East Pye Solar

Outline Operational Environmental Management Plan

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Schedule of Changes

Reference	Page	Description of Changes	Reason for Revision
Outline Operational Environmental Management Plan Revision 2	21	Extended commitment to include Scheme elements beyond the National Grid Substation.	In response to Relevant Representation NCC-124 and EA-016.
	21, 54	Clarification that the minimum buffer is 10m from the top of bank.	In response to Relevant Representation EA-012.
	28	Addition of sound levels for PRoW.	In response to Relevant Representation SNC-138.
	27, 28, 55, 56	Amendments to commitments regarding sound levels.	As a result of the Evening Noise Assessment [EXAM/9.21].
	41, 61, 62	Included additional mitigation for cumulative effects for waste and minerals	For consistency with ES: Chapter 18 – Other Environmental Matters [APP/6.1.18]
	Appendix A Preliminary Surface Water Drainage Maintenance Schedule	Amendments for Access for Maintenance and aggregate drainage system for BESS.	In response to engagement with LLFA.
Outline Operational Environmental Management Plan Revision 3	23	Additional detail provided on the BESS drainage system.	In response to WR-EA-024.

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Appendices

Appendix A Preliminary Surface Water Drainage Maintenance Schedule

1 Introduction

1.1 Background

1.1.1 This document provides the outline for the Operational Environmental Management Plan (OEMP) for East Pye Solar (hereafter referred to as 'the Scheme').

1.1.2 A Development Consent Order (DCO) would provide the necessary authorisations and consents for the Scheme. The Scheme comprises the construction, operation and maintenance, and decommissioning of a Solar photovoltaic (PV) electricity generating station with a total capacity exceeding 100 megawatts (MW), and associated development including a Battery Energy Storage System (BESS), up to three 132kV Project Substations and up to three 400kV Project Substations, Grid Connection Infrastructure and a new National Grid Substation. A description of the Scheme can be found in **Environmental Statement (ES) Volume 1, Chapter 4 – The Scheme [EN0110014/APP/6.1.4]**.

1.1.3 The Order Limits contain all elements of the Scheme comprising the Solar PV Arrays, 132kV and 400kV Project Substations, the National Grid Substation, the BESS, Grid Connection Infrastructure, interconnecting cables within the Cable Route Corridor (CRC), Mitigation and Enhancement Areas and Highway Works. A description of the Order Limits is provided in the **ES Volume 1, Chapter 3 – The Order Limits [EN0110014/APP/6.1.3]**.

1.1.4 Due to its total capacity exceeding 100 MW the Scheme is classified as a Nationally Significant Infrastructure Project (NSIP) under Sections 14(1)(a) and 15(2) of the Planning Act 2008 (Ref 1-1) and therefore requires consent via a DCO. The decision whether to grant a DCO will be made by the Secretary of State for Energy Security and Net Zero (hereafter referred to as 'the Secretary of State') following the Examination and Recommendation by the Planning Inspectorate.

1.1.5 An Environmental Impact Assessment (EIA) has been undertaken for the Scheme and an **Environmental Statement (ES) [EN0110014/APP/6.1 to 6.4]** has been prepared in accordance with the Infrastructure Planning (EIA) Regulations 2017 (EIA Regulations) (Ref 1-2). In accordance with the requirements of the EIA Regulations, the ES contains the assessment of the likely significant effects on the environment that may be caused during the operation of the Scheme and describes proposed mitigation measures.

1.1.6 The aim of the Outline OEMP is to demonstrate how the mitigation measures relevant to operational activities included in the ES will be implemented. It also sets out the monitoring and auditing activities designed to ensure that such mitigation measures are carried out and effective. This document does not address construction or decommissioning activities, which are subject to separate Environmental Management Plans and procedures set out in the

Outline Construction Environmental Management Plan (Outline CEMP) [EN0110014/APP/7.1] and **Outline Decommissioning Environmental Management Plan (Outline DEMP) [EN0110014/APP/7.3]**).

1.1.7 This Outline OEMP is designed with the objective of securing the relevant environmental mitigation measures set out within the ES. This document provides the likely structure of, and some outline information relevant to, the detailed OEMP. The detailed OEMP will be produced substantially in accordance with this Outline OEMP following the grant of the DCO before the Scheme becomes operational. It will then be submitted to the relevant Local Planning Authority (LPA) for approval, in accordance with Requirements of the **draft DCO [EN0110014/APP/3.1].**

1.1.8 The key elements of this Outline OEMP include:

- An overview of the Scheme, operational activities and programme;
- Prior assessment of environmental impacts (through the EIA process);
- Proposed design and other mitigation measures to prevent or reduce potential adverse environment effects;
- Monitoring and reporting of effectiveness of mitigation measures;
- Corrective action procedure; and
- Links to other complementary plans and procedures.

1.1.9 In summary, the Outline OEMP will identify how commitments made in the EIA will be translated into actions during operation and includes a process for implementing the actions through allocation of key roles and responsibilities. Any additional licences, permits or approvals that are required will be listed in the detailed OEMP, including any environmental information submitted in respect of them. The detailed OEMP will be a live document updated throughout the operational phase as required, for example to reflect changes in legislation or contact details. This Outline OEMP has been designed with the objective of compliance with the relevant environmental legislation and mitigation measures set out within the ES.

1.1.10 It is noted that multiple detailed OEMPs may be prepared, approved, and implemented for specific works, for example separate OEMPs may be prepared for the Sites. Within this document ‘detailed OEMP’ is defined to collectively refer to all detailed OEMPs which may be prepared.

1.1.11 The appointed Operator(s) will be responsible for working in accordance with the environmental controls documented in the detailed OEMP which will be prepared substantially in accordance with this Outline OEMP, as a requirement of the **draft DCO [EN0110014/APP/3.1]**.

1.2 The Applicant

1.2.1 The Scheme is being developed by East Pye Solar Limited ('the Applicant'). East Pye Solar Limited is a 100% subsidiary of Island Green Power UK Projects Limited, which is in turn a 100% subsidiary of Island Green Power's UK group holding company, Island Green Power Group Limited (IGP). The Applicant is part of IGP, who are a leading international developer of renewable energy projects, established in 2013.

1.2.2 IGP has successfully delivered nearly 40 solar projects worldwide that have generated more than 3 GW of energy capacity. This includes 21 solar projects in the UK. These range in size from below 5 MW to Nationally Significant Infrastructure Projects (NSIPs) such as Cottam, currently the UK's largest consented solar project. Cottam will generate 600 MW of clean, renewable and secure electricity and includes 600 MW of Battery Storage that will store then release energy as needed.

1.2.3 IGP's mission is to deliver renewable energy solutions that create lasting value for the communities they serve, protecting the environment while fostering economic growth and energy independence.

1.3 The Scheme

1.3.1 The Scheme comprises the construction, operation and maintenance, and decommissioning of a Solar photovoltaic (PV) electricity generating station with a total capacity exceeding 100MW and associated development including a Battery Energy Storage System (BESS), up to three 132kV Project Substations and up to three 400kV Project Substations, Grid Connection Infrastructure and a new National Grid Substation. A description of the Scheme can be found in **Environmental Statement (ES) Volume 1, Chapter 4 – The Scheme [EN0110014/APP/6.1.4]**.

1.3.2 The Order Limits contain all elements of the Scheme comprising the Solar PV Arrays, 132kV and 400kV Project Substations, the National Grid Substation, the BESS, Grid Connection Infrastructure, interconnecting cables within the Cable Route Corridor (CRC), Mitigation and Enhancement Areas and Highway Works. A description of the Order Limits is provided in the **ES Volume 1, Chapter 3 – The Order Limits [EN0110014/APP/6.1.3]**.

1.3.3 Highway Works (refer to the **Works Plan [EN0110014/APP/2.3]**) are sections of the highway network that will contain localised improvements, such as improvements to deteriorated road edges or temporary highway and traffic works required to safely accommodate the Abnormal Indivisible Load (AIL) deliveries to the Scheme. Highway Works will support the movement of construction vehicles on narrower sections of the local road network (LRN) within parts of the routes to and within the Order Limits (refer to **ES Volume 1, Chapter 11 - Transport and Access [EN0110014/APP/6.1.11]**).

1.3.4 The **Design Principles, Parameters and Commitments [EN0110014/APP/7.18]** set out the maximum parameters and commitments of the Scheme.

2 Operational Environmental Management

2.1 Introduction

2.1.1 This section sets out the general site arrangements for the operation and maintenance phase of the Scheme.

2.2 Operational Programme

2.2.1 Subject to being granted development consent, the earliest construction start date is assumed to be 2028. The operation and maintenance phase is assumed to commence in 2031. The operational life of the Scheme will be no more than 60 years and decommissioning is therefore assumed to be in 2091.

2.3 Operational Activities

2.3.1 During operation, activity on the Sites would be restricted principally to vegetation management, equipment maintenance and servicing, ad hoc replacement of any components that fail or reach the end of their lifespan, periodic fence inspection, and monitoring to ensure the continued effective operation of the Scheme. Operational replacement of Solar PV Panels and BESS is discussed in **Section 2.12**.

2.3.2 Along the Cable Route Corridor, operational activity will consist of routine inspections (schedule to be determined) and any reactive maintenance such as where a cable has been damaged.

2.3.3 The new National Grid Substation will be managed and maintained by National Grid. The Project Substations will be managed and maintained by the Applicant / Operator of the site.

2.3.4 As stated in **ES: Chapter 11 - Transport and Access [EN0110014/APP/6.1.11]**, during the Scheme's Operational Phase, there are anticipated to be up to five visits to each of the Sites per month for maintenance purposes. These would typically be made by light van or 4 x 4 type vehicles. The installed grid connection cables (within the Cable Route Corridor) will be located underground. Access may be required for maintenance, but this is only likely once or twice a year.

2.3.5 Welfare facilities will be required at the substations within each location. Any wastewater will be removed via tanker to local licensed wastewater treatment works.

2.4 Operational Staff

2.4.1 No permanent on-site staff will be required to operate the Scheme but there will be limited staff facilities located in the control rooms associated with the

400kV and 132kV Project Substations. Some permanent equipment for monitoring the Sites will be located in the Relay and Control Room. Whilst this would typically be accessed remotely, it would be available for occasional physical access during routine visits. Further staff jobs would be created, which would not be based on site.

2.4.2 No on-site staff will be required to operate the National Grid Substation but there will be limited staff facilities.

2.5 Working Hours

2.5.1 The Sites will generally be unmanned during normal operation. Routine maintenance would be carried out as required Monday to Friday 07.00 – 18.00. Emergency maintenance would be carried out as and when needed.

2.6 Parking Provisions

2.6.1 During operation, parking, in the form of permeable gravel hardstanding will be provided within the operational compounds, including the National Grid Substation, Project Substations and BESS.

2.7 Control of Light

2.7.1 Lighting is generally not required within the Sites during the Operational Phase of the Scheme, with all external lighting switched off. Lighting will only be activated during scheduled maintenance, in emergency situations or for security purposes. Lighting will be directed away from woodland / hedgerows.

2.7.2 All routine maintenance activities would be scheduled for daylight hours as far as is practicable, and therefore it is anticipated that focussed task specific lighting should only be required in the event of emergency works / equipment failure requiring night-time working or panel cleaning operations.

2.7.3 Motion sensing security lighting would be provided within Project Substations, the National Grid Substation and within the BESS Compound to be used to maintain safe working conditions in winter months, for security purposes, and for maintenance activities. These will be positioned and angled to focus on human or vehicular movement.

2.7.4 Lighting for the operational phase will be substantially in accordance with the principles for lighting as set out in **ES: Volume 3, Appendix 7.11 – Lighting Strategy [EN0110014/APP/6.3.7.11]**.

2.8 Operational Traffic and Access

2.8.1 During operation, other than during the operational replacement of Solar PV Panels (refer to **Section 2.12**), there will be a small number of daily vehicle

trips, with additional staff attending when required for maintenance and cleaning activities.

2.8.2 The measures set out in the **Outline Operational Traffic Management Plan [EN0110014/APP/7.7]** will be adhered to.

2.8.3 Wherever practicable, existing field accesses will be utilised for operational access to the Scheme; and wherever practicable, existing field accesses will be utilised between field parcels. Access to the Scheme is set out in **ES Volume 3, Appendix 11.1 - Transport Assessment [EN0110014/APP/6.3.11.1]**.

2.9 Panel Cleaning

2.9.1 Due to the wet UK climate, Solar PV Panels are largely self-cleaning and deterioration in PV system output due to dust or dirt is generally low. The requirement for, and the frequency of, cleaning of the Solar PV Panels due to the build-up of dust and dirt varies depending upon site specific conditions. For example, the presence of fine dust emitters such as quarries, agricultural operations (harvesting), and the volume and proximity of nearby woodland can all impact the level of dust deposition. However, the main factor influencing cleaning requirements in the UK is lichen growth which again is influenced by site specific and climatic factors.

2.9.2 As stated above, the deterioration in output due to dust or dirt is generally low and, therefore, the requirement for cleaning due to loss of output is balanced against cost of the cleaning operation. Some sites can operate without the need to be cleaned, whereas some sites require cleaning annually. The cleaning requirements for the Scheme can only be accurately determined once operational and, therefore, to present a worst case for the assessments presented in this ES, an annual cycle is assumed.

2.9.3 The Solar PV Panels would be cleaned using water only. Deionised water would be used as preference. No chemical cleaning products would be used, with stubborn dirt brushed or wiped off the panels.

2.10 Management of Vegetation Planting

2.10.1 An **Outline Landscape and Ecology Management Plan (LEMP) [EN0110014/APP/7.4]** has been prepared and submitted as part of the Application. It provides a framework for delivering the landscape strategy and the successful establishment and future management of proposed landscape works associated with the Scheme. It sets out the short and long-term measures and practices that will be implemented to establish, monitor and manage landscape and ecology mitigation and enhancement (including biodiversity net gain) measures embedded in the design.

2.10.2 A detailed LEMP will be prepared substantially in accordance with the **Outline LEMP [EN0110014/APP/7.4]** and will be submitted to and approved

by the relevant local planning authority or authorities prior to construction. This will include provisions in respect of on-going maintenance and management of the landscape and ecology.

2.11 Recovery, Recycling and Disposing of Waste

2.11.1 Solid waste materials generated during Scheme operation and maintenance phases would primarily be general (household type) waste from the staff visiting site. However, there would also be a limited volume of packaging waste associated with the delivery of spare components. In accordance with legislation and guidance applicable at the time, all general and packaging type waste would be segregated prior to transport to an approved, licensed third party landfill and recycling facilities.

2.11.2 Additionally, any waste components (e.g. faulty or damaged Solar PV Panels, batteries, cables, connectors and mounting structures) would also be removed and recycled as far as practical and in accordance with legislation and guidance applicable at the time (refer to **Section 2.12**).

2.12 Replacement Programme

2.12.1 This section summarises the anticipated design life and replacement frequency for the main elements of the Scheme (Solar PV Panels, BESS etc.), based on other similar solar Nationally Significant Infrastructure Project (NSIP) schemes. Waste is discussed further in **ES: Chapter 18 - Other Environmental Matters [EN0110014/APP/6.1.18]**.

2.12.2 During the anticipated 60-year operational life of the Scheme, it is expected that there will be a requirement for the periodic replacement of some of the electrical infrastructure. It is not expected that an extensive replacement of all components will be required across the entirety of the Scheme during one period. The programme for replacement of equipment across the Scheme is anticipated to be staged to maintain the electrical export to the National Grid Substation.

2.12.3 The following assumptions have been made for the programme of replacement activities:

- It is assumed that the operational life of Solar PV Panels is 40 years and that all Solar PV Panels will be replaced once during the operational phase and this will take a maximum period of 24 months. This is separate to the ad-hoc replacement of Solar PV Panels that may occasionally be required due to damage, for example;
- It is expected that the BESS could be replaced up to five times during the operational phase;
- Access to the Sites will be via the access routes defined for the construction phase. If any Abnormal Indivisible Loads (AILs) are required for replacement of equipment, consultation will be carried out and

approvals will be sought from the relevant local planning and highway authorities;

- Components such as Solar PV Mounting Structures, 132kV Project Substations, 400kV Project Substations, National Grid Substation and BESS Compound buildings are not anticipated to be replaced during the operational phase. No intrusive ground works are anticipated in the replacement of Solar PV Panels or BESS Containers; and

- Transformers are assumed to have a design life of 30 years and as such may require replacement once during the lifetime of the Scheme, however replacement will only be carried out if required for performance or health and safety reasons

2.12.4 The assessment in the ES has considered a reasonable worst-case scenario for operational replacement with regard to frequency and duration of replacement activities. Where a shorter or longer operational replacement programme is anticipated to result in a greater level of likely significant effects in respect of a particular EIA topic, the worst-case programme has been assumed for the purposes of the assessment of that topic in accordance with best practice for the respective topic areas.

2.12.5 Elements of the activities during the replacement programme would be similar to those carried out during construction. Where mitigation has been identified in the ES to mitigate construction effects and such mitigation is applicable to the replacement programme, these have been repeated in **Section 3** of this Outline OEMP.

2.13 Water Supply

2.13.1 During operation and maintenance, self-contained portable welfare units which store foul/wastewater for collection/emptying by specialist licenced contractors would be deployed on an ad hoc basis (e.g. if required by maintenance crews).

2.13.2 The water supply for operational staff facilities is assumed to be by tankers on to site by road; and stored on site. Welfare facilities will be required at the Project Substations and National Grid Substation. Any wastewater will be removed via tanker to local licenced wastewater treatment works.

2.13.3 The volume of stored fire water will be maintained to ensure there is sufficient water for firefighting purposes. More details on fire water supply and storage is provided within the **Outline Battery Storage Safety Management Plan (Outline BSMP) [EN0110014/APP/7.5].**

2.14 Surface Water Drainage

2.14.1 The detailed operational drainage design would be carried out preconstruction with the objective of ensuring that drainage of the land to the present level is maintained. It would follow either the design of a new

drainage system taking into account the proposed new infrastructure (access tracks, cable trenches and structure foundations) to be constructed or, if during the construction of any of the infrastructure there is any interruption to existing schemes of land drainage, new sections of drainage would be constructed.

2.14.2 The design of new drainage systems would be based on **ES Chapter 9 - Water Environment [EN0110014/APP/6.1.9]** and **ES: Appendix 9.1 Flood Risk Assessment and Outline Surface Water Drainage Strategy [EN0110014/APP/6.3.9.1]** and the commitments set out in **Design Principles, Parameters and Commitments [EN0110014/APP/7.18]**.

2.14.3 Management of fire water is further described in **ES: Chapter 9 - Water Environment [EN0110014/APP/6.1.9], ES: Appendix 9.1 Flood Risk Assessment and Outline Surface Water Drainage Strategy [EN0110014/APP/6.3.9.1]** and the **Outline BSMP [EN0110014/APP/7.5].**

2.15 Grazing

2.15.1 For the purposes of assessment and reporting of effects, as a reasonable worst case it is assumed that vegetation will be managed with machinery and there will be no grazing at the Sites during the operation and maintenance phase.

2.15.2 However, should consent be granted, grazing by sheep will be explored, noting that there are no known landowner restrictive covenants or other reasons that would prevent such use.

2.16 Security

2.16.1 The Sites will receive several security risk management threat assessments during the development, construction, operation, and ultimately decommissioning phases. These security risk management threat assessments are conducted by suitable qualified and experienced persons (SQEP) and will determine security risks.

2.16.2 The Applicant recognises, and embraces, the symbiotic relationship between safety and security. The security arrangements to be present at the Sites will therefore contribute to the overall safety of all who will, or may, enter the Site. The security arrangements will be SQEP (Suitably Qualified Experienced Personnel) reviewed at identified epochs commensurate to the Security Risk rating and will further assess any changes in the Security Risk Management Threat Assessment.

2.16.3 The boundary of the Sites will be secured both by fencing and by the provision of Closed-Circuit Television (CCTV) equipment in accordance with the **Design Principles, Parameters and Commitments [EN0110014/APP/7.18]**.

2.16.4 Other potential security measures to be included comprise:

- Detection systems such as beam break, image detection etc. to raise alarm when fence breached;
- Audio announcement when intruder detected to warn alarm triggered and police on way;
- Barriers / locked gates at main entrances to the Sites;
- Steel doors on substation buildings;
- Buried cables as far as practicable;
- Remote monitoring; and
- Alarm response contract with keyholder/security company.

3 Mitigation and Monitoring

3.1 Purpose

3.1.1 This section of the Outline OEMP sets out the mitigation and management measures pertaining to the Solar PV Array areas, BESS and Project Substations, to be included as a minimum in the detailed OEMP. It also identifies where monitoring is proposed to assess the effectiveness of the mitigation measures. This section will be updated and developed following consent as part of the preparation of the detailed OEMP.

3.1.2 The mitigation measures pertaining to the National Grid Substation and Grid Connection Infrastructure are set out separately in Section 4.

3.2 Climate Change

Table 3.1: Climate Change

Potential Impact	Mitigation/Enhancement Measure	Monitoring Requirements
Greenhouse gas emissions from the operational maintenance activities required during operation of Scheme. **Stronger winds, heatwaves, heavy precipitation and increased risk of fires/wildfires**	Where applicable, the construction embedded mitigation measures as outlined in the **Outline CEMP [EN0110014/APP/7.1]** will be put in place during the operational phase to optimise efficiency and will be outlined in the detailed OEMP, to be prepared substantially in accordance with this Outline OEMP. PV panels will be cleaned with deionised water and not chemical agents. • The Scheme will adhere to good practice and guidance. Gas-insulated switchgear equipment is to be supplied to minimise leakages. Additionally, regular checks of the equipment will be carried out for gas leaks. The following mitigation measures will also be employed at the site: • Using equipment's cooling systems where necessary/adapting working practices and equipment used based on weather conditions. • Monitoring weather conditions to ensure Solar PV Arrays are not cleaned during periods of hot weather which could cause thermal shock.	The overall responsibility will be with the Scheme operator. Specific responsibilities will be confirmed in the OEMP(s). Monitoring weather forecasts and the news for Environment Agency flood warnings, relevant weather warnings, and water levels of the local waterways. Refer to the **Outline BSMP [EN010168/APP/7.5]**

Potential Impact	Mitigation/Enhancement Measure	Monitoring Requirements
	• Protecting workers and resources from extreme weather conditions through appropriate PPE and working practices. • Monitoring weather forecasts and the news for Environment Agency flood warnings, relevant weather warnings, and water levels of the local waterways. • Regular planned maintenance of the Scheme will be conducted to optimise efficiency of the Scheme infrastructure. • Increasing recyclability by segregating waste to be re used and recycled where reasonably practicable. • Off-site reuse, recycling and recovery of materials and waste where reuse on site is not practicable. • Operating the Scheme in such a way as to minimise the creation of waste and maximise the use of alternative materials with lower embodied carbon such as locally sourced products and materials with a higher recycled content. • Encouraging the use of lower carbon modes of transport by identifying and communicating local bus connections and pedestrian and cycle access routes to/from the Scheme to all staff. • Off-site prefabrication will be undertaken where practicable, including use of prefabricated elements. • Switching off vehicles and plant when not in use and ensuring vehicles conform to current UK emissions standards. • Using equipment's cooling systems where necessary, i.e. for the BESS and for the standalone conversion units, and adapting	

Potential Impact	Mitigation/Enhancement Measure	Monitoring Requirements
	working practices and equipment used based on current weather conditions. • Protecting workers and resources from extreme weather conditions through appropriate PPE and working; and • BESS to include Heating, Ventilation and Cooling (HVAC) systems which would be contained within the individual equipment containers as well as other measures outlined in the **Outline BSMP [EN0110014/APP/7.5]**.	

3.3 Landscape and Visual

Table 3.2: Landscape and Visual

Potential Impact	Mitigation/Enhancement Measure	Monitoring Requirements
Loss of existing landscape features (e.g., vegetation). **Visibility of operational activities.**	The **Outline LEMP [EN0110014/APP/7.4]** sets out the measures proposed to mitigate the potential effects on landscape (and biodiversity) features, and to enhance the landscape and biodiversity value of the Order limits. A detailed LEMP will be prepared substantially in accordance with the principles of the **Outline LEMP [EN0110014/APP/7.4]** and will be submitted to and approved by the relevant planning authority. This will include measures to ensure landscape mitigation and enhancements are established and maintained into and throughout the operational phase. **General Offsets/ Buffers:** Offsets / buffers outlined in **ES: Chapter 7 Landscape and Visual [EN0110014/APP/6.1.7]** and secured through the **Design Principles, Parameters and Commitments [EN0110014/APP/7.18],** have been embedded into the design of the Scheme to protect the landscape fabric of the Sites. As well as standard offsets / buffers that have been applied across the Scheme, **Chapter 7: Landscape and Visual [EN0110014/APP/6.1.7]** identifies those areas which were avoided to reduce Landscape and Visual effects.	Specific measures will be confirmed in the detailed LEMP.

Potential Impact	Mitigation/Enhancement Measure	Monitoring Requirements
	Landscape Design Parameters: Embedded mitigation measures: Design Parameters are set out in **ES: Chapter 7 - Landscape and Visual [EN0110014/APP/6.1.7]** and secured through the **Works Plan [EN0110014/APP/2.3], draft DCO [EN0110014/APP/3.1]** and **Design Principles, Parameters and Commitments [EN0110014/APP/7.18].** **Lighting:** Motion sensing lighting will be used only for maintenance and security purposes. Lighting is not expected to be required for the remainder of the Scheme, with the exception of temporary lighting for maintenance. Lighting controls, lower colour temperatures and luminaire orientations set out in the Lighting Strategy **[EN0110014/APP/6.3.7.11]** will be considered as part of the detailed design to minimise and negate impacts as far as practicable. **Proposed Green Infrastructure** Proposed planting typologies are to be secured within the **Outline LEMP [EN0110014/APP/7.4].** The long-term management and maintenance of existing and new vegetation is an embedded mitigation measure which ensures vegetation would be actively managed in the long term. The	

Potential Impact	Mitigation/Enhancement Measure	Monitoring Requirements
	prescribed maintenance height of hedgerow at 3m is an embedded mitigation measure which aims to screen views towards taller elements of the Scheme from nearby PRoW. The active management and maintenance of trees and woodland within the Site, both newly planted and existing, aims to ensure they not only survive but reach maturity and establishment in the medium to long term durations. In turn, these landscape features are primary mechanisms for filtering and screening views towards the Scheme from nearby PRoW, roads and residential dwellings. Measures are to be secured within the **Outline LEMP [EN0110014/APP/7.4]**. **Arboricultural Protection:** The Scheme has been designed, as far as practicable, to avoid and reduce the effects on arboriculture resource by embedding mitigation measures into the design process as secured in the **Design Principles, Parameters and Commitments [EN0110014/APP/7.18].**	
Soil compaction or damage to stem/branches during replacement activities.	Perimeter fencing will be installed and remain in situ during operation of the Sites. This will suitably protect trees on the field boundaries of the Sites from operational impacts such as maintenance and replacement activities. New tree and woodland planting is not proposed within the open cut sections of Cable Route Corridor, ensuring that future tree removal will not be required to remedy possible tree root interference with the cables. No new tree planting is proposed within the veteran tree buffer zones of identified veteran trees to ensure no future shading and resulting decline in the health and longevity of veteran trees.	To be confirmed in the detailed **OEMP(s).** Refer to **Outline LEMP.**

Potential Impact	Mitigation/Enhancement Measure	Monitoring Requirements
	Replacement activities will be facilitated through use of access tracks installed during the construction of the Scheme, ensuring no additional root or canopy impacts to retained trees during replacement activities. Permanent access points and visibility splays for the Order Limits will be the same as those used for construction, ensuring no additional tree removal or pruning during operation of the Sites. All maintenance and replacement activities near veteran trees will be supervised by an Arboricultural Clerk of Works (ACoW) to ensure no machinery or materials enter the Veteran tree buffer zone. This may be achieved through implementation of ground protection and/or tree protection fencing around the veteran tree buffer zones during maintenance and replacement activities.	

3.4 Ecology and Biodiversity

Table 3.3: Ecology and Biodiversity

Potential Impact	Mitigation/Enhancement Measure	Monitoring Requirements
Impacts on biodiversity features during the operation of the Scheme	The **Outline LEMP [EN0110014/APP/7.4]** contains habitat management measures to take place within the Sites which will provide net gains for biodiversity. Prescriptions include substantial new hedgerow and tree planting, reinforcement planting at existing hedgerows and field boundaries, extensive grassland habitat creation and sympathetic management both within buffers and within the arrays, as well as discrete, valuable habitat creation in appropriate locations. A suitably qualified and experienced Ecological Clerk of Works (EcoCoW) will be appointed prior to the commencement of panel replacement activities or other non-standard operational maintenance and through whom appropriate ecological advice will be provided throughout. The EcoCoW will be responsible for undertaking and/or co-ordinating checks for protected species, providing watching briefs and providing confirmation that activities can commence in adherence with relevant legislation at that time. **Habitats and birds:** During operation, habitat management and maintenance works will be timed, where appropriate, to avoid ecologically sensitive periods, for example hedgerow maintenance will avoid nesting bird season. Details of this are prescribed within the **Outline LEMP [EN0110014/APP/7.4].**	Refer to the **Outline LEMP**.

Potential Impact	Mitigation/Enhancement Measure	Monitoring Requirements
	With the exception of land that has been excluded from development, the perimeter of the Order Limits will be fenced for security purposes. **Bats:** Permanent lighting is not required within the Order Limits for the Operational Phase. Motion sensing security lighting will be provided within the Project Substations and within the BESS compound, to be used only for maintenance and security purposes. A sensitive lighting strategy as part of the detailed OEMP will specify how this artificial lighting will be installed and used, which will serve to mitigate adverse impacts on ecological receptors which are adversely impacted by lighting, such as bats. The Scheme will strengthen existing key movement corridors through the planting up of gaps along existing hedgerows and tree lines, as well as through the creation of new hedgerow and tree lines to improve connectivity throughout the Scheme. The creation of diverse habitats including new grassland habitats which will improve potential foraging opportunities. **Badger:** Where appropriate, Badger fencing will incorporate specific design measures such as gaps, gates or other features, (particularly associated with existing vegetated corridors and key commuting routes) in order to ensure continued permeability and access to foraging areas across the Site for Badger.	

Potential Impact	Mitigation/Enhancement Measure	Monitoring Requirements
	Should new badger setts be excavated in areas where they come into conflict with ongoing management activities, then these setts would likely be excluded under a mitigation licence from Natural England. The mitigation licence would secure any compensation measures (such as the creation of artificial setts) required, the exclusion of the setts, and would ensure any impacts to setts are compliant with current legislation.	
Potential pollution from battery fire or replacement at the BESS.	The risk of a fire and measures to mitigate impacts in the event of a fire are detailed within the **Outline BSMP [EN0110014/APP/7.5].** A suitably qualified and experienced EcoCoW will be appointed prior to the commencement of battery replacement activities or non-standard operational management and through whom appropriate ecological advice will be provided throughout. The EcoCoW will be responsible for undertaking and/or co-ordinating checks for protected species, providing watching briefs and providing confirmation that activities can commence in adherence with relevant legislation at that time.	Specific measures will be confirmed in the detailed BSMP.

3.5 Water Environment

Table 3.4: Hydrology, Flood Risk and Drainage

Potential Impact	Mitigation/Enhancement Measure	Monitoring Requirements
Impacts on water quality in waterbodies that may receive surface water runoff or be at risk of chemical spillages from supporting infrastructure for the Scheme (e.g., Substations, BESS) and maintenance activities. **Potential for reduced chemical loading of watercourses associated with cessation of nitrate, pesticide, herbicide and insecticide applications on arable fields, or reduction in fine sediment/soil erosion, which would be beneficial.** **Hydro morphological impacts to waterbodies including changes to physical form (for example**	Mitigation that has been embedded into the Scheme by design includes: **Pollution Risk:** • All Solar PV Panels will be per-and polyfluoroalkyl substances (PFAS) free. The cables will have standard cross-linked polyethylene (XLPE) insulation.; • The BESS will have a surface water drainage system to capture firefighting water in the unlikely event of a fire incident water, which is underlain by an aggregate subbase lined with an impermeable membrane. An automated penstock (fitted with a self-actuating valve triggered by the detection of a fire with back-up manual option) will also be incorporated at the downstream end of the BESS drainage system; • The aggregate drainage system of the BESS may be split into 'compartments' for each zone of battery units, each with their own associated lined aggregate sub-base area that would be separated by lengths of access track. This would aid in the isolation and testing of surface water runoff, and remediation of affected areas in the event of a fire incident. If this approach is not taken, the drainage system would still fully contain contaminated runoff in the event of a reasonable worst-case fire event.	Regular recording of compliance in a logbook. The OEMP will detail the frequency.

Potential Impact	Mitigation/Enhancement Measure	Monitoring Requirements
where outfalls or watercourse crossings are required) which underpin habitats. **Impacts on flood risk from increased runoff from new impervious areas associated with the Project Substations, National Grid Substation and BESS.**	• Regular maintenance will be undertaken on plant and equipment to reduce the likelihood of pollution incident; • Oil drip trays (for maintenance/replacement activities) would be visually inspected and any polluting materials suctioned out and stored in a bunded tank, then once full, removed from the Order Limits for disposal; • Fuel and other potentially polluting chemicals will either be in self-bunded leak proof containers or stored in a secure impermeable and bunded area (minimum capacity of 110% of the capacity of the containers), If pollution is identified it will be suctioned to a self-bunded (or similar) tank and removed from site for suitable disposal; • Security measures are set out in the **Design Principles, Parameters and Commitments [EN0110014/APP/7.18].** The Sites are to be kept secure to prevent vandalism that could lead to a pollution incident;. • Solar PV Panel and BESS replacement is anticipated during the operational lifetime of the Scheme. This would be managed in a similar way to the construction and decommissioning phases through the implementation of measures included within a detailed CEMP and detailed DEMP. **Drainage and Surface Water Management:** • The solar PV arrays, BESS and Project Substation elements of the Scheme will be set back at least 10m from the top of bank of watercourses; • The BESS and Project Substation elements of the Scheme will have surface water drainage systems lined with an impermeable	

Potential Impact	Mitigation/Enhancement Measure	Monitoring Requirements
	membrane with automated penstocks included for the BESS, and for substations where required. Penstocks will be tested on a regular basis (both automated and manual shut off options). Should repairs be required then this should be undertaken promptly; • The inverters will be typically set on blocks 100-150mm or concrete plinth above the surrounding ground level. Other ancillary buildings will likely consist of temporary style modular buildings over a concrete pad that provides a 150mm freeboard above the surrounding ground level; • Access tracks will be constructed of a permeable surface, with additional passive drainage features such as shallow ditches and filter drains that are located downstream of or run parallel with the tracks; • The land underneath and between the rows of Solar PV Arrays will be sown as grassland/wildflower meadow which will be maintained to a suitable height using machinery such that the plants will slow the rate of contact between rainfall and the soil through this phase of the Scheme. The provision of ground cover year-round will reduce soil erosion, contribute to greater interception/evapotranspiration of rainfall thereby slowing the rate of runoff across the Order Limits; • The same water neutrality options outlined for construction have been given priority to reduce the supply requirements. These options include rainwater harvesting, on-Site water storage and water tankering (to meet peak demand).	

Potential Impact	Mitigation/Enhancement Measure	Monitoring Requirements
	• Wastewater from welfare facilities will be contained within sealed systems and tankered from the Order Limits; • As far as practicable temporary internal haul routes will be designed to avoid drainage ditches and watercourses, the crossing type will be secured through the detailed CEMP; • Where practicable, existing access tracks would be retained to limit the requirement to develop new access which can disturb soils and lead to compaction. Where new access tracks are required, they would be designed to avoid crossing drainage ditches, where practicable. Appropriate soil handling and storage protocols are set out in the **Outline Soil Resource and Management Plan [EN0110014/APP/7.9]**. A **Preliminary Surface Water Drainage Maintenance Schedule** is provided within Appendix A of this **Outline OEMP [EN0110014/APP/7.2]**.	

3.6 Cultural Heritage

Table 3.5: Cultural Heritage

Potential Impact	Mitigation/Enhancement Measure	Monitoring Requirements
Operational phase impacts upon Heritage / Archaeology assets	Mitigation that has been embedded into the Scheme by design includes the avoidance of archaeologically sensitive areas and areas considered to cause an indirect impact to the significance of heritage assets through their setting. **Site 3:** • Setback of c.350m from northern boundary of Site 3 Order Limits away from Lundy Green to ensure reduced or removed visibility from listed buildings within the settlement. • Visual screening comprising a linear native broadleaf tree belt is proposed at the field boundary to the north of an area of solar arrays address visibility from the listed buildings within Lundy Green. **Site 4:** • Setback of c.475m from the southern Order Limits of Sub-Site 4B to ensure reduced or removed visibility from the Grade I Listed Church of St Michael and other listed buildings within the settlement of Stratton St Michael. • Visual screening in the form of a linear native broadleaf tree belt is proposed at the field boundary to the south of the solar arrays within Sub-Site 4B to further restrict visibility from the listed buildings in Stratton St Michael.	No monitoring required.

Potential Impact	Mitigation/Enhancement Measure	Monitoring Requirements
	• Visual screening including native hedgerow with trees is proposed at the southern boundary of Sub-Site 4A to restrict oblique views from The Cedars (Grade II Listed Building). **Site 5:** • Setback of c.365m from the southern Order Limits of Sub-Site 5B to remove and/or reduce visibility from the Grade I listed Church of St Margaret, Fritton Conservation Area and two Grade II listed buildings. • Visual screening including a linear native broadleaf tree belt and enhanced hedgerows is proposed to remove/reduce visibility of built elements of the Scheme (solar arrays) from the Grade I listed Church of St Margaret, Fritton Conservation Area and two Grade II listed buildings. **Site 6:** • Site 6 will be retained as open agricultural land removing potential setting impacts on three Grade II Listed Buildings: The Firs, The Haven and Poacher's Cottage. **Sub-Sites 7A-7D:** • Setbacks of c.100m to c.240m from the southern boundary of Sub-Site 7C to reduce visibility from two Grade II listed buildings, Wood Farmhouse and Grove Farmhouse. • Setback of c.180m from the northern boundary of Sub-Site 7D to remove/reduce visibility from Saxlingham Green Conservation Area and encompassed listed buildings. • Visual screening comprising a combination of native broadleaf woodland and linear native tree belts is proposed to be situated	

Potential Impact	Mitigation/Enhancement Measure	Monitoring Requirements
	between the solar arrays within Sub-Site 7C and the two Grade II listed buildings to the south. • Visual screening in the form of native broadleaf woodland is proposed between the solar arrays within Sub-Site 7D and the south-western corner of Saxlingham Green Conservation Area to further remove/reduce visibility. **Sub-Sites 7I-7L**: • Visual screening in the form of infill planting of the existing hedgerows and introduction of new native broadleaf woodland is proposed at the eastern boundary of Sub-Site 7L to reduce visibility from the Grade II* listed Oaks Farmhouse. **Site 8:** • Enhancement of existing hedgerow lining is proposed at the footpath that transects Sub-Site 8B to reduce visibility of solar arrays from the listed buildings to the north. **Site 9:** • Increased visual screening in the form of tree planting is proposed within gaps in the existing hedgerow within Site 9. **Site 10**: • Visual screening in the form of native broadleaf woodland, linear native tree belts and enhanced hedgerows with trees is proposed along the boundaries where existing gaps allow for views from Grade II listed buildings to the west of Site 10. Landscape mitigation to mitigate potential adverse effects upon heritage assets will include planting of shelter belts and scattered trees, planting of new hedgerows, and existing hedgerow	

Potential Impact	Mitigation/Enhancement Measure	Monitoring Requirements
	reinforcement, as set out in the **Outline LEMP [EN0110014/APP/7.4]**.	
Operation phase impacts upon buried archaeological assets.	Where preservation in situ has been identified as embedded mitigation for buried archaeological remains during the construction phase, this will be maintained during the operation and maintenance phase. It is not envisaged that any ground disturbance is required beyond that experienced during the construction phase. If ground disturbance is required beyond that caused during the construction phase than an appropriate archaeological mitigation strategy will be identified and agreed with the archaeological advisor(s) to the LPA(s) in advance of any required works (i.e. a written scheme of investigation (WSI)). If required, archaeological works will be undertaken by suitably qualified and experienced professional archaeological specialists. All archaeological works will be undertaken in line with national guidance (i.e. Historic England and CIfA guidance). If required, works will be monitored by The Archaeological Clerk of Works and/or the Archaeological Advisors to the LPAs will monitor the completion of works in accordance with an appropriate WSI.	No monitoring required.

3.7 Transport and Access

Table 3.6: Transport and Access

Potential Impact	Mitigation/Enhancement Measure	Monitoring Requirements
Vehicle movements during operation.	Suitable points of access for operation and maintenance phase vehicles with turning areas, will be provided. The planting of landscape screening to conceal reflections from the Solar PV Panels as far as practicable, which could affect drivers on the local highway network, will be provided. Implementation of measures from the **Outline Operational Transport Management Plan (OTMP) [EN0110014/APP/7.6]** (where appropriate) during the programme of replacement for the Solar PV Panels, transformers and BESS Batteries, will be undertaken.	The overall responsibility will be with the Scheme operator. Specific responsibilities will be confirmed in the OEMP(s).
Management of permissive path.	Permissive paths will be managed through: • The provision of new non-vehicular permissive paths on each of the Sites. These permissive paths are to remain open up to 364 days per year throughout the proposed 60-year operational lifetime of the Scheme; • Permissive paths will be mown grass paths. • The Outline Public Rights of Way and Permissive Paths Management Plan (PRoWPPMP) [EN0110014/APP/7.8] will also apply to the operation and maintenance phase.	The overall responsibility will be with the Applicant. Specific responsibilities will be confirmed in the OEMP(s).
Access beyond the Order Limits	During operation, within Sub-Site 5A there will be the provision within the Order Limits to enable continued access to the Streetsend Plantation and Long Plantation. Similarly, within Sub-Site 10A there will be the provision within the Order Limits to	The overall responsibility will be with the Applicant. Specific responsibilities will

Potential Impact	Mitigation/Enhancement Measure	Monitoring Requirements
	enable continued access to the unnamed woodland block which sits outside the Order Limits. The accesses within the Order Limits to these woodland blocks will be maintained throughout the Operational Phase to prevent any of the woodland blocks from being severed as a result of the Scheme.	be confirmed in the OEMP(s).

3.8 Noise and Vibration

Table 3.7: Noise and Vibration

Potential Impact	Mitigation/Enhancement Measure	Monitoring Requirements
Impact of noise and vibration associated with operational equipment on nearby sensitive receptors.	The specification of plant machinery with low noise emission and properly attenuated supply and extract terminations will help to minimise noise emissions during the operational phase. The use of enclosures, local screening, mufflers, and silencers will also be used as appropriate. Plant such as the substation and BESS will be designed to have minimal tonal, impulsive or intermittent features as far as is practicable. Noise emitting plant will be selected with consideration of noise emissions where practicable. In addition: • Solar inverters will only operate during daytime and early morning hours (between 04:00 hours and 07:00 hours) to reduce noise during night-time hours; • Acoustic attenuators, silencers or enclosures could be applied, as required, to the BESS Inverter to reduce sound levels at the source; • BESS fan speeds could be controlled via an automated timer such that reduced fan speeds can be utilised during night-time and early morning periods; • The orientation of BESS cooling fans will be considered to reduce noise impacts at nearby receptors; • Inverters will, where practicable and necessary, be designed to mitigate tonal elements during the detailed design stage;	Site staff will carry out regular monitoring and maintenance of equipment. This will include identifying any changes in sound pitches or volume and carrying out the relevant maintenance. Where noise changes are identified or when complaints are received, noise emissions will be compared with those which are committed to. Where they are found to be above the levels which are committed to, mitigation will be applied as required. The complaints procedure will also be managed in consultation with the LPA, and the process will be reviewed annually.

Potential Impact	Mitigation/Enhancement Measure	Monitoring Requirements
	• Noise emissions will be one of the criteria evaluated when procuring appropriate equipment for use on the Site; • Where required, manufacturer-supplied noise mitigation will be installed; • Where required, noise generating equipment will be enclosed / containerised; and. • A 4m high acoustic fence will be included around the BESS Enclosure. The following will apply at receptors NSR2A, NSR2B, NSR3A and NSR3B, which are most likely to be impacted by the BESS: • The overall night-time and early morning period free-field rating level from the Scheme at receptor facades shall not exceed the sound levels set out in **ES: Chapter 12 - Noise and Vibration [EN0110014/APP/6.1.12]**, or 30 dB $L_{Ar,Tr}$, whichever is higher. • The overall daytime and evening free-field rating level from the Scheme at receptor facades shall not exceed the sound levels set out in **the Evening Noise Assessment [EXAM/9.21]** or 30 dB $L_{Ar,Tr}$, whichever is higher. The following will apply at all other receptors: • The overall sound level from the Scheme along the PRoW will not exceed 55 dBA, and will be mitigated where practicable to not to exceed 50 dBA. • Integrated Conversion Units/33kV Sub-Distribution Switch Rooms will be located or mitigation applied to ensure that the overall free-field rating level from the Scheme at receptor facades shall not exceed the background sound level or 30 dB $L_{Ar,Tr}$, whichever is higher. • Standalone Conversion Units will be located or where this not practicable, mitigation applied to ensure that the overall free-field rating level from the	Further details are to be confirmed in the detailed OEMP(s).

Potential Impact	Mitigation/Enhancement Measure	Monitoring Requirements
	Scheme at receptor facades shall not exceed the background sound level or 30 dB $L_{Ar,Tr}$, whichever is higher. • Project Substations to be sited at locations to make sure that the overall free-field rating level from the Scheme at receptor facades shall not exceed the background sound level or 30 dB $L_{Ar,Tr}$, whichever is higher.	

3.9 Air Quality

Table 3.8: Air Quality

Potential Impact	Mitigation/Enhancement Measure	Monitoring Requirements
BESS fire emissions.	The necessary mitigation measures are secured in the **Outline BSMP [EN0110014/APP/7.5]**.	Refer to the **Outline BSMP [EN0110014/APP/7.5]**:
Back-up generator emissions.	• The back-up generators will adhere to Stage V emissions standards (Ref 1-5) and seek alternatives where practicable, such as batteries or alternative fuel. • Should a diesel generator be used at the 33kV Sub distribution Switch Rooms and substation, appropriate buffer distances will be applied as practicable and testing will be kept to a minimum.	The overall responsibility will be with the Applicant.
Vehicle emissions from the operational maintenance activities required during operation of Scheme	Vehicles will be correctly maintained and operated in accordance with manufacturer's recommendations and in a responsible manner. All plant and vehicles will be required to switch off their engines when not in use and when it is safe to do so. In addition, plant and vehicles will conform to relevant applicable standards for the vehicle type as follows: • Euro 4 (Oxides of Nitrogen (NOx)) for petrol cars, vans and minibuses; • Euro 6 (NOx and PM) for diesel cars, vans and minibuses; and • Euro VI (NOx and PM) for lorries, buses, coaches and Heavy Goods Vehicles (excluding specialist abnormal indivisible loads).	The overall responsibility will be with the Applicant. Specific responsibilities will be confirmed in the **OEMP(s).**

Potential Impact	Mitigation/Enhancement Measure	Monitoring Requirements
Fugitive dust emissions during replacement activities.	Good practice measures set out for construction will be reintroduced and implemented for replacement activities. Appropriate mitigation and control measures will be included in the detailed OEMP(s), which would include: **Communications:** • Develop and implement a Stakeholder Communications Plan that includes community engagement before work commences on-site; • Display the name and contact details of person(s) accountable for air quality and dust issues across the Order Limits. This may be the Environmental Manager; and • Display the Contractor's head or regional office contact information. **Dust Management:** • Develop and implement a Dust Management Plan (DMP), which may include measures to control other emissions, approved by the relevant local authorities. **Site Management:** • Record all dust and air quality complaints, identify cause(s), take appropriate measures to reduce emissions in a timely manner, and record the measures taken; • Make the complaints log available to the local authority when asked;	The overall responsibility will be with the Applicant. Specific responsibilities will be confirmed in the OEMP(s). The following monitoring will be undertaken: • Undertake daily on-site and off-site inspection, where receptors (including roads) are nearby, to monitor dust, record inspection results, and make the log available to the local authorities when asked. This should include regular dust soiling checks of surfaces such as street furniture, cars and windowsills within 100 m of site boundary, with cleaning to be provided if necessary; • Carry out regular site inspections to monitor compliance with the DMP, record inspection results, and make an inspection log available to the local authorities when asked; • Increase the frequency of site inspections by the person accountable for air quality and dust issues on site when activities with a high potential to produce dust are being carried out and during

Potential Impact	Mitigation/Enhancement Measure	Monitoring Requirements
	• Record any exceptional incidents that cause dust and/or air emissions, either on- or off-site, and the action taken to resolve the situation in the logbook; and • Hold regular liaison meetings with other high risk construction sites within 250 m of the site boundary, to ensure plans are co-ordinated and dust and particulate matter emissions are minimised. It is important to understand the interactions of the off-site transport/deliveries which might be using the same strategic road network routes. **Preparing and maintaining the site:** • Creation of new woodland belts and native tree planting and restoration of key hedgerows which can be beneficial in terms of trapping and absorbing air pollutants; • The Outline **Landscape Ecology Management Plan (LEMP) [EN0110014/APP/7.4]** seeks to increase green infrastructure, where appropriate; • Plan site layout so that machinery and dust causing activities are located away from receptors, as far as is reasonably practicable; • Erect solid screens or barriers around dusty activities or the site boundary so that are at least as high as any stockpiles on site; • Fully enclose site or specific operations where there is a high potential for dust production and the site is active for an extensive period;	prolonged dry or windy conditions; and • Agree dust deposition, dust flux, or real-time PM_{10} / $PM_{2.5}$ continuous monitoring locations with the local authority. Where practicable, commence baseline monitoring at least three months before work commences on site or, if it a large site, before work on a phase commences. Any unforeseen issues that arise in relation to vehicle movements will be logged by the Site Manager. If necessary, the issues will be discussed with the local highway authority so that they can be resolved as appropriate.

Potential Impact	Mitigation/Enhancement Measure	Monitoring Requirements
	• Seek to avoid site runoff of water or mud; • Keep site fencing, barriers and scaffolding clean using wet methods. • Remove materials that have a potential to produce dust from site as soon as practicable, unless being re-used on site. If they are being re used on-site, cover as described below; and • Cover, seed or fence stockpiles to prevent wind whipping. **Operating vehicle/machinery and sustainable travel:** • Ensure all off-road vehicles comply with the requirements of the Non Road Mobile Machinery (NRMM) standards (Ref 1-5), where applicable. Use stage 4 NRMM as a minimum and stage 5 where practicable; • Ensure all vehicles/machinery are switched off when stationary/not in use; • Avoid the use of diesel- or petrol-powered generators and use mains electricity or battery powered equipment where practicable; • Impose and signpost a maximum-speed-limit of 15 mph on surfaced and 10 mph on unsurfaced haul roads and work areas (if long haul additional control measures provided, subject to the approval of the nominated undertaker and with the agreement of the local authorities, where appropriate);	

Potential Impact	Mitigation/Enhancement Measure	Monitoring Requirements
	• Implement a Travel Plan that supports and encourages sustainable travel (public transport, cycling, walking, and car-sharing); and • Signs to direct construction vehicles associated with the Scheme will be installed along the construction traffic route. **Operations:** • Only use cutting, grinding or sawing equipment fitted or in conjunction with suitable dust suppression techniques such as water sprays or local extraction, e.g. suitable local exhaust ventilation systems; • Ensure an adequate water supply on the site for effective dust/particulate matter suppression/mitigation, using non-potable water where practicable and appropriate; • Use enclosed chutes and conveyors and covered skips; • Minimise drop heights from conveyors, loading shovels, hoppers and other loading or handling equipment and use fine water sprays on such equipment wherever appropriate; and • Ensure equipment is readily available on site to clean any dry spillages and clean up spillages as soon as reasonably practicable after the event using wet cleaning methods. **Waste Management:** • No bonfires or burning of waste materials. **Earthworks:**	

Potential Impact	Mitigation/Enhancement Measure	Monitoring Requirements
	• Re-vegetate earthworks and exposed areas/soil stockpiles to stabilise surfaces as soon as practicable; • Use Hessian, mulches or tackifiers where it is not possible to re vegetate or cover with topsoil, as soon as practicable; and • Only remove the cover in small areas during work and not all at once. **Trackout:** • Use water-assisted dust sweeper(s) on the access and local roads, to remove, as necessary, any material tracked out of the site; • Avoid dry sweeping of large areas. In dry conditions, areas near to the site access will be sprayed with water supplied to prevent the spread of dust; • Ensure vehicles entering and leaving sites are covered to prevent escape of materials during transport; • Inspect on-site haul routes for integrity and instigate necessary repairs to the surface as soon as reasonably practicable; • Record all inspections of haul routes and any subsequent action in a site logbook; • Install hard surfaced haul routes, which are regularly damped down with fixed or mobile sprinkler systems, or mobile water bowsers and regularly cleaned; • Implement a wheel washing system (with rumble grids to dislodge accumulated dust and mud prior to leaving the site	

Potential Impact	Mitigation/Enhancement Measure	Monitoring Requirements
	where reasonably practicable). A wheel washing facility will be provided at each access. This will be located at the end of each access road, ahead of the egress onto the local highway network; • A visual inspection of vehicles will be undertaken before they depart the Order Limits, to ensure that they are not carrying any residual debris onto the highway; • If required, a road sweeper will be provided for the area surrounding access to alleviate any residual debris generated during the construction phase, as required; • Ensure there is an adequate area of hard surfaced road between the wheel wash facility and the site exit, wherever site size and layout permits; and • Entrance gates to be located at least 10 m from receptors where practicable.	

3.10 Socio-Economics

Table 3.9: Socio-Economics

Potential Impact	Mitigation/Enhancement Measure	Monitoring Requirements
Disruption to local residents, businesses and community facilities	Primary mitigation measures are embedded within the Scheme, as set out in the respective ES chapters, to reduce operational effects (such as noise, air quality, transport, and landscape and visual) which in turn will mitigate the effects on the local community and existing facilities from a socio economic and land use perspective. During the operational phase, the Applicant will embed initiatives to sustain long-term skills development and other benefits to the community. This will include offering site tours for schools and colleges, delivering educational outreach on solar energy, and supporting summer internship and research programmes. The Applicant will also explore sponsoring local students and running green energy awareness campaigns to raise understanding of the sector. These measures will be coordinated with South District Norfolk Council and other local partners as set out in the **Outline Employment, Skills and Supply Chain Strategy [EN0110014/APP/7.10]**. Repair, upgrade and replacement of existing PRoW furniture and re-establishment of hedgerow gaps. New non-vehicular permissive paths will also be installed, which would be open up to 364 days per year throughout the proposed 60-year operational lifetime of the Scheme. The potential to locate temporary workers, during periods of scheduled replacement activities, in either private rental accommodation or in	To be confirmed in the detailed OEMP(s).

Potential Impact	Mitigation/Enhancement Measure	Monitoring Requirements
	temporary serviced accommodation to moderate the level of demand for temporary accommodation will be considered to mitigate impacts on accommodation demand for both residents, and visitors and tourists. Measures to mitigate the effects of operational traffic are outlined in **Table 3.7.**	
Visual impact on tourism and recreation facilities	The embedded visual mitigation includes designing the preliminary layout of the Sites to provide suitable buffers from roads, PRoW, and neighbouring tourism destinations. These buffers, along with minimal on-site activity during general operation and maintenance, help to mitigate impacts on the durability of tourism receptors, and on formal recreational sport and youth play facilities near to or within view of the Scheme during its operational lifetime. Furthermore, proposed landscaping planting is likely to mature over the lifetime of the Scheme, which will mitigate effects of the Scheme on the surrounding landscape and amenity for residents and tourists. Measures to mitigate visual impacts are set out in this **Outline LEMP [EN0110014/APP/7.4].** These mitigation measures, such as noise attenuation, glint and glare mitigation, and additional landscape screening to residential and other sensitive receptors will help to reduce overall impacts on tourism and recreational receptors such as tourist attractions, recreation centres, and recreational routes in the proximity of the Scheme. General operational and maintenance traffic will be directed to using access and travel routes most appropriate for the vehicle type required.	To be confirmed in the detailed OEMP(s). To be confirmed in the detailed LEMP.
Disruption to users of PRoW during operation	Any diversions to PRoW and other recreational routes, if required during infrastructure replacement activities events, will be temporary with original routing restored as soon as practicable, appropriately signed, managed and the duration and length of diversions will be optimised to minimise impacts	To be confirmed in the detailed OEMP(s). To be confirmed in the detailed PRoWPPMP.

Potential Impact	Mitigation/Enhancement Measure	Monitoring Requirements
Disruption to users of PRoW during peak operational and maintenance periods	on accessibility and use. An **Outline PRoWPPMP [EN0110014/APP/7.8]** outlines these measures.	

3.11 Soils and Agriculture

Table 3.10: Soils and Agriculture

Potential Impact	Mitigation/Enhancement Measure	Monitoring Requirements
Potential for surface soil compaction and disturbance in some areas due to maintenance work. For example, grassed access alleys traversed by light vehicles for Site maintenance could cause surface compaction in damp or wet soil conditions.	A Soil Resources Management Plan (SRMP) will detail how the risk of causing surface compaction can be minimised and how to remove compaction if it has occurred. Examples include specification of vehicles used for any trafficking off access tracks, minimising travel over the land in vehicles when ground conditions are wet, placement and movement of any livestock troughs and site inspection by a suitably experienced soil scientist to monitor for the emergence of any soil compaction issues. The SRMP will be prepared in accordance with the **Outline SRMP [EN0110014/APP/7.9]** as secured via a requirement in the DCO. Maintenance work on solar arrays and equipment in relation to soil and land disturbance will be carried out in accordance with the SRMP. There may be the opportunity for land beneath the Solar PV Panels to be grazed by sheep although the ES assumes that all grassland will be managed by machinery as a default position.	Soil assessments and monitoring will be undertaken as detailed in the SRMP.

3.12 Human Health

Table 3.11: Human Health

Potential Impact	Mitigation/Enhancement Measure	Monitoring Requirements
Disruption to the local community	A Community Liaison Manager will be appointed as a temporary facilitator of communications between communities and the Scheme's operators during the peak replacement scenario. During long-term general operation and maintenance activities, a full-time member of the Scheme's operation and maintenance team should also be in dedicated 'community contact' position whereby they are responsible for monitoring community interaction to ensure community concerns are heard, responded to and suitably addressed throughout the duration of the Scheme's operation and maintenance phase. Details of the Community Liaison Manager within the operation and maintenance team should be made available to members of the public through elected representatives or online, and kept up-to date at all times. This will therefore reduce the likely significance of effect on human health in the communities most affected by the Scheme. The Scheme will include enhancements to existing PRoWs and provide new non-vehicular permissive paths.	To be confirmed in the detailed OEMP(s).

3.13 Ground Conditions

Table 3.12: Ground Conditions

Potential Impact	Mitigation/Enhancement Measure	Monitoring Requirements
The discovery of ground contamination during groundworks	Embedded measures included at the Construction Phase will continue to provide mitigation during the Operational Phase, e.g., avoidance of a potential hazard as part of the design of the Scheme means that the hazard will not be encountered during operation.	The Environmental Manager would regularly record compliance in a log book. The detailed OEMP(s) would detail the frequency.

3.14 Minerals

Table 3.13: Minerals

Potential Impact	Mitigation/Enhancement Measure	Monitoring Requirements
As a result of the nature of the Scheme, no mitigation measures have been identified during the operation and maintenance phase of the Scheme for Minerals.	N/A	N/A

3.15 Materials and Waste

Table 3.14: Materials and Waste

Potential Impact	Mitigation/Enhancement Measure	Monitoring Requirements
Impacts of waste to the surrounding environment. **Potential to impact on sensitive receptors (humans, wildlife, and controlled waters) if not stored and managed appropriately.** **Impacts on waste recycling and handling facility capacity.**	During the operation and maintenance phase, the Scheme will adhere to the waste hierarchy by prioritising waste prevention, followed by the reuse, recycling, and recovery of equipment during the replacement of components. Landfill disposal will be considered only as a last resort. A Site Waste Management Plan will be developed for the operation and maintenance phase of the Scheme to ensure operational waste is managed suitably, and that waste arisings are sent for handling at facilities within the waste local authorities that have capacity to do so, without adversely impacting upon their capacity to handle waste arisings for all other waste streams in the authority area. All waste management will comply with relevant regulations, and waste will be transported by licensed hauliers to authorised waste management sites with the necessary permits for the consigned wastes. The Scheme is expected to generate WEEE during both the Operational Phase, and during the Decommissioning Phase. This includes PV Panels and smaller quantities from Ancillary Infrastructure. These items will be recovered and recycled by an authorised reprocessor in compliance with the WEEE Regulations 2013 (Ref 18-58). To ensure this is done according to 'Best Available Treatment Recovery and Recycling Techniques', a list of up-to-date authorised reprocessors should be established prior to the Operational Phase of the Scheme and kept up-to-date throughout the Operational Phase and Decommissioning.	The types, quantities and final destination of waste generated during the construction phase would be identified, measured and recorded. A register of all waste loads leaving the Order limits would be maintained to provide a suitable audit trail for compliance purposes and to facilitate monitoring and reporting of waste types, quantities and management methods.

Potential Impact	Mitigation/Enhancement Measure	Monitoring Requirements
	Batteries must be separated from WEEE streams so they can be recovered, recycled, or disposed of in accordance with the Waste Batteries and Accumulators Regulations 2009 (Ref 18-59). This is most likely to be undertaken by the battery manufacturer or supplier. This requirement will be secured ahead of the Scheme's Operational Phase to ensure it is undertaken as legally required throughout the Operational and Decommissioning Phases of the Scheme. Excavated material reuse would be determined via the Site Waste Management Plan in accordance with the *Definition of Waste: Development Industry Code of Practice* (DoW CoP) exemption or environmental permit. Materials requiring removal from the Order limits during operation would be transported using licensed carriers and records kept, detailing the types and quantities of waste moved and the destinations of this waste, in accordance with the relevant regulations. Infrastructure such as PV panels and battery storage units that need to be replaced during the Operational Phase, will be removed and recycled as far as practicable and in accordance with legislation and guidance applicable at the time, or if more suitable at the time, sold for refurbishment and reuse. The Applicant will adhere to the industry good practice outlined in Solar Power Europe's Lifecycle Quality Best Practice Guidance (Ref 18-95).	

Potential Impact	Mitigation/Enhancement Measure	Monitoring Requirements
	Where significant cumulative effects on hazardous waste handling facilities from the replacement works of multiple Nationally Significant Infrastructure Projects are assessed as likely to occur, a coordinated approach between site operators of those relevant Nationally Significant Infrastructure Projects should be secured ahead of the commencement of replacement activities. This should include measures, as necessary, to stagger replacement works across Nationally Significant Infrastructure Projects, staggering the delivery of hazardous waste arisings requiring treatment to relevant facilities, and securing suitable and safe hazardous waste storage if required to delay delivery to hazardous waste treatment facilities, to reduce overloading of hazardous waste facilities.	

3.16 Telecommunications, Television Reception and Utilities

Table 3.15: Telecommunications, Television Reception and Utilities

Potential Impact	Mitigation/Enhancement Measure	Monitoring Requirements
Utilities, Telecommunications and Television Receptors	During the operational and maintenance phase, there will be safe working beneath any overhead lines in line with National Grid's technical guidance note 287 (Ref 1-7), including, for example, ensuring adequate clearances are in place when plant and equipment are being moved beneath overhead lines, and limiting any planting beneath overhead lines to low growing species. Measures in relation to safe working near buried utilities, particularly gas pipelines, will be in place at all phases of the Scheme. For example safety measures set out in National Grid and Northern Gas Networks guidance documents for third parties working in the vicinity of high pressure gas pipelines and associated installations (Ref 1-8, Ref 1-9) and the HS(G)47 guidance (Ref 1-10).	No monitoring required.

3.17 Glint and Glare

Table 3.16: Glint and Glare

Potential Impact	Mitigation/Enhancement Measure	Monitoring Requirements
Glint and Glare effects	• Screening in the form of proposed vegetation such as mature tree and shrub planting for separate 300m, 400m and 500m sections of the B1527 and 46 dwellings will be used to obstruct views of reflecting panels. Full details regarding the landscape mitigation are presented in the **Outline Landscape and Ecology Management Plan [EN0110014/APP/7.4]**. • Where practicable and necessary, the impact of glint and glare can be mitigated by changing the backtracking angle to tilt solar reflections away from receptors. Further mitigation can be implemented by changing the configuration of panels, such as the azimuth, tilt (for fixed panels) and backtracking angle (for single-axis tracking panels). • Additionally, existing vegetation along the boundary of the Order limits will be retained and managed where practicable to ensure its continued presence and to aid the screening of low-level views into the Order limits.	Refer to the **Outline LEMP.**

3.18 Electromagnetic Fields

Table 3.17: Electromagnetic Fields

Potential Impact	Mitigation/Enhancement Measure	Monitoring Requirements
Potential for risks to human health associated with electromagnetic fields.	The following embedded mitigation measures have been incorporated into the Scheme design: • For overhead lines, a setback distance of at least 15m from the existing 400kV overhead cables is to be maintained between the overhead cables, and receptors pertaining to human health; based on the distance at which the electrical field strength for a 400kV overhead cable is below the threshold value of 5kV m-1;The majority of cables installed at the site will be underground cables.; • For overhead lines, a setback distance of at least 15m from the existing 400kV overhead cables is to be maintained between the overhead cables, and receptors pertaining to human health; • All proposed cables and associated electrical infrastructure will be 'UKCA' and/or 'CE' marked; and • The mitigation measures, such as the electrical infrastructure and depth of underground cables is outlined in the Design Principles, Parameters and Commitments.	The Environmental Manager will regularly record compliance in a logbook.

3.19 Major Accidents and Disasters

Table 3.18: Major Accidents and Disasters

Potential Impact	Mitigation/Enhancement Measure	Monitoring Requirements
Major Accident or Disasters.	BESS containers will have built in safety features, including cooling systems, fire resistant construction, fire detection, suppression systems, emergency stop functions, and isolation monitoring. All works will be undertaken in accordance with relevant Health and Safety legislation and guidance. Details of fire, police, emergency services and hospitals will be publicised and included in the site induction. Security measures will be in place throughout the phases of the scheme, reducing the likelihood of crime and terrorism. This includes motion sensing security lighting, perimeter fencing, and CCTV. An **Outline BSMP [EN0110014/APP/7.5]** has been produced for the Scheme. This will be developed into a detailed BSMP for the Operational Phase substantially in accordance with the principles of the Outline BSMP.	No monitoring required.

4 Mitigation and Monitoring – National Grid Substation and Grid Connection Infrastructure

4.1 Purpose

4.1.1 This Section of the Outline OEMP sets out the mitigation and management measures to be included as a minimum in the detailed OEMP, pertaining to the National Grid Substation and Grid Connection Infrastructure only. It also identifies where monitoring is proposed to assess the effectiveness of the mitigation measures. These components of the Scheme will be operated by National Grid Electricity Transmission plc (NGET).

4.2 Climate Change

Table 4.1: National Grid Substation and Grid Connection Infrastructure, Climate Change

Potential Impact	Mitigation/Enhancement Measure	Monitoring Requirements
Greenhouse gas emissions from the operational maintenance activities required during operation of Scheme Stronger winds, heatwaves, heavy precipitation and flood risk and increased risk of fires/wildfires.	Where applicable, the construction embedded mitigation measures as outlined in the **Outline CEMP [EN0110014/APP/7.1]** will be put in place during operational phase to optimise efficiency and will be outlined in the detailed **OEMP**, to be prepared in accordance with this **Outline OEMP.** The measures outlined within this Outline OEMP have been prepared in accordance with the following: • The National Grid Substation has been sequentially located to an area with a "Low probability of flooding" outside of Flood Zones 2 and 3 to mitigate against the risk of flooding. • Using equipment's cooling systems where necessary/adapting working practices and equipment used based on current weather conditions. • Protecting workers and resources from extreme weather conditions through appropriate PPE and working practices as secured through the detailed OEMP. • Monitoring weather forecasts and the news for Environment Agency flood warnings, relevant weather warnings, and water levels of the local waterways. • Regular planned maintenance of the Scheme will be conducted to optimise efficiency of the Scheme infrastructure.	The overall responsibility will be with NGET. Specific responsibilities will be confirmed in the detailed OEMP. Monitoring weather forecasts and the news for Environment Agency flood warnings, relevant weather warnings, and water levels of the local waterways. Refer to the **Outline BSMP.**

Potential Impact	Mitigation/Enhancement Measure	Monitoring Requirements
	• Increasing recyclability by segregating waste to be re used and recycled where reasonably practicable. • Off-site reuse, recycling and recovery of materials and waste where reuse on site is not practicable. • Operating the Scheme in such a way as to minimise the creation of waste and maximise the use of alternative materials with lower embodied carbon such as locally sourced products and materials with a higher recycled content. • Encouraging the use of lower carbon modes of transport by identifying and communicating local bus connections and pedestrian and cycle access routes to/from the Scheme to all staff. • Off-site prefabrication will be undertaken where practicable, including use of prefabricated elements. • Switching off vehicles and plant when not in use and ensuring vehicles conform to current UK emissions standards; and • Using equipment's cooling systems where necessary and adapting working practices and equipment used based on current weather conditions. • In terms of high precipitation and increase in storm intensity, **ES: Chapter 9 - Water Environment [EN0110014/APP/6.1.9]** describes water management measures to control surface water run-off and drain hardstanding and other structures.	

4.3 Landscape and Visual

Table 4.2: National Grid Substation and Grid Connection Infrastructure, Landscape and Visual

Potential Impact	Mitigation/Enhancement Measure	Monitoring Requirements
Loss of existing landscape features (e.g., vegetation). Visibility of operational activities.	This **Outline LEMP [EN0110014/APP/7.4]** sets out the measures proposed to mitigate the potential impacts and effects on landscape (and biodiversity) features, and to enhance the landscape and biodiversity value of the National Grid Substation and Grid Connection Infrastructure areas. A detailed LEMP will be prepared in accordance with the principles of the **Outline LEMP [EN0110014/APP/7.4]** and will be submitted to and approved by the relevant planning authority or authorities. This will include measures to ensure landscape mitigation and enhancements are established and maintained into and throughout the operational phase. **General Offsets/Buffers:** Buffers outlined in **ES: Chapter 4 - The Scheme [EN0110014/APP/6.1.4]** and secured through the **Design Principles, Parameters and Commitments [EN0110014/APP/7.18]**, have been embedded into the design of the National Grid Substation and Grid Connection Infrastructure to protect the landscape fabric of the Site, as well as standard offsets/buffers identified that have been applied. **Landscape Design Parameters:** Key design landscape and visual embedded mitigation measures are set out in the **ES: Chapter 7 - Landscape and Visual [EN0110014/APP/6.1.7]** and	Specific measures will be confirmed in the detailed LEMP.

Potential Impact	Mitigation/Enhancement Measure	Monitoring Requirements
	secured through **Design Principles, Parameters and Commitments [EN0110014/APP/7.18].** **Lighting:** • Security lighting within the National Grid Substation would use motion detection sensors for operational and security purposes; and • Good practice measures would be employed to minimise light spill. The lighting design will seek to limit any impacts on sensitive receptors through directional cowls. **Proposed Planting:** Proposed planting approach is detailed within the **Outline LEMP [EN0110014/APP/7.4].** The following approach has been taken to the planting strategy, as detailed in the **Outline LEMP [EN0110014/APP/7.4]**: • Retention of the majority of existing landscape features within and around the boundaries of the National Grid Substation Site, namely mature hedgerows and tree cover which contribute to the landscape character of the local context. • Offset and buffering of the Scheme with new, woodland, hedgerow and tree planting to mitigate potential views from the nearby PRoW, roads and residential dwellings in close proximity to the Site. • In addition to the establishment of new hedgerow and hedgerow trees, the embedded mitigation also includes the retention, gapping up and enhancement of existing hedgerow within the Site. New planting species	

Potential Impact	Mitigation/Enhancement Measure	Monitoring Requirements
	would be native, locally prevalent and also include a mixture of deciduous and evergreen species to provide year-round screening. The long-term management and maintenance of existing and new vegetation is an embedded mitigation measure which ensures vegetation would be actively managed in the long term, as secured and detailed within the **Outline LEMP [EN0110014/APP/7.4]**. The prescribed maintenance height of hedgerow at 3m is an embedded mitigation measure which aims to screen views towards taller elements of the National Grid Substation and Grid Connection Infrastructure from nearby PRoW. The active management and maintenance of trees and woodland within the Site, both newly planted and existing, aims to ensure they not only survive but reach maturity and establishment in the medium to long term durations. Setting back the Scheme from key landscape features within and adjacent to the Site, such as trees, hedgerow and woodland. The minimum offsets/buffers from existing landscape features are outlined fully in **ES: Chapter 4 - The Scheme [EN0110014/APP/6.1.4]**. The Scheme would be offset from existing PRoW by a minimum of 15m, to respect the amenity and experience for PRoW users along existing routes and allow for the sowing of extensive areas of new grassland along the margins of the Scheme.	
Impacts on arboricultural features during the operation of the Scheme	**Arboricultural Protection:** The Scheme has been designed, as far as practicable, to avoid and reduce impacts and effects on Arboriculture by embedding mitigation measures into the design process. This is set out in **ES: Appendix 7.10 Preliminary Arboriculture Impact Assessment [EN0110014/APP/6.3.7.10]** All maintenance and replacement activities near veteran trees will be supervised by an Arboricultural Clerk of Works (ACoW) to ensure no	Specific measures will be confirmed in the detailed LEMP.

Potential Impact	Mitigation/Enhancement Measure	Monitoring Requirements
	machinery or materials enter the Veteran tree buffer zone. This may be achieved through implementation of ground protection and/or tree protection fencing around the veteran tree buffer zones during maintenance and replacement activities.	

4.4 Ecology and Biodiversity

Table 4.3: National Grid Substation and Grid Connection Infrastructure, Ecology and Biodiversity

Potential Impact	Mitigation/Enhancement Measure	Monitoring Requirements
Impacts on biodiversity features during the operation of the Scheme	**Habitats:** During the operational phase, habitat management and maintenance works will be timed, where appropriate, to avoid ecologically sensitive periods, for example hedgerow maintenance will avoid nesting bird season. Details of this are prescribed within the **Outline LEMP [EN0110014/APP/7.4]**. **Bats:** Motion sensing security lighting will be provided within National Grid Substation, to be used only for maintenance and security purposes. A sensitive lighting strategy as part of the detailed OEMP will specify how this artificial lighting will be installed and used, which will serve to mitigate adverse impacts on ecological receptors which are adversely impacted by lighting, such as bats. **Badger:** Should new badger setts be excavated in areas where they come into conflict with ongoing management activities, then these setts would likely be excluded under a mitigation licence from Natural England. The mitigation licence would secure any compensation measures (such as the creation of artificial setts) required, the exclusion of the setts, and would ensure any impacts to setts are compliant with current legislation.	Specific measures will be confirmed in the detailed LEMP.

4.5 Water Environment

Table 4.4: National Grid Substation and Grid Connection Infrastructure, Hydrology, Flood Risk and Drainage

Potential Impact	Mitigation/Enhancement Measure	Monitoring Requirements
The following impacts may occur without adequate mitigation: • **Impacts on water quality in waterbodies that may receive surface water runoff or be at risk of chemical spillages from supporting infrastructure for the Scheme and maintenance activities.** • **Potential for reduced chemical loading of watercourses associated with**	Mitigation that has been embedded into the Scheme by design includes: **Pollution Risk:** • The operation and maintenance, works have the potential to increase surface water runoff and transport pollutions and sediment to the watercourses. To mitigate the risk of this, the Surface Water Drainage Scheme should be designed to mitigate polluted water reaching the watercourses. This would make sure that only clean, unpolluted runoff enters the watercourses, and that damage to water quality and habitats within the watercourses and downstream waterbodies would be prevented; • The National Grid Substation will have a surface water drainage system with permeable gravel surface and lined aggregate sub-base; • All smaller fixed infrastructure (e.g. transformers) will be self-bunded to prevent any leaks from reaching the watercourse. If pollution is detected it will be suctioned to a self-bunded (or similar) tank and removed from site for suitable disposal; • Regular maintenance will be undertaken on plant and equipment to reduce the likelihood of pollution incident; • Oil drip trays (for maintenance/replacement activities) would be visually inspected and any polluting materials suctioned out and stored in a bunded tank, then once full, removed from the Order Limits for disposal;	Regular recording of compliance in a logbook. The detailed OEMP will detail the frequency.

Potential Impact	Mitigation/Enhancement Measure	Monitoring Requirements
cessation of nitrate, pesticide, herbicide and insecticide applications on arable fields, or reduction in fine sediment/soil erosion, which would be beneficial. • **Impacts on flood risk from increased runoff from new impervious areas across the Site.**	• Fuel and other potentially polluting chemicals will either be in self bunded leak proof containers or stored in a secure impermeable and bunded area (minimum capacity of 110% of the capacity of the containers), If pollution is detected it will be suctioned to a self-bunded (or similar) tank and removed from site for suitable disposal; • Security measures are set out in the Design Principles, Parameters and Commitments [EN0110014/APP/7.18]. The National Grid Substation will be kept secure to prevent vandalism that could lead to a pollution incident;. • Planned replacement of electrical infrastructure may be required over the operational lifetime of the Scheme, and this would be managed in a similar way to the construction and decommissioning phases through the implementation of measures included within a CEMP and DEMP. **Drainage and Surface Water Management:** • The National Grid Substation will be set back at least 10m from the top of bank of watercourses; • The system will be lined with an impermeable membrane to mitigate against residual risk of pollutant mobilisation into the geology beneath, with a controlled discharge to the nearest watercourse/ditch. • Connecting access tracks outside of the compound will be constructed of a permeable surface, with additional passive drainage features such as shallow ditches and filter drains that are located downstream of or run parallel with the tracks; • Where practicable, existing access tracks would be retained to limit the requirement to develop new access which can disturb soils and lead to compaction. Where new access tracks are required, they would be designed	

Potential Impact	Mitigation/Enhancement Measure	Monitoring Requirements
	to avoid crossing drainage ditches, where practicable. Appropriate soil handling and storage protocols are set out in the **Outline Soil Resources and Management Plan [EN0110014/APP/7.9].**	

4.6 Cultural Heritage

Table 4.5: National Grid Substation and Grid Connection Infrastructure, Cultural Heritage

Potential Impact	Mitigation/Enhancement Measure	Monitoring Requirements
Operational phase impacts upon Heritage / Archaeology assets	Mitigation that has been embedded into the Scheme by design includes the avoidance of archaeologically sensitive areas and areas considered to cause an indirect impact to the significance of heritage assets through their setting. In locations with heritage assets that could be impacted by the Scheme through their settings, enhanced visual screening through vegetation (and distance offsets are proposed). Landscape mitigation to mitigate potential adverse effects upon heritage assets will include planting of shelter belts and scattered trees, planting of new hedgerows, and existing hedgerow reinforcement.	No monitoring required.
Operational phase impacts upon buried archaeological assets.	Where preservation in situ has been identified as embedded mitigation for buried archaeological remains during the construction phase, this will be maintained during the operational phase. It is not envisaged that any ground disturbance or additional piling is required beyond that experienced during the construction phase. If ground disturbance is required beyond that caused during the construction phase than an appropriate archaeological mitigation strategy will be identified and agreed with the NCCHET in advance of any required works (i.e. a written scheme of investigation (WSI)). If required, archaeological works will be undertaken by suitably qualified and experienced professional archaeological specialists. All archaeological works	No monitoring required.

Potential Impact	Mitigation/Enhancement Measure	Monitoring Requirements
	will be undertaken in line with national guidance (i.e. Historic England and CIfA guidance). If required, works will be monitored by the Archaeological Clerk of Works and/or the NCCHET will monitor the completion of works in accordance with an appropriate WSI.	

4.7 Transport and Access

Table 4.6: National Grid Substation and Grid Connection Infrastructure, Transport and Access

Potential Impact	Mitigation/Enhancement Measure	Monitoring Requirements
Vehicle movements during the operational phase.	Suitable points of access for operation and maintenance phase vehicles with turning areas will be provided. Implementation of measures from the **Outline OTMP [EN0110014/APP/7.7]** (where appropriate) during the programme of replacement for the Transformers.	The overall responsibility will be with NGET. Specific responsibilities will be confirmed in the detailed OEMP.

4.8 Noise and Vibration

Table 4.7: National Grid Substation and Grid Connection Infrastructure, Noise and Vibration

Potential Impact	Mitigation/Enhancement Measure	Monitoring Requirements
Impact of noise and vibration associated with operational equipment on nearby sensitive receptors.	The specification of plant machinery with low noise emission and properly attenuated supply and extract terminations will help to minimise noise emissions during the operational phase. The use of enclosures, local screening, mufflers, and silencers will also be used as appropriate. Plant within the National Grid Substation will be designed to have minimal tonal, impulsive or intermittent features as far as is practicable. The National Grid Substation will be located or mitigation applied, to ensure that the predicted free-field façade incident rating level at the nearest residential receptors shall not exceed the background sound level or 30 dB $L_{A,Tr}$, whichever is higher. Noise source data for plant in **ES: Chapter 12 - Noise and Vibration [EN0110014/APP/6.1.12]** has been selected based on experience of similar developments. There is a requirement for flexibility in design so noise source data may not be representative of plant in the final design. Although there can be variations in noise emissions, noise emitting plant will be selected with consideration of noise emissions where practicable. In addition, the following measures will apply: • Noise emissions are one of the criteria evaluated when procuring appropriate equipment for use on the Site; • Subject to detailed design and the final specification of equipment, where required:	Site staff will carry out regular monitoring and maintenance of equipment. This will include identifying any changes in sound pitches or volume and carrying out the relevant maintenance. Where noise changes are identified or when complaints are received, noise emissions will be compared with those presented in the ES. Where they are found to be above the levels presented in the ES, mitigation will be applied as required. The complaints procedure will also be

Potential Impact	Mitigation/Enhancement Measure	Monitoring Requirements
	- acoustic barriers will be incorporated within the design of the Scheme to attenuate noise and to reduce visual impacts; - manufacturer-supplied noise mitigation will be installed; and - noise generating equipment will be enclosed/containerised. Although the indicative Scheme layout and plant selection has been optimised to minimise noise levels at sensitive receptors, there is a requirement to retain some flexibility with respect to the final specifications of the operating plant.	managed in consultation with the LPA, and the process will be reviewed annually. Further details are to be confirmed in the detailed OEMP(s).

4.9 Air Quality

Table 4.8: National Grid Substation and Grid Connection Infrastructure, Air Quality

Potential Impact	Mitigation/Enhancement Measure	Monitoring Requirements
Back-up generator emissions.	Ensure the back-up generators adhere to Stage V emissions standards and seek alternatives where practicable, such as batteries or alternative fuel.	The overall responsibility will be with NGET.
Vehicle emissions from the operational maintenance activities required during operation of Scheme	Vehicles will be correctly maintained and operated in accordance with manufacturer's recommendations and in a responsible manner. All plant and vehicles will be required to switch off their engines when not in use and when it is safe to do so. In addition, plant and vehicles will conform to relevant applicable standards for the vehicle type as follows: • Euro 4 (Oxides of Nitrogen (NOx)) for petrol cars, vans and minibuses; • Euro 6 (NOx and PM) for diesel cars, vans and minibuses; and • Euro VI (NOx and PM) for lorries, buses, coaches and Heavy Goods Vehicles (excluding specialist abnormal indivisible loads).	The overall responsibility will be with NGET. Specific responsibilities will be confirmed in the detailed OEMP.

4.10 Socio-Economics

Table 4.9: National Grid Substation and Grid Connection Infrastructure, Socio-Economics

Potential Impact	Mitigation/Enhancement Measure	Monitoring Requirements
Visual impact on tourism and recreation facilities	The embedded visual mitigation includes designing the preliminary layout of the Site to provide suitable buffers from roads, PRoW, and neighbouring tourism destinations. These buffers, along with minimal on-site activity during general operation, help to mitigate impacts on the durability of tourism receptors during the National Grid Substation's operational lifetime. Furthermore, proposed landscaping planting is likely to mature over the lifetime of the Scheme, which will mitigate effects of the Scheme on the surrounding landscape and amenity for residents and tourists. Measures to mitigate visual impacts are set out in the **Outline LEMP [EN0110014/APP/7.4].** These mitigation measures, such as noise attenuation, glint and glare mitigation, and additional landscape screening to residential and other sensitive receptors will help to reduce overall impacts on tourism and recreational receptors such as tourist attractions and recreational routes in the proximity of the Scheme. General operational and maintenance traffic will be directed to using access and travel routes most appropriate for the vehicle type required.	To be confirmed in the detailed **OEMP(s).** To be confirmed in the detailed **LEMP.**
Disruption to users of PRoW during operation **Disruption to users of PRoW during peak operational**	Any diversions to PRoW and other recreational routes, if required during infrastructure replacement activities events, will be temporary with original routing restored as soon as practicable, appropriately signed, managed and the duration and length of diversions will be optimised to minimise impacts on accessibility and use. An **Outline PRoWPPMP [EN0110014/APP/7.8]** outlines these measures.	To be confirmed in the detailed **OEMP(s).** To be confirmed in the detailed **PRoWPPMP**.

Potential Impact	Mitigation/Enhancement Measure	Monitoring Requirements
and maintenance periods		

4.11 Soils and Agriculture

Table 4.10: National Grid Substation and Grid Connection Infrastructure, Soils and Agriculture

Potential Impact	Mitigation/Enhancement Measure	Monitoring Requirements
Potential for surface soil compaction and disturbance in some areas due to maintenance work. For example, grassed access alleys traversed by light vehicles for Site maintenance could cause surface compaction in damp or wet soil conditions.	A **Soil Resource and Management Plan (SRMP)** will detail how the risk of causing surface compaction can be minimised and how to remove compaction if it has occurred. Examples include specification of vehicles used for any trafficking off access tracks, minimising travel over the land in vehicles when ground conditions are wet, placement and movement of any livestock troughs and site inspection by a suitably experienced soil scientist to monitor for the emergence of any soil compaction issues.	Soil assessments and monitoring will be undertaken as detailed in the SRMP.

4.12 Human Health

Table 4.11: National Grid Substation and Grid Connection Infrastructure, Human Health

Potential Impact	Mitigation/Enhancement Measure	Monitoring Requirements
None relevant to the National Grid Substation or Grid Connection Infrastructure.	N/A	N/A

4.13 Ground Conditions

Table 4.12: National Grid Substation and Grid Connection Infrastructure, Ground Conditions

Potential Impact	Mitigation/Enhancement Measure	Monitoring Requirements
The discovery of ground contamination during groundworks	Embedded measures included at the Construction Phase will continue to provide mitigation during the Operational Phase, e.g., avoidance of a potential hazard as part of the design of the Scheme means that the hazard will not be encountered during operation.	The Environmental Manager would regularly record compliance in a log book. The detailed OEMP(s) would detail the frequency.

4.14 Minerals

Table 4.13: National Grid Substation and Grid Connection Infrastructure, Minerals

Potential Impact	Mitigation/Enhancement Measure	Monitoring Requirements
As a result of the nature of the Scheme, no mitigation measures have been identified during the operation and maintenance phase of the Scheme for Minerals.	N/A	N/A

4.15 Materials and Waste

Table 4.14: National Grid Substation and Grid Connection Infrastructure, Materials and Waste

Potential Impact	Mitigation/Enhancement Measure	Monitoring Requirements
Impacts of waste to the surrounding environment. **Potential to impact on sensitive receptors (humans, wildlife, and controlled waters) if not stored and managed appropriately.** **Impacts on waste recycling and handling facility capacity.**	During the operation and maintenance phase, the Scheme will adhere to the waste hierarchy by prioritising waste prevention, followed by the reuse, recycling, and recovery of equipment during the replacement of components. Landfill disposal will be considered only as a last resort. A Site Waste Management Plan will be developed for the operation and maintenance phase of the Scheme to ensure operational waste is managed suitably, and that waste arisings are sent for handling at facilities within the waste local authorities that have capacity to do so, without adversely impacting upon their capacity to handle waste arisings for all other waste streams in the authority area. All waste management will comply with relevant regulations, and waste will be transported by licensed hauliers to authorised waste management sites with the necessary permits for the consigned wastes. The Scheme is expected to generate WEEE during both the Operational Phase, and during the Decommissioning Phase. These items will be recovered and recycled by an authorised reprocessor in compliance with the WEEE Regulations 2013 (Ref 18-58). To ensure this is done according to 'Best Available Treatment Recovery and Recycling Techniques', a list of up-to-date authorised reprocessors should be established prior to the Operational Phase of the Scheme and kept up-to-date throughout the Operational Phase and Decommissioning.	A register of all waste loads leaving the Order limits would be maintained to provide a suitable audit trail for compliance purposes and to facilitate monitoring and reporting of waste types, quantities and management methods.

Potential Impact	Mitigation/Enhancement Measure	Monitoring Requirements
	Excavated material reuse would be determined via the Site Waste Management Plan in accordance with the Definition of Waste: Development Industry Code of Practice (DoW CoP) exemption or environmental permit. Materials requiring removal from the Order limits during operation would be transported using licensed carriers and records kept, detailing the types and quantities of waste moved and the destinations of this waste, in accordance with the relevant regulations. Where significant cumulative effects on hazardous waste handling facilities from the replacement works of multiple Nationally Significant Infrastructure Projects are assessed as likely to occur, a coordinated approach between site operators of those relevant Nationally Significant Infrastructure Projects should be secured ahead of the commencement of replacement activities. This should include measures, as necessary, to stagger replacement works across Nationally Significant Infrastructure Projects, staggering the delivery of hazardous waste arisings requiring treatment to relevant facilities, and securing suitable and safe hazardous waste storage if required to delay delivery to hazardous waste treatment facilities, to reduce overloading of hazardous waste facilities.	

4.16 Telecommunications, Television Reception and Utilities

Table 4.15: National Grid Substation and Grid Connection Infrastructure, Telecommunications, Television Reception and Utilities

Potential Impact	Mitigation/Enhancement Measure	Monitoring Requirements
Utilities, Telecommunications and Television Receptors	During the operational and maintenance phase, there will be safe working beneath any overhead lines in line with National Grid's technical guidance note 287 (Ref 1-7), including, for example, ensuring adequate clearances are in place when plant and equipment are being moved beneath overhead lines, and limiting any planting beneath overhead lines to low growing species. Measures in relation to safe working near buried utilities, particularly gas pipelines, will be in place at all phases of the Scheme. For example, safety measures set out in National Grid and Northern Gas Networks guidance documents for third parties working in the vicinity of high pressure gas pipelines and associated installations (Ref 1-8, Ref 1-9) and the HS(G)47 guidance (Ref 1-10).	No monitoring required.

4.17 Glint and Glare

Table 4.16: National Grid Substation and Grid Connection Infrastructure, Glint and Glare

Potential Impact	Mitigation/Enhancement Measure	Monitoring Requirements
None relevant to the National Grid Substation or Grid Connection Infrastructure.	N/A	N/A

4.18 Electromagnetic Fields

Table 4.17: National Grid Substation and Grid Connection Infrastructure, Electromagnetic Fields

Potential Impact	Mitigation/Enhancement Measure	Monitoring Requirements
Potential for risks to human health associated with electromagnetic fields.	The following embedded mitigation measures have been incorporated into the Scheme design: • For overhead lines, a setback distance of at least 15m from the existing 400kV overhead cables is to be maintained between the overhead cables, and receptors pertaining to human health; based on the distance at which the electrical field strength for a 400kV overhead cable is below the threshold value of 5kV m-1. • The majority of cables installed at the site will be underground cables. This is material as underground cables significantly reduce the risk of significant EMF impacts upon human health; • For overhead lines, a setback distance of at least 15m from the existing 400kV overhead cables is to be maintained between the overhead cables, and receptors pertaining to human health; • All proposed cables and associated electrical infrastructure will be 'UKCA' and/or 'CE' marked; and • The mitigation measures, such as the electrical infrastructure and depth of underground cables is outlined in the **Design Principles, Parameters and Commitments [EN0110014/APP/7.18].**	The Environmental Manager will regularly record compliance in a logbook.

4.19 Major Accident and Disasters

Table 4.18: National Grid Substation and Grid Connection Infrastructure, Major Accidents and Disasters

Potential Impact	Mitigation/Enhancement Measure	Monitoring Requirements
Major Accident or Disasters.	The following embedded mitigation measures have been incorporated into the Scheme design: • The Scheme has been designed to incorporate adequate separation between infrastructure and sensitive receptors; and • The Scheme layout seeks to avoid greatest areas of flood risk and avoids existing utilities to reduce risk of damage or severance. All works will be undertaken in accordance with relevant Health and Safety legislation and guidance. Details of fire, police, emergency services and hospitals will be publicised and included in the site induction. Security measures will be in place throughout the phases of the scheme, reducing the likelihood of crime and terrorism. This includes motion sensing security lighting, perimeter fencing, and CCTV. An appropriate risk assessment will be produced prior to construction to minimise the risk of major accidents during operation. An Emergency Response Plan would be followed in the event of fire. Further risks of major accidents and disasters are covered in the other tables in this document relating to Hydrology, Flood Risk and Drainage; Transport and Access; Ground Conditions, Human Health and Other Environmental Matters (Utilities and Glint and Glare).	No monitoring required.

5 Complementary Plans and Procedures

5.1.1 A suite of complementary environmental plans and procedures for the operation and maintenance phase will be developed alongside the detailed OEMP/have been included within the DCO application, as described above, and set out proposed mitigation for the operation and maintenance phase, and further detailed plans will be prepared for further approval.

6 Implementation and Operation

6.1.1 Each detailed OEMP will set out all roles, responsibilities and actions required in respect of implementation of the measures described in this Outline OEMP, including:

- An organogram showing team roles, names, and responsibilities;
- Training requirements for relevant personnel on environmental topics;
- Information via on-site briefings and toolbox talks that will be used to equip relevant staff with the necessary level of knowledge to follow environmental control procedures;
- Measures to advise employees of changing circumstances;
- Communication methods;
- Document control;
- Monitoring, inspections, and audits of site operations; and
- Environmental emergency procedures.

7 Monitoring and Reporting

7.1 Monitoring

7.1.1 Monitoring and reporting will be undertaken for the duration of the operation and maintenance phase to demonstrate the effectiveness of the measures set out in the detailed OEMP and related construction controls and allow for corrective action to be taken where necessary.

7.1.2 As part of the monitoring process a designated Environmental Manager will observe site activities and report any deviations from the detailed OEMP in a logbook, along with the action taken and general conditions at the time. In addition, the Environmental Manager will conduct regular walkover surveys which will be documented and arrange regular formal inspections to ensure the requirements of the detailed OEMP are being met.

7.1.3 The Environmental Manager would also act as day-to-day contact with relevant local authorities and other regulatory agencies, such as the Environment Agency.

7.2 Records

7.2.1 The Environmental Manager will retain records of environmental monitoring and implementation of the detailed OEMP. This will allow provision of evidence that the detailed OEMP are being implemented effectively. These records will include:

- Results of routine site inspections by Environmental Manager/ Project Manager;
- Environmental surveys and investigations;
- Environmental Action Schedule;
- Environmental equipment test records;
- Licences and approvals; and
- Corrective actions taken in response to incidents, breaches of the approved detailed OEMP or complaints received from a third party.

7.2.2 The detailed OEMP will be updated if it is necessary to add additional control measures, with a full review as required. Existing control measures and mitigation will not be amended without prior agreement with the local authorities.

8 References

Ref 1-1 UK Government (2008) *Planning Act 2008.* < Planning Act 2008 >

Ref 1-2 UK Government (2017) *The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017*. < The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 > accessed December 2025.

Ref 1-3 Building Research Establishment (BRE) (2016) *Digest 365: Soakaway Design and Sewers for Adoption.* < Soakaway design (DG 365 - 2016) DOWNLOAD > accessed December 2025.

Ref 1-4 Regulation (EU) 2016/1628 of the European Parliament (2026) *Requirements relating to gaseous and particulate pollutant emission limits and type-approval for internal combustion engines for non-road mobile machinery*. < Regulation - 2016/1628 - EN - EUR-Lex > accessed December 2025.

Ref 1-5 UK Government (2018) *The Non-Road Mobile Machinery (Type Approval and Emission of Gaseous and Particulate Pollutants) Regulations 2018.* < The Non-Road Mobile Machinery (Type-Approval and Emission of Gaseous and Particulate Pollutants) Regulations 2018 > accessed December 2025.

Ref 1-6 UK Government (2013) *The Waste Electrical and Electronic Equipment (WEEE) Regulations 2013.* < Regulations: Waste Electrical and Electronic Equipment (WEEE) - GOV.UK > accessed December 2025.

Ref 1-7 National Grid (2016) *Technical Guidance Note 287: Third-party guidance for working near National Grid Electricity Transmission equipment.*

Ref 1-8 National Grid (2007) *Specifications for Safe Working in the Vicinity of National Grid High Pressure Gas Pipelines and Associated Installations – Requirements for Third Parties*. < 1080_April 24_DM_A5 Safe Working Booklet - 23.04.2024 > accessed December 2025.

Ref 1-9 Northern Gas Networks (2017) *Working safety near high pressure gas pipelines and associated installations: Third party requirements*. < Working-safely-near-high-pressure-gas-pipelines-and-associated-installations.pdf > accessed December 2025.

Ref 1-10 Health and Safety Executive (HSE) (2014) *Avoiding danger from underground services HSG47 guidance*.

Ref 1-11 International Commission on the Non-Ionizing Radiation Protection (ICNIRP) (1998) *ICNIRP Guidelines: for limiting exposure to time-varying electric, magnetic and electromagnetic fields (up to 300 GHZ) guidelines*. < https://www.icnirp.org/cms/upload/publications/ICNIRPemfgdl.pdf > accessed December 2025.

Appendix A Preliminary Surface Water Drainage Maintenance Schedule

East Pye Solar

Outline Operational Environmental Management Plan

Appendix A: Preliminary Surface Water Drainage Maintenance Schedule

Revision 2

October 2026

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1 Introduction

1.1.1 This Preliminary Surface Water Drainage Maintenance Schedule has been prepared to outline initial details of the likely maintenance activities and frequency for the surface water drainage systems for East Pye Solar (hereafter referred to as 'the Scheme').

1.1.2 A Development Consent Order (DCO) would provide the necessary authorisations and consents for the Scheme which comprises the construction, operation and maintenance, and decommissioning of a solar photovoltaic (PV) electricity generating facility with a proposed total capacity of over 100 megawatts (MW), and associated development comprising a Battery Energy Storage System (BESS), up to three 132 kV Project Substations and up to three 400kV Project Substations, a Cable Route Corridor, Grid Connection Infrastructure and a new National Grid Substation. A description of the Scheme can be found **in Environmental Statement (ES): Chapter 4 – The Scheme [EN0110014/APP/6.1.4]**.

1.1.3 This document forms Appendix A of the **Outline Operational Environmental Management Plan (OEMP) [EN0110014/APP/7.2]**.

1.1.4 The surface water drainage system details for the Scheme as assessed and set out in **ES Appendix 9.1 Flood Risk Assessment (FRA) [EN0110014/APP/6.3.9.1]** contains the following components:

- Battery Energy Storage System (BESS), Project and National Grid Substations: Permeable aggregate surface with underlying sub-base lined with an impermeable membrane, with associated inspection chambers and downstream flow control manhole. An auto shut-off penstock valve will be included for the BESS (and on Substations where required) for firewater runoff pollution management;

- Standalone and Integrated inverter units (as defined by Work Plan 1 within the **Design Principles, Parameters and Commitments [EN0110014/APP/7.18]**): Filter drain or permeable aggregate surface with underlying sub-base, with appropriate overflow outlet included as required;

- Field and connecting internal access tracks (outside of compounds): hardcore/gravel surface with swale or filter drain running parallel with or downhill of the track.

1.1.5 The different elements of the drainage system require regular inspection and maintenance to ensure that they continue to operate as designed, both in terms of hydraulic capacity and potential pollutant removal.

1.1.6 This report sets out the inspection and maintenance requirements for long term management of the development's surface water drainage system in

accordance with The SuDS Manual, CIRIA C753[1], and identifies the various bodies responsible for ownership and maintenance of different elements of the system.

2 Operation and Maintenance

2.1 Health and Safety

2.1.1 All those responsible for the maintenance operations will adhere to the relevant health and safety legislation for the activities listed within this report (including lone working, if relevant). Method statements and risk assessments will always be completed prior to the undertaking of any works.

2.2 Maintenance Body

2.2.1 The overall responsibility for the maintenance regime will be with the Scheme operator. Specific responsibilities will be confirmed in detailed Operational Environmental Management Plans (OEMP(s)).

2.2.2 The National Grid Substation will remain beyond the lifetime of the wider Scheme and the associated surface water drainage system (including connecting access track from Station Road) will be maintained by National Grid.

2.3 Maintenance Overview

2.3.1 Maintenance refers to the inspections required to identify performance issues and plan maintenance as required, operation and maintenance of the drainage system, landscape management and waste management associated with contaminated silt and other waste materials resulting from maintenance.

2.3.2 CIRIA C753 The SuDS Manual[1] provides information in Chapter 32 for the operation and maintenance of SuDS. The maintenance activities are broadly defined as regular, occasional and remedial maintenance. It is noted that some scenarios may require one-off maintenance activities.

2.3.3 The SuDS Manual defines maintenance as:

- Regular Maintenance: consists of basic tasks carried out to a frequent and predictable schedule, including inspections/monitoring, silt or oil removal if required more frequently than once a year, vegetation management, sweeping or surfaces and litter / debris removal;

1 Construction Industry Research and Information Association. (2015). The SUDS Manual V.6, C753. [Online]. Available at: https://www.ciria.org/CIRIA/News/CIRIA_news2/CIRIA_publishes_new_guidance_on_SuDS_construction.aspx. Accessed November 2024

- Occasional Maintenance: comprises tasks that are likely to be required periodically, but on a much less frequent and predictable basis than the regular tasks;
- Remedial Maintenance: describes the intermittent tasks that may be required to rectify faults associated with the system, although the likelihood of faults can be minimised with good design, constructions and regular maintenance activities.

2.3.4 Maintenance regimes are to be reviewed on a regular basis to ensure that the approach adopted is meeting its objectives.

2.3.5 **Table 2.1** provides an extract from The SuDS Manual Table 32.1 and defines the type of maintenance required by each of the drainage components of the Scheme. Further details outlining the anticipated frequency of specific maintenance works that should be undertaken are provided in **Sections 2.4-2.6**.

Table 2.1: Typical Key Drainage Components Operation & Maintenance Activities

O&M Activity	Drainage Component		
	Manholes/Flow Control Refer to Section 2.4)	Permeable Surface/Filter Drain (Refer to Section 2.5)	Swale (Refer to Section 2.6)
Regular Maintenance			
Inspection	■	■	■
Litter/debris removal	■	■	■
Grass cutting		■	■
Weed/invasive plant control		■	■
Shrub management			■
Occasional Maintenance			
Sediment management	■	■	■
Vegetation/plant replacement			■
Vacuum sweeping and brushing		■	

O&M Activity	Drainage Component		
	Manholes/Flow Control Refer to Section 2.4)	Permeable Surface/Filter Drain (Refer to Section 2.5)	Swale (Refer to Section 2.6)
Remedial Maintenance			
Structure rehabilitation/repair	■	■	■
Infiltration surface conditioning		■	■

2.4 Manholes, Flow Controls & Penstock Valves

2.4.1 A flow control will serve the BESS and Substation compounds. The form of this flow control will be confirmed at the detailed design stage. The flow control will be located downstream of aggregate permeable surfaces with a lined sub-base and as such the risk of blockage/sediment build up is therefore considered to be very low.

2.4.2 Where the proposed surface water drainage arrangements at detailed design are altered to that outlined above and the risk of blockage increases, appropriate measures including a lever at surface level or overflow weir inside the chamber will be considered to manage residual risk of blockage.

2.4.3 It is recommended that manholes (and associated pipe work) and flow control chambers are inspected and cleared of silt at a minimum of a bi-annual frequency and after prolonged periods of heavy rainfall to check condition/performance.

2.4.4 Penstock auto shut-off valve will be located upstream of the flow control manhole for the BESS and where required Substation compounds. They will be inspected quarterly, or otherwise agreed with the local planning authority, to test and maintain performance (both auto-shut off and manual options).

2.5 Permeable Surface/Filter Drain

2.5.1 The principal requirements related to permeable pavements and filter drains involve surface cleaning at least three times a year. Additionally, litter and vegetation should be removed on a regular basis with vegetation replacement on surface of field/connecting access track filter drains as required.

2.5.2 Note that the use of grit and salt may adversely affect the treatment and drainage potential of permeable surfaces, and the use of weed killers can disrupt the biological breakdown of contaminants that would otherwise occur

in the sub-base. A summary of required maintenance activities is shown in **Table 2.2** (extracts from CIRIA SuDS Manual Table 16.1 and Table 20.15).

Table 2.2: Permeable Pavement/Filter Drain Operation & Maintenance Requirements

Maintenance Schedule	Required Action	Frequency
Regular Maintenance	Brushing and vacuuming. Care should be taken in adjusting vacuuming equipment to avoid removal of jointing material if present. Any lost material will be replaced.	Three times / year – at end of winter, mid-summer after autumn leaf fall, or as required based on site-specific observations of clogging or manufacturers' recommendations
	Remove litter and debris from filter drain surface, access chambers and pre-treatment devices	Monthly or as required
	Inspect pre-treatment systems, inlets and perforated pipework and control systems for blockages	Monthly
	Remove sediment from pre-treatment devices	Bi-annually
Occasional Maintenance	Stabilise and mow contributing and adjacent areas.	As required
	Removal of weed.	As required
	Clear filter drain perforated pipework of blockages	As required
	Remove or control tree roots	As required
Remedial Maintenance	Remediate and landscaping which, through vegetation maintenance or soil strip, has been raised to within 50mm of the level of the paving.	As required
	Remedial work to any depressions, rutting and cracked or broken blocks considered detrimental to the structured performance or a hazard to users.	As required

Maintenance Schedule	Required Action	Frequency
	Rehabilitation of surface and upper structure.	As required (if filtration performance is reduced as a result of significant clogging)
Monitoring	Initial inspection.	Monthly for three months after installation
	Inspect for evidence of poor operation and / or weed growth. If required take remedial action.	Three-monthly, forty-eight hours after large rainfall events
	Inspect silt accumulation rates and establish appropriate brushing frequencies.	Annually
	Monitor inspection chambers.	Annually

2.5.3 The aggregate drainage system of the BESS may be split into 'compartments' for battery units, each with their own associated lined aggregate sub-base area and separated by lengths of access track. This would aid in the isolation and testing of surface water runoff, and remediation of affected areas in the event of a fire incident.

2.6 Swales

2.6.1 The principal requirements related to swales involve the maintenance of the vegetation/grass surface and inspection of inlets and outlets for blockages.

2.6.2 A summary of required maintenance activities is shown in **Table 2.3** (extracts from CIRIA SuDS Manual Table 17.1).

Table 2.3: Swale Operation & Maintenance Requirements

Maintenance Schedule	Required Action	Frequency
Regular Maintenance	Remove litter and debris	Monthly, or as required
	Cut grass – to retain grass height within specified design range	Monthly (during growing season), or as required
	Manage other vegetation and remove nuisance plants	Monthly at start, then as required
	Inspect inlets, outlets and overflows for blockages, and clear if required	Monthly

Maintenance Schedule	Required Action	Frequency
	Inspect infiltration surfaces for ponding, compaction, silt accumulation, record areas where water is ponding >48 hours	Monthly, or when required
	Inspect vegetation coverage	Monthly for 6 months, quarterly for 2 years, then bi-annually
	Inspect inlets and facility surface for silt accumulation, establish appropriate silt removal frequencies	Bi-annually
Occasional Maintenance	Reseed areas of poor vegetation growth, alter plant types to better suit conditions, if required.	As required if bare soil exposed over 10% or more of the swale treatment area
Remedial Maintenance	Repair erosion or other damage by re-turfing or reseeding	As required
	Relevel uneven surfaces and reinstate design levels	As required
	Scarify and spike topsoil layer to improve infiltration performance, break up silt deposits and prevent compaction of the soil surface	As required
	Remove build-up of sediment on upstream gravel trench, flow spreader or at top of filter strip	As required
	Remove and dispose of oils or petrol residues using safe standard practices	As required

2.7 Access for Maintenance

2.7.1 The drainage features serving the access tracks will be accessible via the tracks themselves.

2.7.2 The drainage systems for the BESS, National Grid and Project Substations will be accessed via the internal access tracks within the vicinity and the compounds themselves.