



WHITESTONE
solar farm

WHITESTONE SOLAR FARM

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OUTLINE OPERATIONAL ENVIRONMENTAL MANAGEMENT PLAN

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Prepared by:

ERM

Prepared for:

Whitestone Net Zero Ltd

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Glossary

| Term | Meaning |
|-----------------------------------|---|
| <i>The Applicant</i> | Whitestone Net Zero Ltd. |
| <i>The Application</i> | The Application to be submitted to the Secretary of State for a Development Consent Order. |
| <i>Cable Corridors</i> | Corridors within which the high voltage cables would be constructed. |
| <i>Environment Statement (ES)</i> | The Environmental Statement which presents the environmental information relating to the Proposed Development. The ES has been prepared to present information for formal consultation in accordance with current EIA regulation. |
| <i>Long Lane 400kV Substation</i> | The new 400 kilovolt substation proposed on land immediately east of Long Lane, Brinsworth, S60 4JJ. |
| <i>Order Limits</i> | Maximum extent of the Proposed Development comprising the Site and Cable Corridors. |
| <i>The Proposed Development</i> | The proposed Whitestone Solar Farm. |
| <i>The Site</i> | The land planned to be used for solar PV array and associated infrastructure, BESS, substation, landscaping and habitat enhancement. The Site is split into W1, W2, and W3. |
| <i>Solar PV Infrastructure</i> | Solar PV arrays and supporting infrastructure. |
| <i>Whitestone 1 (W1)</i> | The northern parcels of the Whitestone Solar Farm. |
| <i>Whitestone 2 (W2)</i> | The middle parcels of the Whitestone Solar Farm. |
| <i>Whitestone 3 (W3)</i> | The southern parcels of the Whitestone Solar Farm. |

Acronyms

| Acronym | Meaning |
|---------|---|
| AGL | Above Ground Level |
| BESS | Battery Energy Storage System |
| BMV | Best and Most Versatile |
| CDC | City of Doncaster Council |
| CCTV | Closed-Circuit Television |
| DCC | Derbyshire County Council |
| DCO | Development Consent Order |
| EIA | Environmental Impact Assessment |
| ERM | Environmental Resources Management |
| ES | Environmental Statement |
| LEMP | Landscape and Ecology Management Plan |
| LGV | Light Goods Vehicle |
| LPA | Local Planning Authority |
| NEDDC | North East Derbyshire District Council |
| NGR | National Grid Reference |
| oBSMP | Outline Battery Safety Management Plan |
| oCEMP | Outline Construction Environmental Management Plan |
| oLEMP | Outline Landscape and Ecology Management Plan |
| OEMP | Operational Environmental Management Plan |
| oOEMP | Outline Operational Environmental Management Plan |
| oSWMP | Outline Site Waste Management Plan |
| oSWDS | Outline Surface Water Drainage Strategy |
| SWDS | Surface Water Drainage Strategy |
| PPG | Pollution Prevention Guidance |
| PRoW | Public Rights of Way |
| PV | Photovoltaic |
| RACIM | Responsible, Accountable, Consulted, Informed and Monitor |
| RMBC | Rotherham Metropolitan Borough Council |
| SMP | Soil Management Plan |
| SWMP | Site Waste Management Plan |
| W1 | Whitestone 1 |
| W2 | Whitestone 2 |
| W3 | Whitestone 3 |

Units

| Units | Meaning |
|-----------|--------------|
| <i>ha</i> | Hectare(s) |
| <i>km</i> | Kilometre(s) |
| <i>m</i> | Metre(s) |
| <i>MW</i> | Megawatt(s) |

1 OUTLINE OPERATIONAL ENVIRONMENTAL MANAGEMENT PLAN

1.1 Introduction

Background

- 1.1.1 An Outline Operational Environmental Management Plan (oOEMP) has been prepared by Environmental Resources Management Ltd (ERM) on behalf of Whitestone Net Zero Ltd (the Applicant) for the Whitestone Solar Farm project (the Proposed Development).
- 1.1.2 The Proposed Development is located to the east of Sheffield, South Yorkshire, within the administrative areas of the City of Doncaster Council (CDC), North East Derbyshire District Council (NEDDC), Derbyshire County Council (DCC) and Rotherham Metropolitan Borough Council (RMBC). The Site and Cable Corridors represent the current maximum extent of land that is expected to be included, together forming the Order Limits within the Application.
- 1.1.3 The Order Limits comprise a total area of approximately 1,488 hectares (ha), consisting of approximately 339ha proposed for Cable Corridors, and 1,149ha proposed for solar and associated infrastructure, and landscape mitigation and habitat enhancement ('the Site'). The Order Limits are centred around National Grid Reference (NGR) SK 485887. At the maximum extent, the Order Limits extend approximately 18.5km in a north-south direction, and approximately 8km in an east-west direction.
- 1.1.4 Due to the scale of the Proposed Development, and the distance between areas of the Site, for the purpose of Environmental Impact Assessment (EIA), the Site has been split into three distinct areas. These areas are shown in **ES Volume 3, Figure 3.2: Site Referencing [EN0110020/APP/6.19]** and referred to as:
- Whitestone 1 (W1)
 - Whitestone 2 (W2); and
 - Whitestone 3 (W3).
- 1.1.5 The Proposed Development involves the construction, operation (including maintenance), and decommissioning of over 100 MW of solar photovoltaic (PV) array, Battery Energy Storage System (BESS), onsite substations and supporting infrastructure, and grid connection infrastructure.
- 1.1.6 The Proposed Development will connect to the new National Grid substation at Brinsworth (Long Lane 400kV Substation), located east of Long Lane, Rotherham. National Grid has applied to RMBC for the development of this new substation which is intended by National Grid to be operational in time for the Proposed Development to connect in 2029. The Long Lane 400kV

substation is not included in the Proposed Development and is subject to a separate planning application taken forward by National Grid.

1.1.7 The Proposed Development comprises:

- Solar PV Infrastructure
- Interconnection Cables
- BESS
- Substations
- Highway Works
- Landscaping and biodiversity mitigation / enhancement
- Drainage Works
- Temporary Construction Compounds; and
- Other Works (access tracks, security, lighting, and Glint and Glare fencing).

1.1.8 The purpose of the oOEMP is to outline the overarching details and principles that will be applied to manage and mitigate the environmental impacts of the operation and maintenance phase of the Proposed Development.

1.1.9 The oOEMP will be the basis for the Operational Environmental Management Plan (OEMP), which is secured by a requirement in Schedule 2 to the **draft Development Consent Order (DCO) [EN0110020/APP/3.1]**,

1.1.10 The oOEMP does not address construction or decommissioning activities, which are subject to separate environmental management plans: **Outline Construction Environmental Management Plan [EN0110020/APP/5.9]** and **Outline Decommissioning Environmental Management [EN0110020/APP/5.11]** submitted in the Application.

1.1.11 The measures set out in this oOEMP are based on industry standards and best practice at the time of writing, driven by international and national legislation as well as national and local policy. In-line with this, the measures proposed are intended to be proportionate to the potential effect on environmental receptors with commensurately more robust measures proposed where greater effects are likely to occur.

Complementary Plans and Procedures

1.1.12 Other environmental management plans submitted with this ES are listed below:

- **Outline Construction Environmental Management Plan [EN0110020/APP/5.9]**, including:
 - Outline Site Waste Management Plan
 - Outline Dust Management Plan
 - Outline Soil Management Plan
 - Outline Excavated Materials Management Plan
 - Outline Incident Response Plan

- **Outline Decommissioning Environmental Management Plan [EN0110020/APP/5.11]**
- **Outline Construction Traffic Management Plan [EN0110020/APP/5.12]**
- **Outline Landscape and Ecological Management Plan [EN0110020/APP/5.13]**
- **Outline Public Rights of Way Management Plan [EN0110020/APP/5.14]**
- **Outline Battery Safety Management Plan [EN0110020/APP/5.15]**
- **Outline Written Scheme of Investigation [EN0110020/APP/5.16]**
- **Outline Surface Water Drainage Strategy [EN0110020/APP/5.17]; and**
- **Outline Cable Construction Method Statement [EN0110020/APP/5.19].**

1.2 Aims and Objectives

- 1.2.1 The oOEMP is intended to demonstrate the measures that will be applied during the operation and maintenance phase of the Proposed Development to adequately protect environmental resources. Detailed proposals for such measures will be documented within the Operational Environmental Management Plan (OEMP), which will be prepared prior to the commencement of operation and will be substantially in accordance with this oOEMP. The measures set out are proportionate to the level of risk, and where greater risks are identified during the operation and maintenance phase, additional or enhanced measures will be implemented as appropriate.
- 1.2.2 The approach set out in this oOEMP establishes the framework that will inform the preparation of the OEMP, setting out how environmental measures for the management of operational and maintenance activities will be implemented as part of the Proposed Development.

Objectives

- 1.2.3 The objectives of the oOEMP are to:
- Provide a clear and auditable framework for the management of operational and maintenance activities, ensuring the effective implementation of environmental mitigation measures identified through the Environmental Impact Assessment (EIA) process
 - Ensure that operational and maintenance activities are undertaken in compliance with relevant legislation, the requirements of the **draft DCO [EN0110020/APP/3.1]**, and the commitments and mitigation measures set out in the Environmental Statement (ES)
 - Define the environmental management measures, procedures and controls that will be applied during the operation and maintenance phase to avoid, reduce or manage potential adverse environmental effects
 - Establish clear roles and responsibilities for environmental management during the operational phase, including arrangements for monitoring,

reporting and responding to environmental incidents or non-compliance;
and

- Provide a mechanism through which site-specific and detailed operational controls can be developed and applied, informed by final design, operational requirements and site conditions.

Review Process

- 1.2.4 The OEMP will be prepared prior to the commencement of the operational phase and submitted for approval to the relevant local planning authorities (LPAs) for approval, in accordance with a requirement in Schedule 2 to the **draft DCO [EN0110020/APP/3.1]**.
- 1.2.5 The OEMP will operate as a live document throughout the operation and maintenance phase and will be reviewed and updated as necessary to reflect operational experience, site conditions, monitoring outcomes, and any approved changes to operational activities. Any material amendments to the approved OEMP will be subject to approval by the relevant Local Planning Authorities, where required, prior to implementation.
- 1.2.6 The Site Manager (or appointed management contractor) will be responsible for implementing the approved OEMP and for maintaining appropriate records to demonstrate compliance with its requirements. The Applicant will be kept informed of any material environmental issues or potential non-compliances arising during operation in order to monitor overall compliance pursuant to a requirement in Schedule 2 to the **draft DCO [EN0110020/APP/3.1]**.
- 1.2.7 A copy of the approved OEMP and associated records will be retained by the Site Operator for the duration of the operational phase and will be made available for inspection as required. Records will be retained in accordance with relevant regulatory guidance.

1.3 Outline Operational Environmental Management

Introduction

- 1.3.1 This section sets out the general Site arrangements for the operational phase of the Proposed Development.

Operational Activities

- 1.3.2 During the operational phase, activity within the Proposed Development will be minimal and will be restricted principally to vegetation management and grazing, equipment maintenance and servicing, replacement and renewal of any components that fail, and monitoring and inspection. It is anticipated that maintenance and servicing would include the inspection, removal, reconstruction, refurbishment or replacement of faulty or broken equipment to ensure the continued effective operation of the Proposed Development. Along the Cable Corridors, operational activity will consist of routine

inspections (schedule to be determined) and any reactive maintenance such as where a cable has been damaged.

Roles and Responsibilities

- 1.3.3 Key roles during the operation and maintenance phase in managing environmental impacts will likely include, but are not limited to:
- Site Manager - Responsible for the overall coordination of onsite activities during operation and maintenance. The Site Manager will oversee maintenance works, ensuring that activities are undertaken safely and in accordance with the OEMP, DCO, and relevant legislation
 - Environment Manager - Responsible for the management of all environmental aspects onsite, ensuring compliance with environmental legislation, good practice, and the mitigation and monitoring measures set out in the ES and OEMP. The Environment Manager will oversee environmental monitoring, undertake regular inspections, and report or respond to any incidents or non-compliances. The role will also include liaising with environmental bodies and other relevant third parties where required; and
 - Health and Safety Manager - Responsible for monitoring and controlling compliance with health and safety legislation, standards, and site-specific requirements. This includes overseeing safe systems of work, conducting inspections, and ensuring corrective actions are implemented.
- 1.3.4 The roles and their respective responsibilities for different tasks will be listed in the OEMP, including a Responsible, Accountable, Consulted, Informed and Monitor (RACIM) matrix.

Operational Programme

- 1.3.5 The Proposed Development will operate for a period of 60 years, after which it will be decommissioned, as described in **ES Chapter 5: The Proposed Development [EN0110020/APP/6.5]**. During the operation and maintenance phase, activities will likely be limited to routine inspection, monitoring, maintenance, landscape and ecological management, and the replacement of components where required.
- 1.3.6 The Site will be monitored on a 24-hour basis, with on site presence generally limited to short duration visits for inspection, maintenance and monitoring activities. These activities are anticipated to occur between 0800-1800 Monday to Friday, where practicable. Nighttime or weekend working (including public and bank holidays) is not routinely anticipated during operation; however, it may be required on an infrequent basis for emergency repairs, maintenance activities, or panel cleaning, where necessary.

Control of Light

- 1.3.7 No permanent operational lighting will be installed within the solar PV array areas or along the Cable Corridors. Lighting will be limited to that required

for safety and security purposes within the BESS and substation compounds.

- 1.3.8 Where operational lighting is required, it will be designed to minimise environmental effects and will be:
- Motion activated or manually operated
 - Directional and inward facing when in BESS or substation compound areas; and
 - Positioned to avoid illumination of hedgerows, woodland, watercourses, ponds and other sensitive habitats, as well as nearby residential receptors.

Operational Traffic and Access

- 1.3.9 Operational traffic will be low in frequency and will be limited to vehicle movements associated with routine inspection, monitoring, maintenance, landscape management, sheep grazing and occasional component replacement activities. Vehicle movements during operation will typically comprise light goods vehicles or vans, with infrequent visits by specialist maintenance vehicles where required.
- 1.3.10 Access during the operational phase will utilise the permanent access tracks and access points described in **ES Chapter 5: The Proposed Development [EN0110020/APP/6.5]**, and no new access routes will be created during the operation and maintenance phase. All operational vehicles will remain within the Order Limits and will access individual parcels of the Site using the established internal access network.
- 1.3.11 Operational vehicle movements will be managed where necessary to minimise disruption to the local and strategic road networks and nearby receptors.
- 1.3.12 Where operational activities coincide with Public Rights of Way (PRoW) or shared access routes, vehicle movements will be managed to ensure continued safe use of these routes by other users, including pedestrians, cyclists and equestrians, where applicable. Any temporary interaction between operational vehicles and PRoW users will be managed in accordance with the principles set out in the **outline Public Rights of Way Management Plan [EN0110020/APP/5.14]**, where relevant.
- 1.3.13 Normal maintenance activities will be undertaken by Light Goods Vehicles (LGVs). No Abnormal Indivisible Loads (AIL) are anticipated during the operational phase. On the rare occasion that a large electrical component needs replacing, this would be undertaken by a larger vehicle. Parking for operational staff will be limited to designated areas within the Site, and vehicles will not park on the public highway.

Panel Cleaning

- 1.3.14 The frequency and methodology for panel cleaning will be determined during operation, informed by panel performance and site-specific conditions. For the purposes of this oOEMP, a nominal two-year cleaning cycle is assumed, recognising that this may vary over the operational lifetime of the Proposed Development.

- 1.3.15 Panel cleaning will typically be undertaken using a tractor mounted cleaning system with rotating brush mechanisms, consistent with standard industry practice. Cleaning may take place at night or during early morning periods.
- 1.3.16 No chemical cleaning agents will be used, and cleaning will be undertaken using clean deionised water only. Dry-cleaning methods will not be employed, as these may increase the risk of surface scratching and reduced panel efficiency.

Management of Vegetation Planting

- 1.3.17 Vegetation, landscaping and ecological features will be managed throughout the operational phase in accordance with the **outline Landscape and Ecology Management Plan (oLEMP) [EN0110020/APP/5.13]**. The **oLEMP [EN0110020/APP/5.13]** will be developed into a Landscape and Ecology Management Plan (LEMP) post-consent which will be secured via the DCO. The LEMP will set out long-term management, monitoring and aftercare arrangements for the operational phase.

Recovery, Recycling and Disposal of Waste

- 1.3.18 Waste arising during the operation and maintenance phase of the Proposed Development, including waste associated with component replacement, will be managed in accordance with the waste hierarchy, prioritising prevention, preparation for reuse, recycling and recovery, with disposal as a last resort.
- 1.3.19 Operational waste management will be undertaken in accordance with the outline Site Waste Management Plan (oSWMP) presented in the **outline Construction Environmental Management Plan [EN0110020/APP/5.9]**, which will be developed into a Site Waste Management Plan (SWMP) prior to operation.

Water Supply

- 1.3.20 Water requirements during the operation and maintenance phase will be limited and are expected to be associated primarily with panel cleaning and welfare use during maintenance activities. Where required, self-contained portable welfare units may be deployed on an ad hoc basis to support maintenance activities at more remote parts of the Site where use of facilities at the operations and maintenance hub is not practicable. These units will store foul and wastewater for collection and emptying by suitably licensed contractors.
- 1.3.21 Further detail on water sourcing for panel cleaning is provided in Section 0.

Security

- 1.3.22 Security measures will be implemented during operation to ensure the safety of personnel and the integrity of the Site.

Fencing

- 1.3.23 Perimeter fencing around the solar PV array would comprise wooden post and wire fencing or wooden post and galvanised welded wire. Fencing

surrounding the solar PV array is anticipated to be a maximum of 2.2m Above Ground Level (AGL) in height, and if necessary, a double fence may be installed. Mammal gates would be incorporated into perimeter fencing where needed to allow for movement of wildlife.

- 1.3.24 Power conversion station (PCS) enclosures would be surrounded by a welded wire fence which would not exceed a height of 3.5m AGL.
- 1.3.25 The BESS compound would be surrounded by a single or double fence of galvanised welded wire which would be a maximum of 3m AGL in height, with an additional 1m of electrified fencing.
- 1.3.26 The substation and satellite substation compounds would be surrounded by a single or double fence of galvanised welded wire which would be a maximum height of 3m AGL, with an additional 1m of electrified fencing.

During operation, the PCS, BESS equipment, and substation equipment are anticipated to be the main sources of noise. As detailed in **ES Chapter 4: Alternatives and Design Evolution [EN0110020/APP/6.4]**, the design principles for the Proposed Development have been established to prioritise locating potential sources of noise as far as reasonably practicable from noise sensitive receptors. The Proposed Development has in addition implemented embedded mitigation measures to reduce the likelihood of significant adverse effects (see **Table 1.1**), for example, acoustic barriers. If required, acoustic barriers would have a maximum height of 4m AGL. Acoustic barriers will be constructed using a suitable acoustic absorbent material with a minimum reflection loss of 20dB.

- 1.3.27 All fencing would be a muted colour which is sympathetic to the surrounding environment.
- 1.3.28 A list of **Outline Design Parameters [EN0110020/APP/7.3]** has been developed to represent the maximum spatial extent of each component of the Proposed Development. These principles have been considered throughout design development and are continuously tested and improved in response to baseline surveys, design evolution and stakeholder feedback.

CCTV

- 1.3.29 Daytime and infrared closed-circuit television (CCTV) systems, mounted on poles and facing internally, would be installed around the perimeter of the operational areas of the Site. CCTV cameras would be installed on poles along fence lines with a maximum height of 4m AGL. The CCTV cameras would have fixed viewing angles and would be positioned to face along the fence. As detailed in the **outline Landscape and Ecology Management Plan [EN0110020/APP/5.13]** any landscaping and biodiversity works would be designed to avoid compromising the effectiveness of the CCTV or security fencing.

1.4 Responding to Environmental Incidents and Emergencies

- 1.4.1 Procedures for responding to environmental incidents and emergencies during the operational phase will be set out in the OEMP. For the purposes of this oOEMP, the incident response procedures set out in the Outline

Incident Response Plan within the **Outline Construction Environmental Management Plan (oCEMP) [EN0110020/APP/5.9]** will be applied and adhered to, where relevant to operational activities. Where phase-specific measures are required, these will be set out within the OEMP, as appropriate.

- 1.4.2 In relation to the BESS, an **outline Battery Safety Management Plan (oBSMP) [EN0110020/APP/5.15]** has been prepared and will be developed post-consent into a detailed version, which will be secured via the DCO, to address fire prevention, detection, response and recovery measures. Emergency response arrangements will be aligned with the design and operational principles described in **ES Chapter 5: The Proposed Development [EN0110020/APP/6.5]** and will be implemented in consultation with relevant emergency services, where appropriate.

1.5 Environmental Measures

- 1.5.1 This section of the oOEMP sets out the environmental measures to be implemented throughout the operation and maintenance of the Proposed Development to reduce the likelihood of significant effects. All mitigation measures set out in **Table 1.1** represent the minimum environmental controls for the operational phase and will be secured, implemented and, where necessary, refined through the preparation and approved implementation of the OEMP.
- 1.5.2 It is assumed that all environmental measures will accord with the relevant legislation and guidance in force at the time the operational phase is undertaken. **Table 1.1** presents the likely mitigation based on current baseline information, with all measures to be reviewed and, where necessary, updated within the OEMP prior to commencement of operation to reflect final design, site conditions and operational requirements at that time.

Table 1.1 Environmental Measures

| Potential Receptors | Predicted Changes and Potential Effects | Proposed Measures |
|---|---|--|
| Biodiversity and Nature Conservation | | |
| Nocturnal species | Disturbance from an alteration in baseline conditions (e.g. light) | <p>Embedded design measures will be implemented to minimise effects on nocturnal and crepuscular species during operation. These include the absence of perimeter lighting within solar PV areas, with infra-red security systems used in preference to artificial lighting. Routine operational and maintenance activities will be undertaken during daylight hours where practicable, with temporary, task-specific lighting only required for emergency works, equipment failure or panel cleaning.</p> <p>Where operational lighting is required within BESS and substation areas, it will be motion activated or manually operated, directional and designed to minimise light spill onto adjacent habitats, in accordance with best practice. Measures for the control of operational lighting are set out in Section 0 and will be secured and implemented through the approved OEMP.</p> |
| Ecological | Risk that habitat creation and management measures do not achieve the intended Biodiversity Net Gain (BNG) outcomes during the operational phase. | <p>Habitat creation, enhancement and long term management measures will be implemented to deliver a minimum of 10% BNG and to provide benefits for protected, priority and common species during the operational phase. Habitat measures will be secured through the oLEMP [EN0110020/APP/5.13], which will be developed into a LEMP post consent. Habitat creation and enhancement will be focused primarily on site delivery and will include both area and linear habitats.</p> <p>Long term management, monitoring and adaptive management arrangements will be secured through the approved LEMP, with habitat enhancement measures maintained for a minimum period of 30 years following establishment, as is consistent with the legal requirements for BNG</p> |

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| Habitats and species | Reduction in habitat connectivity | Measures to maintain habitat connectivity across the Site during operation will be secured through the OEMP and LEMP . These will include design and management provisions to facilitate the movement and dispersal of fauna across the Site, including along hedgerows, watercourses and between habitat parcels. Connectivity measures may be refined, where necessary, following detailed design and ecological review. |
| Habitats and species | Fragmentation of habitats and species | <p>Measures to avoid habitat fragmentation and to facilitate the movement of badgers and other mammals across the Site during operation will be secured through the OEMP and LEMP . These may include the provision of appropriate access points through perimeter fencing, avoidance of unnecessary lighting and the management of habitats to support commuting and foraging. The need for and specification of such measures will be detailed in the OEMP and informed by ecological evidence and site specific conditions.</p> <p>Habitats within the Site will be managed during operation to contribute towards the delivery of BNG targets and to provide suitable habitat for a range of protected and notable species. Habitat creation, enhancement, management and monitoring principles are set out in the oLEMP [EN0110020/APP/5.13] and will be confirmed through the LEMP prepared post-consent.</p> <p>Habitat management measures may include the management and monitoring of created habitats and ecological features, including artificial bird and bat habitat features and any wetland habitats established as part of the Proposed Development. Grassland habitats will be managed through appropriate operational practices to maintain habitat function and biodiversity value. Long-term management, monitoring and adaptive management arrangements will be secured through the approved LEMP.</p> |

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| Aquatic and semi-aquatic habitats and species | Habitat degradation and destruction | An Outline Surface Water Drainage Strategy (oSWS) [EN0110020/APP/5.17] has been developed and includes measures to manage surface water runoff from the substation and BESS compound areas during operation. The incorporation of sustainable drainage systems (SuDS) will reduce the likelihood and severity of pollution incidents or other adverse effects on aquatic and riparian habitats and species. A detailed Surface Water Drainage Strategy for the onsite substations and BESS compounds, informed by detailed design and infiltration testing, will be prepared post consent and implemented in accordance with the approved OEMP. |
| Landscape and Visual | | |
| Local residents, users of roads and PRowS | Visual effects caused by lighting | The control of lighting in the operational phase of the development is presented in paragraph 0 of this document and will prevent nuisance light to residential, road and PRow receptors. |
| Local residents, users of roads and PRowS, habitats and species | Potential adverse effects on landscape character, visual amenity and ecological function during operation if landscape planting, habitats and retained vegetation are not appropriately managed or maintained | Landscape features, existing vegetation and habitat areas within the Site will be managed during the operational and maintenance phase in accordance with the approved LEMP The LEMP will set out the management objectives and principles for landscape and ecological mitigation during operation, including the maintenance of planting and habitats required to integrate the Proposed Development into the surrounding landscape and support biodiversity objectives. Where monitoring identifies that measures are not achieving their intended objectives, appropriate adaptive management will be implemented. |
| Habitats and species | Risk that landscape and habitat mitigation measures may deteriorate or become less effective over time if not subject to ongoing monitoring and review | Monitoring and review of landscape planting, retained vegetation and habitat creation areas will be undertaken during operation in accordance with the approved LEMP. Monitoring outcomes will be used to inform remedial or adaptive management measures to ensure that landscape and ecological mitigation continues to |

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| | | function as intended over the operational lifetime of the Proposed Development. |
| Cultural Heritage and Archaeology | | |
| Designated and non-designated heritage assets | Indirect effects of the Proposed Development on the setting of designated and non-designated heritage assets | The layout of the Proposed Development (see ES Figure 5.1: Illustrative Masterplan [EN0110020/APP/6.19]) has been informed by the need to locate above ground infrastructure outside the setting of sensitive heritage receptors where practicable, or within areas of the landscape where effects on setting are minimised. Landscape screening (see ES Figure 5.2: Illustrative Mitigation Masterplan [EN0110020/APP/6.19]) may be used to reduce the visibility of infrastructure in views that contribute to the setting and significance of heritage assets. Screening measures, where appropriate, will be delivered through landscape planting and managed in accordance with the approved LEMP. |
| Ground Conditions and Land Quality | | |
| Soil and groundwater quality, habitats and species | Potential effects on soil and groundwater quality as a result of leaks or spills of fuels, oils or other potentially polluting substances, or through encountering and disturbing contaminated soils | Controls to prevent and manage pollution during the operational phase will be secured and implemented through the approved OEMP. These will include measures for the storage, handling and use of fuels, oils and other potentially polluting substances to reduce the likelihood and severity of leaks or spills. Maintenance and operational activities will be undertaken in accordance with appropriate method statements, including procedures for the identification and management of unexpected contamination should it be encountered. Good practice measures will be applied to minimise disturbance to soils and to protect soil and groundwater quality during any operational ground-disturbing activities. |
| Ground conditions and land quality | Potential effects on ground stability, infrastructure and safety | Mine gas risks during operation will be managed through the effective implementation of mine gas monitoring measures, as secured through the OEMP and relevant supporting technical |

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| | due to the migration and accumulation of mine gas | documents. Monitoring arrangements will be designed to identify changing ground gas conditions and to inform any necessary management or control measures required to protect infrastructure, the environment and personnel working on site. Appropriate personal protection equipment will also be used during all maintenance works. |
| Groundwater, habitats and species | Potential effects on groundwater resources resulting from physical intrusion into groundwater, dewatering of excavations during maintenance activities, or the migration of contaminants into groundwater receptors | Operational controls to protect groundwater resources will be implemented through the OEMP. These will include measures to manage any temporary dewatering associated with maintenance works and to avoid unnecessary physical intrusion into groundwater where practicable. Where groundwater is encountered, activities will be managed to minimise the risk of contamination or adverse changes to groundwater quality or flow regimes. |
| Water Resources and Flood Risk | | |
| Surface water, watercourses, habitats and species | Potential Impacts to surface water quality and watercourse geomorphology as a result of erosion, sedimentation or polluted runoff during operational and maintenance activities, including from permanent hardstanding, access tracks, cable maintenance works and watercourse crossings | Operational controls to manage surface water runoff, erosion and sediment mobilisation will be secured and implemented through the approved OEMP and the SWDS . Sustainable drainage systems (SuDS) will be maintained and operated to manage runoff from operational infrastructure, including substations and BESS compounds, and to reduce the likelihood and severity of sedimentation and pollution reaching watercourses. Where maintenance activities involve ground disturbance (including cable repairs or access works), good practice measures will be applied to manage runoff and sediment and to minimise effects on receiving watercourses and geomorphological processes. Measures relating to watercourse crossings and drainage infrastructure will continue to operate in accordance with their approved design and management requirements. |

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| <p>Anthropogenic and ecological receptors</p> | <p>Increase in flood risk and surface water runoff during operation as a result of permanent hardstanding and operational infrastructure, potentially affecting onsite and downstream receptors</p> | <p>Flood risk during operation will be managed through the operation and maintenance of SuDS designed to control runoff rates and volumes from permanent infrastructure. Drainage systems will be maintained to ensure that operational runoff does not exceed approved discharge rates and that flood risk is not increased onsite or downstream.</p> <p>These measures will be implemented and maintained in accordance with the OEMP and the approved drainage strategies, informed by detailed design and infiltration testing.</p> |
| <p>Local residents</p> | <p>Impacts to water abstractions and water supply infrastructure as a result of changes to water quality or quantity, accidental damage to supply lines, or increased water demand during operation, including for panel cleaning and welfare facilities</p> | <p>Water consumption during operation will be managed through the implementation of an operational Water Consumption Plan, developed and secured through the OEMP. This will identify operational water demands (including panel cleaning and welfare use), water sources, and any licences or consents required to ensure that no adverse effects occur to licensed Environment Agency abstractions or private water supplies.</p> <p>Measures to protect water quality, including pollution prevention controls and drainage management, will be implemented to prevent effects on water abstractions and supply infrastructure. Effluent and waste from onsite personnel will be treated at a package sewage treatment plant or a septic tank and will be discharged into a drainage field, in accordance with Pollution Prevention Guidelines (PPG) 4 'Treatment and disposal of wastewater where there is no connection to the public foul sewer' (2017).</p> |
| <p>Surface water, watercourses, habitats and species</p> | <p>Impacts to surface water and groundwater quality as a result of wastewater generation, disposal or accidental release during operation, including wastewater from welfare facilities and panel cleaning activities</p> | <p>Wastewater generated during operation will be managed in accordance with the OEMP. Foul water from welfare facilities will be removed from site by a suitably licensed contractor, with no discharge to surface waterbodies. Wastewater arising from panel cleaning will be directed through the site drainage system and treated via the SuDS treatment train prior to any discharge.</p> |

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| | | All wastewater collection systems will be appropriately maintained to prevent leakage or contamination of surface water or groundwater. |
| | Impacts to surface water quality, groundwater and flood risk arising from fire suppression activities, including uncontrolled discharge of contaminated firewater from the BESS or substation areas | Firewater management measures will be implemented in accordance with the OEMP, the SWDS and BSMP. Firewater will be removed from site by tanker where required, with any water entering the drainage system tested and managed to ensure compliance with relevant discharge standards. |
| Climate Change and Greenhouse Gases | | |
| Anthropogenic and ecological receptors | Increased frequency and severity of extreme weather events (including high temperatures, high winds and intense rainfall) causing damage to electrical infrastructure | Solar PV modules, BESS and substations will be operated and maintained in accordance with manufacturer specifications and standard maintenance regimes designed to address risks associated with extreme heat, wind loading and asset degradation. Procedures for managing environmental hazards and safety risks, including emergency response and incident management (such as fire response), will be implemented through the OEMP, the Incident Response Plan, the BSMP. During both the construction and operational and maintenance phases of the Proposed Development, lower greenhouse gas (GHG) emitting technologies will be utilised. |
| Ground conditions and land quality, local residents, habitats and species | Increased occurrence of ground instability or subsidence during the operational phase, potentially resulting in damage to electrical infrastructure | Maintenance and operational activities will be managed to minimise disturbance to ground conditions, with appropriate measures applied where ground movement or instability is identified to protect infrastructure and maintain safe operation. Where ground-related issues are identified during operation, maintenance and repair works will be undertaken in accordance with appropriate method statements and good practice |

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| | | measures to reduce the likelihood and severity of further impacts, implemented through the OEMP. |
| Anthropogenic and ecological receptors | Adverse effects on operational performance, safety and environmental protection arising from climate change-related hazards | <p>Climate change resilience during operation will be supported through the integration of embedded mitigation measures and operational controls secured through the OEMP and associated plans. These include measures relating to fire prevention and response, drainage and flood risk management, asset cooling systems, and biodiversity and landscape management during periods of water stress.</p> <p>Water required for cooling of BESS and substations will be managed through closed-loop systems to minimise abstraction requirements and enhance resilience during drought conditions. Responsibilities for maintaining biodiversity value during periods of water stress will be implemented through the approved OEMP and related management plans.</p> <p>Wastes will be recycled and disposed of locally.</p> |
| Air Quality | | |
| N/A | N/A | Air quality impacts from routine operation and maintenance activities have been scoped out of the ES and therefore no specific measures are proposed. |
| Traffic and Transport | | |
| N/A | N/A | Traffic associated with the operational phase of the Proposed Development has been scoped out of the ES and therefore no specific measures are proposed. |
| Noise and Vibration | | |

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| <p>Local residents, users of PRowS</p> | <p>Potential impacts to noise sensitive receptors.</p> | <p>Operational noise mitigation has primarily been considered within the context of the first aim of the Government’s Noise Policy Statement for England (NPSE)¹, which is to “<i>avoid significant adverse impacts on health and quality of life from environmental, neighbour and neighbourhood noise...</i>”. Following the guiding principles presented in BS 4142, an increase of less than +5dB above prevailing background noise is not likely to be Significant. This will be achieved by the implementation of the embedded mitigation measures summarised as follows:</p> <ul style="list-style-type: none"> • The layout and design of the Proposed Development prioritises the location of noise-generating infrastructure (including PCS, BESS equipment and substation equipment) as far as reasonably practicable from noise-sensitive receptors, in accordance with the design principles set out in ES Chapter 4: Alternatives and Design Evolution [EN0110020/APP/6.4] • BESS units and substations will be located at least 300m from noise-sensitive receptors, in accordance with ES Chapter 5: The Proposed Development [EN0110020/APP/6.5], as an embedded design control to minimise operational noise effects • BESS units will be designed such that operational noise emissions do not exceed the source sound power levels reported in ES Appendix 14.4: Operation Noise Initial Assessment [EN0110020/APP/6.20]; and • Minimum separation distances between plant and identified assessment locations will be maintained in accordance with the embedded mitigation buffers defined in ES Figures 14.10–14.12 [EN0110020/APP/6.20], based on a realistic worst-case plant layout. |
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| | | <p>Embedded mitigation will include the application of minimum distance constraints between attenuated and unattenuated central container inverters and noise sensitive receptors; The design of the Proposed Development allows for flexibility to refine plant placement within the areas shown in the Works Plan [EN0110020/APP/2.3]. This has been accounted for in an initial noise model using a realistic worst-case placement of plant.</p> |
| Socio-Economics and Land Use | | |
| <p>Local residents, users of PRowS, local economy</p> | <p>Potential adverse effects on existing land uses, recreational assets and local amenity during operation if soils or groundwater are contaminated or operational access is not appropriately managed</p> | <p>The following measures represent embedded design and operational mitigation that will be secured and implemented through the approved OEMP to manage socio-economic, land use and recreational effects during operation:</p> <ul style="list-style-type: none"> • The Proposed Development has been designed and will be operated in accordance with the approved OEMP such that operational activities do not result in contamination of soils or groundwater, thereby protecting existing land uses, agricultural interests and recreational assets throughout the operational lifetime • Operational access arrangements will utilise permanent tracks and established routes within the Site, reducing long-term effects on land use, farming practices and users of PRow • Landscape planting, buffering and long-term management secured through the approved LEMP will support the integration of the Proposed Development into the surrounding landscape, helping to maintain local amenity and recreational value during operation; • The operational phase of the Proposed Development will support ongoing employment opportunities, including jobs |

1 Noise Policy Statement for England (March 2010) - <https://assets.publishing.service.gov.uk/media/5a7956e0ed915d0422067947/pb13750-noise-policy.pdf>

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| | | <p>associated with site operation, inspection, maintenance, landscape and environmental management, contributing to socio-economic benefits within the local Study Area;</p> <ul style="list-style-type: none"> The operation and maintenance of the Proposed Development will contribute to wider national employment benefits through specialist services, asset management and supply-chain activities linked to the UK renewable energy sector. |
| Other Environmental Topics | | |
| Environmental, air quality | Generation of operational and maintenance waste with potential effects on landfill capacity or the environment if not appropriately managed | <p>Waste related impacts will be managed through the implementation of the OEMP and the site Environmental Management System (EMS), ensuring compliance with relevant legislation and application of the Government's guidance on applying the Waste Hierarchy¹. The following measures will be implemented:</p> <p>Application of the Waste Hierarchy during operation, prioritising waste reduction, reuse and recycling;</p> <ul style="list-style-type: none"> Segregation of waste streams to maximise recycling and ensure appropriate handling of hazardous wastes Use of specialist licensed waste contractors for removal and disposal of hazardous and non-hazardous wastes; and Employment of Best Available Techniques (BAT) to minimise waste generation during operation and maintenance activities. <p>Procedures for waste handling, storage and disposal will be set out within the EMS and implemented through the OEMP.</p> |
| Road users, users of PRowS, aviation receptors | Glint and glare from operational solar PV panels affecting road users, PRow users or aviation receptors | <p>Operational control of glint and glare effects will be achieved through the maintenance and implementation of embedded mitigation measures identified in ES Volume 3, Appendix 16.2: Glint and Glare Assessment [EN0110020/APP/6.20], with ongoing management and oversight provided through the OEMP where relevant. The following measures will be implemented where necessary:</p> |

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| | | <ul style="list-style-type: none"> Retention and maintenance of landscape planting and screening designed to reduce glint and glare effects Use of solar PV panels with anti-reflective coatings; and Any operational maintenance or modification activities with the potential to alter glint and glare characteristics will be managed through the OEMP to ensure continued consistency with the assessed mitigation. |
| Local residents | Damage to, or interference with, existing telecommunications and utilities infrastructure during operation, leading to service disruption. | <p>Potential effects on telecommunications and utilities infrastructure will be managed through adherence to embedded safeguarding measures and operational procedures secured via the OEMP. The following outline measures will be implemented:</p> <ul style="list-style-type: none"> Maintenance activities will follow procedures set out in the OEMP to ensure protection of known utilities infrastructure Ongoing liaison with relevant utilities providers will be undertaken where operational maintenance works interact with existing assets; and Protection measures will be secured through the OEMP, with compliance with statutory undertaker requirements and relevant guidance. |
| Local residents, employees, habitats and species | Risk of major accidents or disasters (e.g. fire, flooding, infrastructure failure) affecting people, the environment or infrastructure | Operational risks relating to major accidents and disasters will be managed through the OEMP, incorporating the EMS and relevant subsidiary management plans. This includes implementation of the BSMP and the ongoing use of Hazard and Risk Analysis (HRA) to manage and reduce risk during operation. |
| Local residents, users of PRow, species | Exposure of the public (including PRow users and nearby receptors) and ecological receptors to electromagnetic fields arising from operational high-voltage underground cables. | Exposure of the public and ecological receptors to electromagnetic fields (EMFs) will be managed through the implementation of embedded design measures and operational controls secured via the OEMP. High-voltage electrical infrastructure will be installed and operated in accordance with relevant legislation, industry standards and guidance to ensure EMF levels remain within accepted limits. All high-voltage electricity transmission will be delivered via underground cabling, with cable routing and installation designed to minimise potential |

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| | | exposure to receptors. EMF-related mitigation measures and assumptions will be secured, implemented and subject to review through the approved OEMP. |
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1.6 Implementation and Operation

1.7 Roles and Actions Required

- 1.7.1 The OEMP will set out all roles, responsibilities and actions required in respect of implementation of the measures described in this oOEMP, which are likely to include:
- An organisational structure (organogram) identifying team roles, named personnel and associated responsibilities during the operation and maintenance phase of the Proposed Development
 - Training requirements for relevant personnel in relation to environmental management and compliance
 - Arrangements for site inductions, briefings and toolbox talks to ensure personnel have an appropriate level of awareness and understanding of environmental control procedures
 - Measures to ensure employees are informed of changing site conditions, activities or environmental requirements as operations progress
 - Communication protocols for internal and external environmental management matters
 - Document control procedures to ensure that current and approved environmental documentation is maintained and implemented
 - Arrangements for environmental monitoring, inspections and audits of operational activities; and
 - Procedures for responding to environmental incidents and emergencies.
- 1.7.2 The Environmental Manager and Site Manager will be responsible for ensuring compliance with the oOEMP and the approved OEMP.

1.8 Monitoring and Reporting

Monitoring

- 1.8.1 Monitoring and reporting will be undertaken throughout the operation and maintenance of the Proposed Development to assess the mitigation measures detailed in the OEMP.
- 1.8.2 As part of the monitoring process, the Environmental Manager will observe operation and maintenance activities and report any deviations from the OEMP in a logbook along with all corrective actions taken at the time. The Environmental Manager will additionally communicate with the Site Manager and the Applicant where necessary, to organise and conduct regular walkover surveys and formal inspections.
- 1.8.3 The Environmental Manager will also act as the primary contact with relevant Local Planning Authorities and regulatory bodies.

Records

- 1.8.4 Records associated with monitoring, inspections and audits will be managed through the Principal Contractor's Quality and Safety Management Systems and Environmental Management System, certified in accordance with ISO 14001. The Environmental Manager and / or Site Manager will retain records of all monitoring, inspections and audits. These records will include, but not be limited to:
- Environmental surveys and investigations
 - Results of routine Site inspections
 - Licences and approvals; and
 - Corrective actions taken in response to accidents and incidents or complaints received from a third party.
- 1.8.5 The OEMP will be updated if it is necessary to implement additional mitigation measures and a full review will be undertaken throughout the construction phase. Existing mitigation measures will not be amended without agreement with the relevant LPAs.
- 1.8.6 The Site Manager will be responsible for implementing the approved OEMP and for maintaining appropriate records to demonstrate compliance with its requirements. The Applicant will be kept informed of any material environmental issues or potential non-compliances arising during operation and maintenance in order to monitor overall compliance with the DCO.

References

¹ Department for Environment, Food & Rural Affairs (Defra) (2011). *Guidance on applying the Waste Hierarchy*. London: HMSO. Available at: <https://www.gov.uk/government/publications/guidance-on-applying-the-waste-hierarchy>. Accessed: April 2026



WHITESTONE
solar farm

Contact

Whitestone Net Zero Ltd

info@whitestonesolarfarm.co.uk

0800 688 9936