 and through the oCEMP [**EN0110012/APP/LVS/07.02**]; however, some residual material may still accumulate after the system is installed. A post-construction CCTV survey will be carried out to confirm the condition of any below ground drainage features and to identify and remove any debris. Ongoing maintenance and inspection of drainage systems shall be incorporated into the maintenance plan.

5.8.5 Headwalls and other interfaces between below-ground and above-ground drainage shall be routinely inspected to ensure they remain free-flowing and do not become blocked. Where screens are installed, these shall also be regularly inspected and cleared of any accumulated material.

5.8.6 The maintenance of drainage features will be largely in accordance with the requirements of the SuDS Manual (CIRIA 753). Any interfaces and subsequent maintenance requirements with IDB maintained watercourses will be discussed and agreed with the relevant IDB during subsequent design stages pursuant to the Protective Provisions in the draft DCO.

5.9 Decommissioning

5.9.1 In addition to the recommendations outlined in the temporary works and construction section, it is imperative to consider the safe decommissioning of all

drainage features. Decommissioning activities would be meticulously planned and executed to ensure compliance with environmental regulations and operational requirements in effect at the time of decommissioning.

5.9.2 An outline Decommissioning Environmental Management Plan (oDEMP) [**EN0110012/APP/LVS/07.04**] has been prepared, pursuant to DCO Requirement and includes measures such as:

1) Surface water systems would be decommissioned with due regard to water quality management and the prevention of uncontrolled runoff. The decommissioning process would typically involve dewatering, disconnecting, and sealing any drainage outfalls to prevent uncontrolled discharges; removing silt or debris from any drainage features including SuDS; and ensuring no residual contaminants remain that could pose a risk to surface or ground waters.
2) Infiltration systems or storage tanks would be emptied and inspected to ensure they do not pose any residual flood or pollution risks. Components may need to be completely removed, with surrounding areas reinstated or landscaped appropriately for the planned end use.
3) For foul water drainage systems, any remaining effluent within drainage features such as tanks, pumps, or septic systems would be safely removed by licensed contractors in accordance with regulatory guidelines. Manholes, inspection chambers, and pipework would be inspected, suitably capped off, and removed. If any elements are to be abandoned and retained in situ, they must be sealed to prevent the ingress of debris or surface water.
4) All decommissioning activities would adhere to an appropriate specification developed in accordance with industry standard documents, such as the Civil Engineering Specification for the Water Industry (CESWI), 8th Edition, current at the time of writing (Ref 13).

6 Conclusions

6.1.1 This outline Drainage Strategy identifies how the Proposed Development will manage surface water safely, sustainably, and in accordance with national and local policy requirements, ensuring that runoff is controlled, infiltration opportunities are maximised where feasible, and that the development does not increase flood risk elsewhere. The strategy has reviewed the current sources of information and data available at the time of the assessment, and has been informed by known site constraints, anticipated ground conditions, watercourse locations, and environmental considerations.

6.1.2 The final drainage design will be confirmed post-DCO at the detailed design stage and will be developed in accordance with the drainage principles, design parameters, and commitments set out within this strategy and in the Design Parameters and Commitments Document [**EN0110012/APP/LVS/05.06**]. The detailed drainage strategy will confirm the construction details and sequencing necessary to maintain the integrity of the drainage and firewater containment systems, including any local detailing around foundations, chambers, ducts or other infrastructure.

6.1.3 The Proposed Development has evolved through an iterative design process. The Proposed Design, as reflected on the Works Plans [**EN0110012/APP/LVS/02.03**], has responded to the results of site-specific hydraulic modelling. The layout of the Proposed Development will continue to be refined further post-DCO consent within the limits of deviation and the commitments made in the Design Parameters and Commitments Document [**EN0110012/APP/LVS/05.06**]. The Applicant has and continues to engage with key stakeholders on issues related to flood risk and drainage.

6.1.4 The proposed drainage solutions have been tailored to the characteristics and operational needs of each component of the Proposed Development. The Solar PV areas will largely retain a greenfield drainage response, with surface water dispersed across permeable, well-vegetated ground that promotes infiltration and avoids concentration of flows. For infrastructure with impermeable surfacing or where a higher pollution risk is present, such as the BESS, substations, and transformers, the strategy incorporates appropriate containment, treatment and discharge controls, including oil-water separation and dedicated firewater retention systems. These measures ensure both pollution prevention and compliance with relevant environmental requirements under normal operational and emergency conditions.

6.1.5 The Proposed Development will consider opportunities for the collection of surface water for non-potable uses where practical. Roof areas are largely limited to substations; however, these areas could provide a source of clean rainwater suitable for harvesting. The use of rainwater harvesting systems serving clean roof areas could support non-potable water demand and contribute to source control principles by reducing runoff volumes.

6.1.6 Infiltration will be pursued as the primary means of disposal for uncontaminated surface water. At detailed design stage, site-specific infiltration testing will be carried out in accordance with BRE Digest 365, supported by the requirements of the NYC Supplementary Infiltration Guidance, which highlights the importance of inviting the LLFA to witness the tests and providing comprehensive reporting of the results.

6.1.7 Should infiltration be demonstrated to be unfeasible following testing to BRE 365, the drainage hierarchy will be followed and a suitable outfall to a watercourse will be identified as the next preferred option. Surface water runoff rates for discharge to watercourse are to be restricted to 1.4 l/s/ha or a minimum of 1 l/s. If no viable watercourse connection exists, then discharge to the public sewer network will be considered. Any proposed discharges to IDB area watercourses or Yorkshire Water sewers will be discussed and agreed with relevant stakeholders during subsequent design stages pursuant to the provisions of the draft DCO.

6.1.8 Attenuation features will be designed to collectively accommodate runoff for events up to and including the 1 in 100-year plus climate change event. Indicative attenuation volumes have been calculated conservatively using the maximum anticipated compound areas described in Table 2-1 within Chapter 2: The Proposed Development (ES Volume 1) [**EN0110012/APP/LVS/06.01.02**] for a variety of outfall scenarios and to determine the potential spatial requirements.

6.1.9 The BESS drainage strategy includes provision of firewater containment to prevent any potentially contaminated runoff entering the water environment in the event of an incident. This will be achieved through the provision of segregated internal drainage systems for BESS enclosures and a secondary containment system on the external surface water network in the form of lagoons or tanks with automated shut-off valves linked to the fire alarm. A manual back-up shut-off valve system allowing for redundancy will also be integrated.

6.1.10 An appropriate containment volume will be agreed with NYFRS during subsequent design stages. In the event of an incident, retained water will be tested and disposed of off-site by a licensed waste contractor if contamination is found to be present.

6.1.11 The strategy also sets out clear provisions for temporary works and construction-stage drainage. Construction phase mitigation, including sediment control, field drain protection and careful management around sensitive receptors will be implemented as outlined in Section 5.7 and through the oCEMP [**EN0110012/APP/LVS/07.02**]. Construction drainage will be designed to an appropriate flood event with an allowance for climate change and freeboard and agreed with the LLFA as part of approval of the CEMP.

6.1.12 The maintenance of drainage features will be largely in accordance with the requirements of the SuDS Manual (CIRIA 753). Any interfaces and subsequent maintenance requirements with IDB maintained watercourses will be discussed and agreed with the relevant IDB during subsequent design stages pursuant to the Protective Provisions in the draft DCO. In addition, interactions between proposed CRC 1-4 and existing EA flood defences along the River Ouse and

Selby Dam and proposed temporary and permanent watercourse crossings, including the approach to Land Drainage consenting, is discussed within the FRA (ES Volume 3) [**EN0110012/APP/LVS/06.03.15.01**].

6.1.13 A detailed SuDS maintenance plan will be prepared and agreed with the ultimate asset owner as part of the detailed Drainage Strategy to define inspection regimes and responsibilities for long-term asset management.

References

Ref 1 Development and flood risk - guidance for the construction industry (C624) (2024) Ciria.org. Available at: [redacted] (Accessed January 2026)

Ref 2 GOV.UK (2025) Flood Risk and Coastal Change, GOV.UK. Available at: https://www.gov.uk/guidance/flood-risk-and-coastal-change. (Accessed January 2026)

Ref 3 Environment Agency (2016) Flood risk assessments: climate change allowances, GOV.UK. Available at: https://www.gov.uk/guidance/flood-risk-assessments-climate-change-allowances. (Accessed January 2026)

Ref 4 Department for Environment, Food & Rural Affairs (2014) Flood risk assessments if you're applying for planning permission, GOV.UK. Available at: https://www.gov.uk/guidance/flood-risk-assessment-for-planning-applications. (Accessed January 2026)

Ref 5 Department for Environment, Food & Rural Affairs (2015) Review individual flood risk assessments: standing advice for local planning authorities, GOV.UK. Available at: https://www.gov.uk/guidance/flood-risk-assessment-local-planning-authorities. (Accessed January 2026)

Ref 6 The SuDS Manual (C753) (2015) Ciria.org. Available at: [redacted] (Accessed January 2026)

Ref 7 Minerals and Waste Joint Plan Sustainability Appraisal Strategic Flood Risk Assessment Volume I -Data Review Document Volume II -Sequential Test Results (2016). Available at: https://www.northyorks.gov.uk/sites/default/files/fileroot/planning_migrated/minerals_and_waste_plan/Strategic_flood_risk_assessment%20-%20accessible.pdf (Accessed January 2026)

Ref 8 Council, N.Y. (2023) Selby Local Plan, North Yorkshire Council. Available at: https://www.northyorks.gov.uk/planning-and-conservation/planning-policy/planning-policy-your-local-area/selby-planning-policy/selby-local-plan (Accessed January 2026)

Ref 9 North Yorkshire County Council (2022) North Yorkshire Local Flood Risk Management Strategy Available at: https://edemocracy.northyorks.gov.uk/documents/s13040/North%20Yorkshire%20Local%20Flood%20Risk%20Management%20Strategy%20full%20report.pdf (Accessed January 2026)

Ref 10 Council, N.Y. (2023). Sustainable drainage systems guidance - 2022 update. [online] North Yorkshire Council. Available at: https://www.northyorks.gov.uk/environment-and-neighbourhoods/flooding/flood-

and-water-management/sustainable-drainage-systems-guidance-2022-update (Accessed January 2026)

Ref 11 The Building Regulations 2010 (2010) Drainage and waste disposal, GOV.UK. Available at: https://www.gov.uk/government/publications/drainage-and-waste-disposal-approved-document-h (Accessed January 2026)

Ref 12 The Control of Pollution (Oil Storage) (England) Regulations 2001, GOV.UK. Available at: https://www.legislation.gov.uk/uksi/2001/2954/contents (Accessed January 2026)

Ref 13 Civil Engineering Specification for the Water Industry (CESWI), 8th Edition, Water Industry Training Ltd, publish date 14th November 2023.

Ref 14 Department for Environment, Food & Rural Affairs (2025) National standards for sustainable drainage systems (SuDS), GOV.UK. Available at: https://www.gov.uk/government/publications/national-standards-for-sustainable-drainage-systems/national-standards-for-sustainable-drainage-systems-suds. (Accessed January 2026)

Ref 15 Presented to the Houses of Parliament pursuant to section 9(8) of the Planning Act 2008. (2025). Available at: https://assets.publishing.service.gov.uk/media/6915ba42bc34c86ce4e6e726/overarching-national-policy-statement-for-energy-en-1-web-accessible.pdf (Accessed January 2026)

Ref 16 Presented to the Houses of Parliament pursuant to section 9(8) of the Planning Act 2008. (2025). Available at: https://assets.publishing.service.gov.uk/media/6915b78bbc34c86ce4e6e71f/national-policy-statement-for-renewable-energy-infrastructure-en-3-web-accessible.pdf (Accessed January 2026)

Ref 17 Presented to the Houses of Parliament pursuant to section 9(8) of the Planning Act 2008. (2025). Available at: https://assets.publishing.service.gov.uk/media/6915b9049d50fc2fe8161744/national-policy-statement-for-electricity-networks-infrastructure-en-5-web-accessible.pdf (Accessed January 2026)

Ref 18 Environment Agency (2016) Flood risk assessments: climate change allowances, GOV.UK. Available at: https://www.gov.uk/guidance/flood-risk-assessments-climate-change-allowances. (Accessed January 2026)

Ref 19 National Grid Electricity Distribution (2024) 132 kV Connections Guidance Document. Available at: [redacted]. (Accessed January 2026)

Ref 20 L Cook R MCCuen 'Hydrologic response of solar farms' – Journal of Hydrologic Engineering (May 2013). Available at: https://www.north-herts.gov.uk/sites/default/files/2023-07/CD89%20Hydrologic%20Response%20of%20Solar%20Farms.pdf (Accessed January 2026)

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