One Earth Solar Farm

Volume 6.0 Environmental Statement [EN010159]

Volume 3: Non Technical Summary

February 2025

Document Reference: EN010159/APP/6.22

Revision 01

Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009 – Reg 5 (2) (a)

One Earth Solar Farm Ltd.

one earth solar farm

Contents

1 Key Terms

Baseline	Refers to existing conditions as represented by latest available survey and other data which is used as a benchmark for making comparisons to assess the impact of development.
Constraint	Any natural, ecological, or physical factor that restricts, influences, or limits the feasibility, design, or implementation of a Proposed Development.
Construction effects	Used to describe both temporary effects that arise during the construction phases as well as permanent existence effects that arise from the physical existence of development (for example new buildings).
Decommissioning effects	Used to describe the effects that arise during the shutdown, removal or dismantling of a development.
Embedded Design Measures	The mitigation that has been built into the scheme to minimise effects.
Enhancement	Proactive measures taken to improve environmental, social, or economic conditions in a project area, beyond just mitigating negative impacts.
Environmental Impact Assessment (EIA)	The process of evaluating the likely significant environmental effects of a proposed project or development over and above the Baseline.
Environmental Measures	Measures which are proposed to prevent, reduce and where possible offset any significant adverse effects (or to avoid, reduce and if possible, remedy identified effects (GLVIA3, 2013 Para 3.37).
Environmental Statement (ES)	A statement that includes the information that is reasonably required to assess the environmental effects of the development and which the applicant can, having regard to current knowledge and methods of assessment, reasonably be required to compile, but that includes at least the information referred to in the EIA Regulations.
Impact	The change resulting from an action.
Indirect effects	Effects that result indirectly from a proposed development as a consequence of the direct effects, often occurring away from the site, or as a result of a sequence of interrelationships or a complex pathway. They may be separated by distance or in time from the source of the effects. Often used to describe effects on landscape character that are not directly impacted by a proposed development such as effects on perceptual characteristics and qualities of the landscape.
Likely Significant Effects	It is a requirement of Environmental Impact Assessment Regulations to determine the likely significant effects of a proposed development on the environment which should relate to the level of an effect and the type of effect.
Magnitude (of change)	A term that combines judgements about the size and scale of the effect, the extent of the area over which it occurs, whether it is reversible or irreversible and whether it is short term or long term in duration'. Also known as the 'degree' or 'nature' of change.
Mitigation Hierarchy	A structured approach to managing and minimising negative environmental impacts of the Proposed Development. It consists of four key stages, ordered by preference: Avoid, Prevent, Reduce, Offset.
Operational Effects	Used to describe the effects that arise the active phase of a development, after construction is complete and the infrastructure is in use. This includes the undertaking of maintenance.
Planning Inspectorate	Deals with planning appeals, national infrastructure planning applications, examinations of local plans and other planning-related and specialist casework in England and Wales.
Preliminary Environmental Information Report	The Written output of the Environmental Impact Assessment undertaken to date for a proposed development. It is developed to support formal consultation and presents the preliminary findings of the assessment to allow an informed view to be developed of a proposed development, the assessment approach that has been undertaken, and the preliminary conclusions on the likely significant effects of a proposed development and environmental measures proposed.

Receptor	A specific entity (human, ecological, or physical) that may be affected by environmental changes resulting from a Proposed Development.
Scoping Opinion	The opinion adopted by the Secretary of State for the Proposed Development on 22 December 2023.
Scoping Report	The report submitted to the Secretary of State on 13th November 2023 by the Applicant in support of a request for a scoping opinion in connection with the Proposed Development.
Sensitivity	A term applied to specific features, combining judgements of the susceptibility of the feature to the specific type of change or development proposed and the value associated with that feature.
Significance	A measure of the importance of the environmental effect, defined by criteria specific to the environmental aspect.
Significant effect	It is a requirement of the EIA Regulations to determine the likely significant effects of a development on the environment which should relate to the level of an effect and the type of effect. Where possible significant effects should be mitigated. The significance of an effect gives an indication as to the degree of importance (based on the magnitude of the effect and the sensitivity of the receptor) that should be attached to the impact described.
Temporary or permanent effects	Effects may be considered as temporary or permanent. In the case of solar energy development, the application is for a 60-year period after which the assessment assumes that decommissioning will occur and that the site will be restored. For these reasons the development is referred to as long term and reversible.

2 Introduction

2 Introduction

2.1 What is this Document?

2.1.1 This is the Non Technical Summary (NTS) prepared on behalf of One Earth Solar Farm Ltd (Applicant), to satisfy requirements of the Environmental Impact Assessment (EIA) process, for the One Earth Solar Farm (Proposed Development). This NTS is a stand-alone document provided alongside the full report of the assessment, this being the Environmental Statement (ES) which is presented in Volume 6.0 of the Development Consent Order Application

2.1.2 The ES is a comprehensive report which provides the environmental information gathered to identify the likely significant effects on the environment as a result of the construction, operation and maintenance, and decommissioning of the Proposed Development. This NTS presents a provides a clear overview of the key findings of the EIA undertaken for the Proposed Development, using accessible (non-technical) language.

2.2 What is one Earth Solar Farm?

2.2.1 The Proposed Development is a proposed new solar farm with associated BESS (Battery Energy Storage System), Power Conversion Stations (PCS), on-site substations and associated Grid Connection Infrastructure (such as underground cables) which will allow for the generation and export of electricity to the proposed National Grid High Marnham Substation. The Proposed Development would help meet the country's need for a clean energy transformation to combat climate change and enhance energy security. The Applicant has secured a connection agreement with National Grid which would allow export and import of up to 740 megawatts (MW) of electricity to the National Grid High Marnham Substation.

2.2.2 The Proposed Development is a Nationally Significant Infrastructure Project (NSIP) under the Planning Act 2008, as it will have the capacity to generate, store and export more than 50 MW of electricity. Under the Planning Act, a type of planning consent called a Development Consent Order (DCO) is required.

2.2.3 Following an examination by an examining authority appointed by the Planning Inspectorate (PINS), this Application will be decided by the Secretary of State for Energy Security and Net Zero.

2.3 Who wants to develop One Earth Solar Farm?

2.3.1 The Proposed Development is being brought forward by One Earth Solar Farm Ltd, which is a joint venture between PS Renewables and Ørsted.

2.3.2 Established in 2012, PS Renewables is one of the UK's largest privately held companies that specialises in the development and asset management of renewable energy projects. PS Renewables' existing solar farm portfolio totals over 300MW of electricity producing potential in the UK.

Ørsted is a leading offshore wind developer in the UK; currently operating 12 offshore wind farms, alongside onshore wind farms in Scotland, and also owning and operating sites for energy storage. Ørsted is committed to ensuring that its presence contributes to sustainable growth and development, helping to support UK net-zero targets and benefit the communities in which it operates.

2.4 Who is on the Project Team?

2.4.1 PS Renewables and Ørsted are being supported in developing the DCO Application for the Proposed Development by an experienced team of specialists in design, planning, engineering, landscaping, communications, and environmental consultation.

2.4.2 The One Earth Environmental Consultant Technical team includes the following organisations: Logika Group (consisting of three sister companies - Air Quality Consultants Ltd, Noise Consultants Ltd and Logika Consultants); Iceni Projects; RSK and ADAS (an RSK company); and Pell Frischmann.

3 One Earth Solar Farm Overview

3 One Earth Solar Farm Overview

3.1 What are the components of One Earth Solar Farm

3.1.1 The Proposed Development will include the construction, operation (including maintenance) and decommissioning of ground-mounted solar PV panel arrays and associated infrastructure to generate electricity. The solar PV panels will convert the sun's energy into electricity for export to the national electricity transmission network (also known as the National Grid) via a proposed National Grid substation at High Marnham (a new substation). The Proposed Development will include the following components illustrated in **Figure 1**. The indicative layout of the components within the Site is displayed in **Figure 2** to provide a visual representation of the distribution of Solar PV Panels and associated infrastructure that could be constructed. It is noted that **Figure 2** has been presented for illustrative purposes only.

Figure 1: Components of One Earth Solar Farm

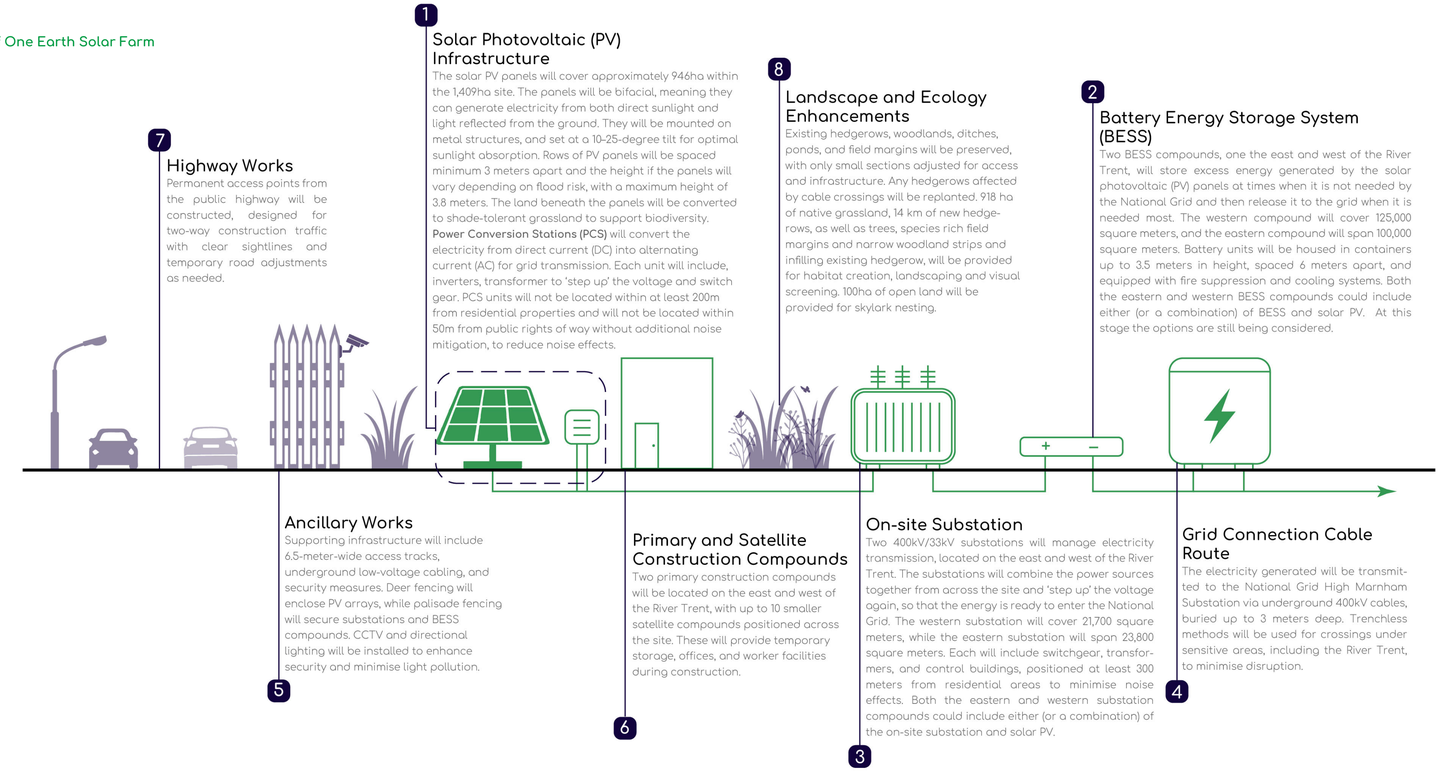
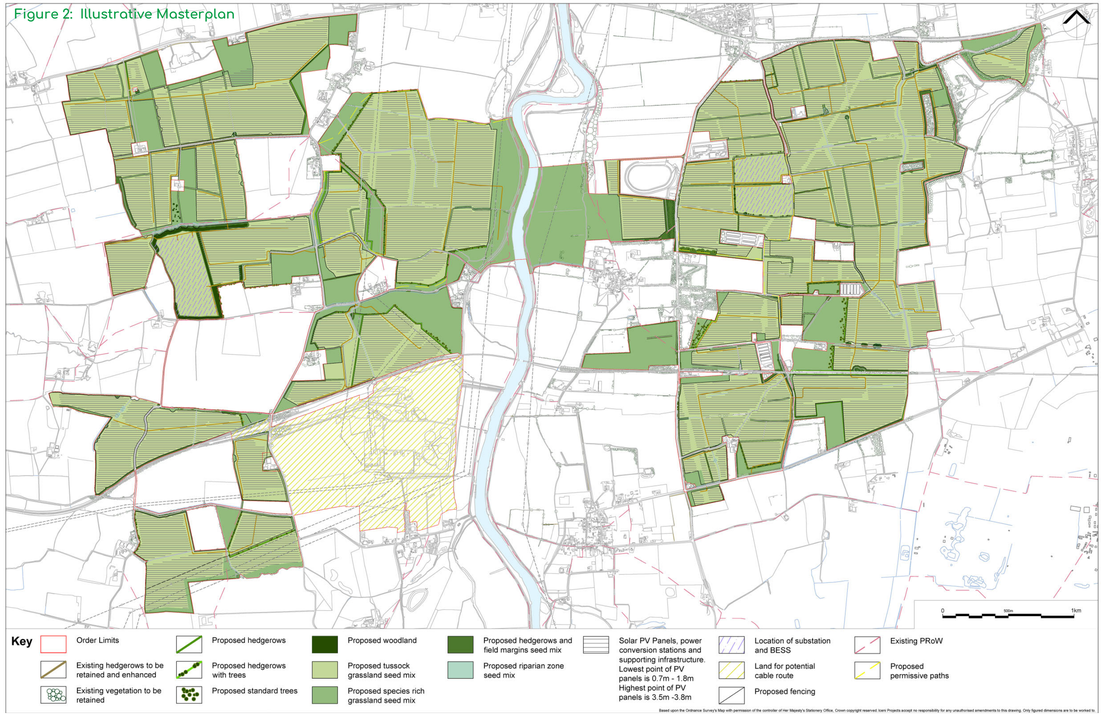


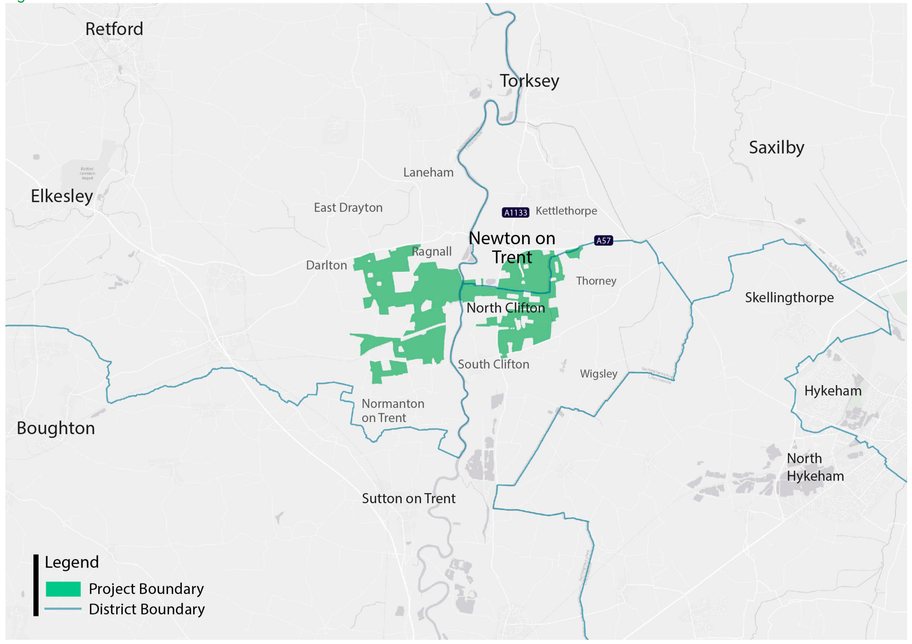
Figure 2: Illustrative Masterplan



3.2 Where will One Earth Solar Farm be located?

3.2.1 The Proposed Development site is approximately 1,409 hectares (ha) of land, to the east and west of the River Trent. Approximately 1,203ha of the Site falls within Nottinghamshire and the remaining 206ha of the Site falls within Lincolnshire. The Proposed Development is located in the jurisdiction of both Nottinghamshire and Lincolnshire County Councils and extends across three district areas: Newark and Sherwood District Council, West Lindsey District Council and Bassetlaw District Council as demonstrated in **Figure 3**.

Figure 3: Site Location



3.3 When will One Earth Solar Farm be developed?

3.3.1 The construction phase of the Proposed Development is anticipated to commence in 2027 and completed in 2029. Construction activities will be undertaken in accordance with the principles set out in the **outline Construction Environmental Management Plan (oCEMP)** (see **Volume 7, Other Documents [EN010159/APP/7.4]**). The **oCEMP** is document that sets out all the measures and actions the Applicant would have to undertake during construction to limit or avoid potential environmental effects. For example, for air quality it sets out details on the dust control measures to ensure nuisance dust or fine particles are controlled and do not result in potential effects.

3.3.2 The Proposed Development is expected to be operational for a period of up to 60 years (2030-2090), after which it will be decommissioned. During this time there will be regular maintenance required; this includes the undertaking of panel cleaning, vegetation and habitat management and the replacement of faulty equipment.

3.3.3 The decommissioning phase is expected to take two years (2090-2092) and will include the removal of all above ground infrastructure, including the BESS and Substation foundations. Permissive paths will also be removed, however underground cables may remain. Planted trees and hedgerows will be retained, as well as any access bridges created over ditches and watercourses.

3.4 What are the Constraints and Opportunities at the Site?

3.4.1 The design of the Proposed Development has been carefully developed to be sensitive to the surrounding environment, by avoiding or minimising environmental effects where possible, proposing mitigation and taking opportunities for enhancement.

3.4.2 Some of the key environmental limiting factors (constraints) that have been considered in the design of the Proposed Development include flood risk, local wildlife sites, and the presence of nearby villages and heritage assets, including listed buildings and Scheduled Monuments, as visualised in **Figure 4.**

3.4.3 The Site also includes environmental opportunities, those that can be used to enhance or improve the Proposed Development. Key opportunities include the proximity of the Site to A roads, which helps reduce traffic effects, and its flat land and large fields, which allow for efficient solar panel placement with minimal vegetation loss. There is also potential to enhance biodiversity by improving the existing low-diversity habitats due to the growing of arable crops, as well as reinstating lost habitats such as coastal and floodplain grazing marsh. Additionally, the limited existing footpaths presents an opportunity to create new walking routes, improving local access and connectivity.

Figure 4: Local Constraints

3.5 How was the Site selected and what alternatives were assessed?

3.5.1 For the Proposed Development, exploring alternatives at every stage has been central to shaping decisions, from technical solutions to cable route planning.

3.5.2 The Applicant has applied the mitigation hierarchy to the design of the Proposed Development, which prioritises avoiding, preventing, reducing, and if required offsetting environmental effects (see **Section 3.7** and **Figure 6**). This approach influenced the site selection process, ensuring that not only was proximity to the proposed High Marnham Substation considered, but also key environmental factors (see **Site Selection Report, Appendix 1 of the Planning Statement [EN010159/APP/5.5]**).

3.5.3 The chosen Site was selected based on its proximity to the proposed High Marnham Substation. This location allows for an efficient grid connection without requiring major infrastructure upgrades or a very long cable route. The proposed area consists of large, open land with low population density, minimising effects on nearby residents while also being outside protected landscapes and designated biodiversity sites. At the time of site selection, the agricultural classification soil maps produced by Natural England showed the area as not being of the highest soil quality. Careful planning has ensured that key infrastructure placed in low-risk areas outside of areas of flood and elevated above the future climatic flood level where necessary. The land is also easily accessible from main roads, reducing construction effects on smaller local roads. Another factor for site selection was whether landowners were willing to provide their land for the Proposed Development, which means use of compulsory acquisition powers can be minimised.

3.5.4 The combined use of solar energy with crops or livestock was considered, however deemed unfeasible due to landowner disinterest, lack of livestock facilities, and the negative landscape, visual, and cultural effects of raising solar panel heights that would be needed if grazing was also to be accommodated. Alternative locations were assessed but were less suitable due to greater ecological sensitivity, landscape constraints, and potential conflicts with other planned developments. This location was ultimately selected as the most viable option for delivering large-scale renewable energy while minimizing environmental and community effects.

3.5.5 The 'do nothing' alternative, of not building a solar farm was not considered as a reasonable alternative as it would not support the UK's renewable energy goals or its net zero targets. Other technologies, such as tidal power, offshore wind, and hydroelectric storage, were dismissed due to the Site's inland location and lack of suitable physical and climatic conditions. Onshore wind was considered economically unviable due to low wind yields, potential environmental effects, and residential proximity. It is therefore considered that the Proposed Development is the best renewable generating solution for the Site.

One Earth Solar Farm
Environmental Statement Volume 3: Non Technical Summary

3.6 How did the design develop?

3.6.1 The design process has evolved iteratively, taking into consideration the potential for any significant environmental effects, the planning and environmental policy objectives and overall functionality, as well as feedback from stakeholders and public consultation. The iterative process is visualised in **Figure 5**.

3.6.2 The Proposed Development adopted a good design approach, which requires a holistic approach from all disciplines to integrate into a single design solution. Project specific design principles were adopted at the outset of the project. Based on the 'Design Principles for National Infrastructure' guidance published by the National Infrastructure Commission Design Group, the design principles were drafted under the headings of climate, people, places and value.

One Earth Solar Farm
Environmental Statement Volume 3: Non Technical Summary

Figure 5: Project Timeline

Non-Statutory Consultation

01

Public and stakeholder feedback obtained to inform the initial outline proposals which can later be refined.

2023
September-November

EIA Scoping

02

2023
November

Initial site boundary and master-plan which included potential areas for solar and environmental mitigation and enhancement, as well as areas of search for cable routes. The Order Limits comprised approximately 1,500Ha.

Community Update

03

Follow-up communication with stakeholders following initial consultation events, further explanation of the process and answering key overarching questions.

2024
January

Community Update

04

2024
April

Launch of the One Earth Community Fund, and indications of design changes including the removal of solar panels near homes and communities, and locations of key infrastructure including substations, to be presented in the PEIR

PEIR Publication

05

The PEIR boundary remained approximately 1,500ha, however a more defined solar PV site area of 965ha was proposed.

2024
May

Statutory Consultation

06

2024
May-July

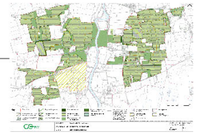
Public and stakeholder feedback obtained to inform the updated proposals that are submitted as part of the DCO application.

DCO Application Submission

07

The Order Limits total approximately 1,433Ha. The DCO accounts for the PEIR assessment results and feedback, as well as further design and environmental refinement.

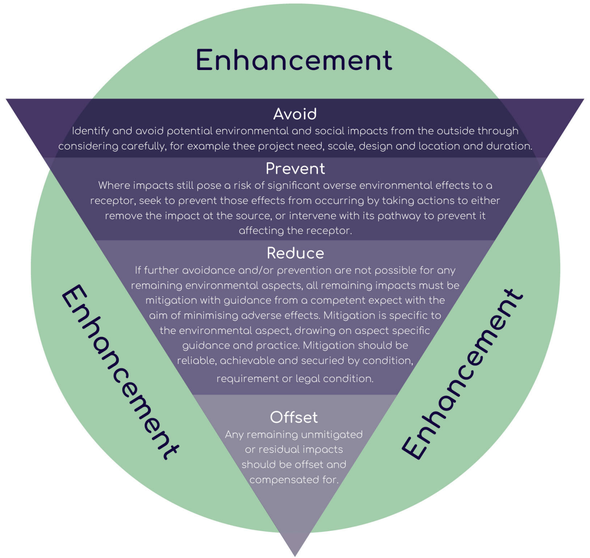
2025
Q1



3.7 What environmental measures are embedded into the design?

3.7.1 The EIA regulations set out the mitigation hierarchy, to embedded environmental measures into the design. The key stages of the mitigation hierarchy are to avoid, prevent, reduce or offset environmental effects as shown in **Figure 6.** The mitigation hierarchy is an ongoing process that has been applied throughout, from the start of the project, overall design and consideration of alternatives, and again within individual assessments of environmental aspects. In addition to what is required by the mitigation hierarchy to mitigate negative effects, opportunities for enhancement have also been taken to improve the environmental conditions.

Figure 6: Mitigation Heirarchy [1]



[1]Institute of Environmental Management & Assessment (IEMA) (2024). Mitigation in EIA: Guidance on the Effective Design and Implementation of Mitigation Measures. [Online], Available: [https://www.iema.net/policy-and-practice/impact-assessment/practical-guidance/] [Accessed February 2025].

3.7.2 Some examples of the embedded environmental measures are visualised in **Figure 7.** To address flood risks, the solar PV panels are elevated to at least 0.7 metres above ground level in some areas and up to 1.8 metres in areas which are more flood-prone thereby allowing flood water to flow freely beneath them.

3.7.3 The design for the positioning of solar PV panels and associated infrastructure incorporates a number of off-sets from sensitive features. Noise modelling ensured that the BESS and substation components are positioned to avoid adverse noise effects on nearby residents and public areas without acoustic mitigation. Buffers and setbacks are added to address concerns raised during consultations with local residents and parish councils, ensuring sensitive placement of solar PV panels away from residential dwellings and features such as drainage ditches, watercourses, hedgerows and tree lines, and Public Rights of Way (PRoW). These offsets are vital to minimising environmental effects such as those that might occur to biodiversity, noise, and landscape and visual receptors.

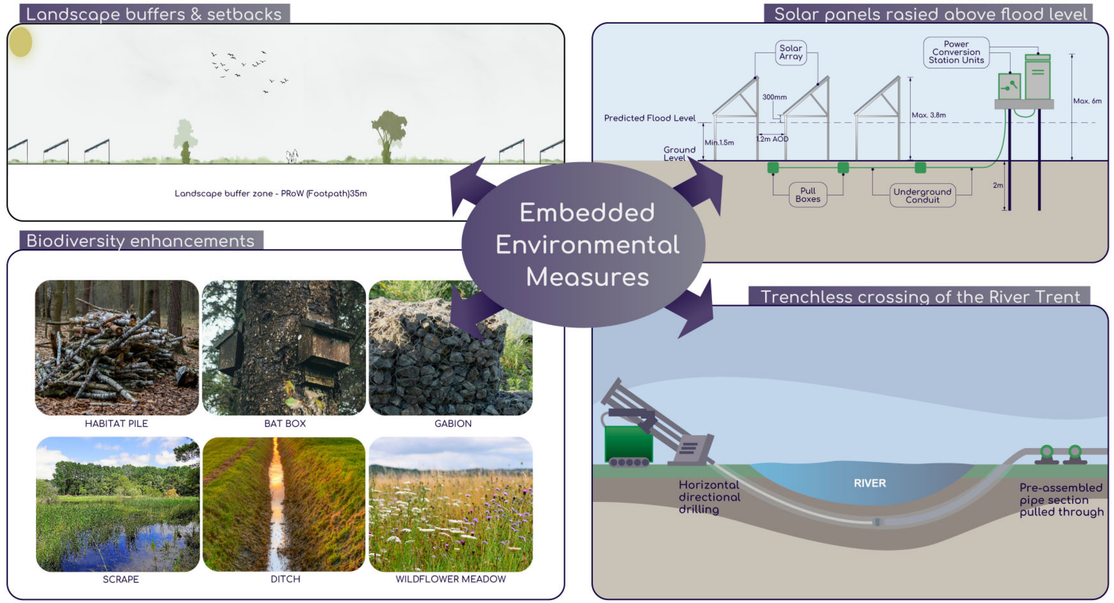
3.7.4 Two methods for crossing power cables across the River Trent were considered at statutory consultation and detailed within the Preliminary Environmental Information Report (PEIR). This included using the Fledborough Viaduct to which a cable would be fixed; or locating a cable under the river by a method known as "trenchless crossing". Following technical assessments and stakeholder feedback, trenchless crossing was selected as the preferred option as it minimised effects on visual amenity and cultural heritage, including in particular because it would preserve the historical and aesthetic value of the Fledborough Viaduct. Cables would be installed at least 5 meters below the riverbed, thereby preserving the river's structure, protecting its habitats, and avoiding other above ground disruption.

3.7.5 Mitigation and enhancement areas are provided for habitat creation, landscaping and visual screening including approximately 918 ha of native grassland planting, 5.5 ha of woodland planting, 14 km of new hedgerow planting, as well as 'gapping up' of approximately 58 km of existing hedgerow. The design also includes other biodiversity enhancement measures including the provision of beetle banks. Furthermore, there will be offsetting provisions made for skylark including in particular 100 ha of grassland, arable or set-aside habitat suitable for nesting at high densities and which is situated within large fields that contains no solar or BESS infrastructure. The Proposed Development would also deliver Biodiversity Net Gain (BNG) through enhancements to non-linear habitats (grasslands and fields), linear habitats (hedgerows) and rivers/ditches. In addition, to improve public access across the site series of permissive paths totalling approximately 6 km will be provided, which are open to equestrians, cyclists and pedestrians.

3.7.6 Specific environmental measures relevant to the technical aspects have been identified and have been considered as part of the technical assessments (i.e. the assessments have been undertaken with the inclusion of the environmental measures, as these measures form part of the Proposed Development).

3.7.7 All environmental measures proposed are presented within a **Commitment Register** (see **Volume 7: Other Documents [EN010159/APP/7.15]**).

Figure 7: Embedded Design Measures



4 Environmental Impact Assessment Process

4 Environmental Impact Assessment Process

4.1 What is an Environmental Impact Assessment (EIA)?

4.1.1 The purpose of EIA is to ensure that the likely significant environmental effects of the Proposed Development are understood and properly taken into account when decision-makers consider an application for development consent.

4.1.2 Through the EIA process, the likely significant environmental effects arising from the construction, operation and maintenance, and decommissioning phases of the Proposed Development are assessed. If significant adverse effects are expected, measures are proposed to prevent, reduce and where possible offset the effects caused (referred to as either environmental measures or mitigation measures).

4.1.3 EIA is an impartial process that provides information to decision-makers. It also supports sustainable development by informing the project evolution to minimise environmental effects, including its design, construction, operation (including maintenance) and where relevant, decommissioning. Consultation is a crucial element, engaging decision-makers, statutory authorities, the public, and other relevant stakeholders to gather feedback throughout the process.

4.2 The EIA Process for One Earth

4.2.1 EIA is a systematic process that comprises a number of steps as summarised in the **Figure 8** along with key milestones that have been undertaken to date.

4.2.2 A key Stage of the EIA Process us Scoping, which helps determine the specific environmental aspects that need detailed assessment within the ES (scoped in), and which can be excluded (scoped out). This ensures that the EIA focuses on significant environmental effects, making the assessment process more efficient and relevant. An EIA Scoping Report was submitted to the Planning Inspectorate in November 2023, which set out the potential significant effects of the Proposed Development and the environmental aspects that the ES should focus upon and the methods for assessing them. Desk-study and survey work were carried out to identify the environmental baseline of the Site and informed the EIA Scoping Report.

4.2.3 Following the submission of the Scoping Report, the Planning Inspectorate issued a formal Scoping Opinion in December 2023, confirming which environmental aspects required detailed assessment in the ES. The Scoping Opinion is based on consultation with statutory bodies, who provide expert input on potential environmental effects. It also helps establish the methods and approach for environmental studies, ensuring consistency with legal and planning requirements.

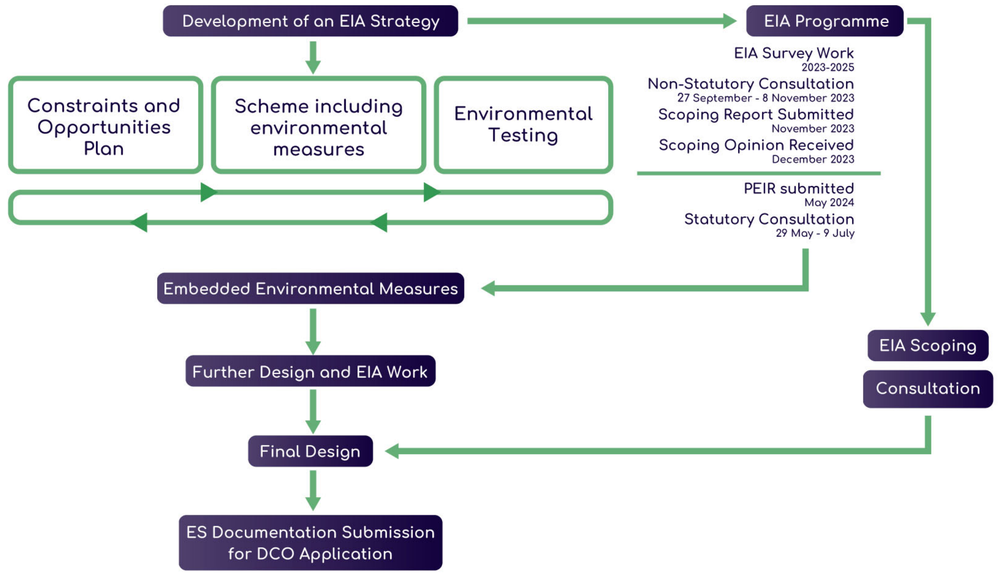
4.2.4 As part of the One Earth EIA process, two rounds of public consultation were carried out to gather feedback on the Proposed Development and its potential environmental effects.

4.2.5 The first consultation, known as the Non-Statutory Consultation, took place between 27th September and 8th November 2023. This was a voluntary process undertaken by the Applicant to seek early feedback on the initial proposals. The purpose was to engage with stakeholders, including local communities, environmental groups and authorities, to help shape the development before more detailed assessments were conducted.

4.2.6 The second consultation, known as the Statutory Consultation, was held between 29th May to the 9th of July 2024. Unlike the first consultation, this was a legally required process, undertaken in accordance with planning regulations. The Statutory Consultation was supported by the production of PEIR. The PEIR set out our preliminary findings on the likely significant environmental effects that may arise from the Proposed Development and was prepared to enable stakeholders and members of the public to gain an understanding of the environmental effects at that stage of the project.

4.2.7 The feedback and findings from these EIA processes have directly shaped the embedded environmental measures and the design of the Proposed Development.

Figure 8: EIA Process



4.3 How are the Environmental Impacts assessed in the Environmental Statement?

4.3.1 For each environmental aspect, the current environmental conditions i.e. the baseline, were identified through desk-study, surveys and consultation. The potential changes from the existing baseline as a result of the Proposed Development during its construction, operation and maintenance, and decommissioning were assessed to establish whether there were likely to be significant effects. The method to establish whether these effects are significant or not, varies by environmental aspect, as is detailed in the technical chapters of the ES.

4.3.2 Effects identified may be direct or indirect, short-term, medium-term and long-term, permanent and temporary, beneficial or adverse. The sensitivity of a resource or receptor and magnitude of each potential effect on a particular resource or receptor is also assessed and defined depending on environmental aspect specific criteria.

4.3.3 The assessment is done considering the effect on 'receptors', which are the thing experiencing the effect, for example the receptor could be animals, a landscape, people. The significance of the environmental effect is generally determined by considering the relationship between the sensitivity of the receptor (that is, how sensitive it is to changes), and the magnitude of the change (that is, how big is the change). In general terms, when a bigger change is expected to happen to a very sensitive receptor, a significant effect would be expected. Whereas a smaller change especially where a receptor is not so sensitive to change, may only result in a very small effect which is not significant. However, a variety of sources including legislative requirements and regulations, aspect-specific guidance, standards, advice from statutory consultees and other stakeholders and the expert judgement of the team undertaking the EIA are also considered and therefore the approach varies slightly by environmental aspect.

4.3.4 The exact locations of solar PV panels and associated infrastructure will be finalised during the detailed design stage after the determination of the DCO Application. The Proposed Development maintains flexibility using the 'Rochdale Envelope' Approach. This method defines maximum (or minimum) parameters (e.g. size, height and location) for assessing environmental impacts. This ensures that a reasonable 'worst-case' scenario is considered, and that environmental effects will not exceed those identified in the ES following design changes. These parameters are legally secured by the DCO, meaning the Proposed Development will remain within the assessed boundaries.

5 Likely Environmental Effects

5 Likely Environmental Effects

5.1 Summary of Environmental Effects by Environmental Aspect

5.1.1 There are no significant effects generated from the Proposed Development in relation to Hydrology, Buried Heritage, Transport and Access, Air Quality, Noise and Vibration. Significant environmental effects are predicted in relation to Biodiversity, Landscape and Visual, Land and Soils, Cultural Heritage, Carbon and Climate Change, Human Health and Socio-Economics. The details of the likely significant effects across the project phase (construction, operation and decommissioning) are listed in Table 1. The sections that follow expands the environmental effects per aspect, and the individual aspects chapters of the ES provide more technical detail.

Table 1: Summary of Significant Environmental Effects by Environmental Aspect

Environmental Aspect	Phase	Description of Effect	Likely Significant Effects
Biodiversity	Construction, operation and decommissioning	Coastal and floodplain grazing marsh: habitat creation, enhancement and changes to hydrology, spread of invasive species, pollution.	Likely significant beneficial effects
		Hedgerow: Habitat loss / degradation and habitat creation / enhancement.	
		Ponds: habitat creation, enhancement and changes to hydrology, spread of INNS, pollution.	
		Permanently wet ditch: habitat creation, enhancement and changes to hydrology, spread of INNS, pollution.	
		Other neutral grassland: habitat creation, enhancement and changes to hydrology, spread of INNS, pollution.	
		Other breeding birds: Habitat loss, degradation, disturbance. Habitat creation / enhancement.	
		Water vole: Habitat loss, degradation, fragmentation, disturbance. Habitat creation / enhancement habitat creation / enhancement.	
		Reptiles: Habitat loss, degradation, fragmentation, disturbance. Habitat creation / enhancement habitat creation / enhancement.	
		Brown hare and Hedgehog: Habitat loss, degradation, fragmentation, disturbance. Habitat creation / enhancement habitat creation / enhancement.	
Land and Soils	Operation	Very high sensitivity soils: Impact on soil quality.	Likely significant beneficial effects
		Very high sensitivity soils: Impact on availability of agricultural land.	
Cultural Heritage	Construction and decommissioning	Visual and experiential effects of construction and decommissioning activity on the heritage value of 9 Designated Assets or groupings.	Likely significant adverse effects
	Operation	Potential impact on key element of setting which contributes to the value of 4 Designated Assets or groupings.	Likely significant adverse effects

Environmental Aspect	Phase	Description of Effect	Likely Significant Effects
Landscape and Visual	Construction	Impact on the landscape character within the Proposed Development, from a change of use of land use from predominantly agricultural to an active construction site	Likely significant adverse effects
		Impact on 5 of the 17 published character areas due to a change of use of land use from predominantly agricultural to an active construction site.	
		Impact on the village character on 4 of the 17 local village character areas, due to a change of use of land use from predominantly agricultural to an active construction site.	
		Impact on 29 of the 76 worst-case viewpoints considered, due to introduction of construction activity.	
	Operation (Year 1)	Impact on the landscape character within the Order limits, from changes and alteration to landform and vegetation cover.	Likely significant adverse effects
		Impact on 4 of the 17 published landscape character areas, due to changes and alteration to landform and vegetation cover:	
		Impact on the village character of 2 of the 17 local village character areas, (taking account of sapling planting) due to changes and alteration to landform and vegetation cover:	
		Impact on 18 of the 76 worst-case viewpoints considered, due to changes and alteration to landform and vegetation cover from operation (taking account of sapling planting).	
	Operation (Year 15)	Impact on the landscape character within the Order limits, from changes and alteration to landform and vegetation cover (taking account of established and matured planting, along with the proposed grassland forming a continuous sward beneath the modules and around the field margins).	Likely significant adverse effect
		Impact on 2 of 17 published landscape character areas, (taking account of established and matured planting, along with the proposed grassland forming a continuous sward beneath the modules and around the field margins) due to changes and alteration to landform and vegetation cover:	
		Impact on the village character of 2 of 17 Of the 17 local village character areas (taking account of established and matured planting, along with the proposed grassland forming a continuous sward beneath the modules and around the field margins) due to changes and alteration to landform and vegetation cover.	
		Impact on 11 of of the 76 worst-case viewpoints due to changes and alteration to landform and vegetation cover from operation (taking account of established and matured planting, along with the proposed grassland forming a continuous sward beneath the modules and around the field margins).	

Environmental Aspect	Phase	Description of Effect	Likely Significant Effects
Landscape and Visual	Decommissioning	Impact on the landscape character within the Order limits, from a change of use of land use from an agricultural baseline to an active construction site (and therefore activity and machinery of a far greater scale than general farming) as well as the physical loss of landscape features such as riparian vegetation.	Likely significant adverse effects
		Impact on the village character of 4 of the 17 local village character areas, due to a change of land use from an agricultural baseline to an active construction site (and therefore activity and machinery of a far greater scale than general farming) as well as the physical loss of landscape features such as riparian vegetation.	
		Of the 17 local village character areas, impact on the village character of Fledborough due to a change of land use from an agricultural baseline to an active construction site (and therefore activity and machinery of a far greater scale than general farming) as well as the physical loss of landscape features such as riparian vegetation.	
		Impact to 10 of the 76 worst-case viewpoints considered, due to introduction of decommissioning activity.	
Carbon and Climate Change	Construction, operation and decommissioning	Whole lifecycle greenhouse gas emissions: contribution to climate change/ transition to net zero.	Likely significant beneficial effects
Human Health	Operation	Climate change mitigation and adaption: impacts of responding to the challenges of climate change.	Likely significant beneficial effects
		Wider societal infrastructure and resource: contribution towards energy infrastructure and impact on standard of living.	
Socio-economics	Construction and decomissioning	Employees on Site.	Likely significant beneficial effects

5.2 Biodiversity

Key Terms

Beetle banks	A permanent, raised and uncut grassy strip providing habitat that is beneficial for a range of fauna including certain types of insects and birds.
Biodiversity Net Gain (BNG)	BNG is a strategy to develop land contribute to the recovery of nature. It is a way for making sure the habitat for wildlife is in a better state than it was before development
Breeding Bird	Birds that nest within the area (usually between March and July).
Habitat connectivity	The degree to which separate patches of habitat are connected via similar / complimentary habitat types enabling genetic exchange and other crucial exchanges between local populations of flora and fauna.
Habitat piles	Piles of materials including dead wood that can be used by a range of species including reptiles, amphibians and invertebrates
Local Wildlife Site (LWS)	Non-statutory designations conferred by local planning authorities and given weight through local planning policy. These sites are selected through a selection of criteria (criteria are area dependent) aimed at identifying "substantive nature conservation value".
Modified grassland	Modified grassland receives frequent management inputs (e.g. fertiliser, pesticides, intensive grazing etc.) that limit species diversity and complexity of structure.
Other neutral grassland	Other neutral grassland supports species that grow well on neutral soils (i.e. not acidic or calcareous). This type of grassland typically has greater species diversity than modified grassland (such as intensively managed pasture).
Permanently wet ditch	Ditches that hold water for the majority of the time, often supporting a floral community that reflects the presence of water and its fluctuating nature.
Ramsar Site	Areas designated by the UK Government under the International Ramsar Convention (the Convention on Wetlands of International Importance) 1971.
Special Area of Conservation (SAC)	International designation implemented under the Habitats Regulations for the protection of habitats and (non-bird) species. Sites designated to protect habitats and species on Annexes I and II of the Habitats Directive. Sufficient habitat to maintain favourable conservation status of the particular feature in each member state needs to be identified and designated.
Sustainable drainage features	Natural approaches to managing drainage that are designed to mimic natural drainage and encourage infiltration, attenuation and passive treatment.
Wintering Bird	Birds that winter in the area, or pass through on passage, usually forming flocks outside of the breeding season.

What is the existing baseline?

5.2.1 The biodiversity baseline was established during a programme of desk study, consultation with stakeholders and field surveys. The Site is mainly comprised of arable land, with areas of improved grassland, neutral grassland, hedgerow, coastal and floodplain grazing march, permanently wet ditches, ponds, woodland and scrub. The River Trent directly bisects the Site. Surveys and desk studies identified protected species including reptiles, badgers, bats, breeding birds (including skylark), wintering birds, otter, water vole, reptiles, brown hare and hedgehog.

5.2.2 There are no statutory sites designated at the international level within the 10km study area. However, the Humber Estuary Ramsar site and Special Area of Conservation (SAC), which is located over 30km away, is directly linked to the Proposed Development through the River Trent. There are 34 Local Wildlife Sites (LWS) within 2km of the Site. Namely, the Fledborough to Hardy Dismantled Railway and Dunham Dubs, Dunham Oxbow, Darnsyke Marsh, and Fledborough Holme are within or adjacent to the Proposed Development.

What are the effects on Biodiversity and how are they avoided or managed?

5.2.3 The Proposed Development has been designed to minimise adverse environmental impacts while enhancing biodiversity. Avoidance and mitigation measures have been integrated through careful site selection, planning, and design, with the mitigation hierarchy guiding all future stages of the Proposed Development. These measures are secured through the **Commitments Register [EN010159/APP/7.15]**, and implemented via key documents, including the **Outline Design Parameters** (see **Volume 5, Reports and Statements [EN010159/APP/5.9]**), **outline Landscape Ecological Management Plan (oLEMP)** (see **Volume 7, Other Document [EN010159/APP/7.5]**, **oCEMP** (see **Volume 7, Other Document [EN010159/APP/7.4]**, and **Decommissioning Environmental Management Plan (oDEMP)** (see **Volume 7, Other Document [EN010159/APP/7.6]**, ensuring best practices across the design, construction, operation, and decommissioning phases.

Habitats

5.2.4 The River Trent will not be directly impacted by the Proposed Development and there will be no significant effects during construction and decommissioning phases due to measures detailed in the **oCEMP [EN010159/APP/7.4]** and **oDEMP [EN010159/APP/7.6]**, including the implementation of buffers (16m) and dust and pollution control. During operation, habitat creation and enhancement measures such as the creation of coastal and floodplain grazing marsh and permanent ditches as detailed in the **oLEMP [EN010159/APP/7.5]** will positively benefit the River Trent, however this will not be so significant as to affect the river as a whole.

5.2.5 The coastal and floodplain grazing marsh habitat adjacent to the River Trent will not be significantly affected during construction and decommissioning phases due to measures included in the **oCEMP [EN010159/APP/7.4]** and **oDEMP [EN010159/APP/7.6]**, including the implementation of buffers (5m) and dust and pollution control. During operation, there will be significant beneficial effects as the habitat will be managed to enhance its biodiversity value and new habitat will be created as detailed in the **oLEMP [EN010159/APP/7.5]**.

5.2.6 The Humber Estuary Ramsar Site and SAC is directly linked to the Proposed Development through the River Trent. River and sea lamprey are protected species which can be found migrating between different parts of the River Trent from the Humber Estuary. To avoid impacts on lamprey, trenchless cable installation (5m below the River Trent hard bed level), clear span bridges, and pollution control measures will be implemented as specified in the **oCEMP [EN010159/APP/7.4]**, **oDEMP [EN010159/APP/7.6]** and **oLEMP [EN010159/APP/7.5]**. Overall, there will be no significant effect of the Proposed Development on The Humber Estuary Ramsar Site and SAC.

5.2.7 The Proposed Development will not directly impact any LWS, including Fledborough to Harby Dismantled Railway LWS, Dunham Dubs, Dunham Oxbow, Darnsyke Marsh, and Fledborough Holme LWS. No land will be taken from these areas, and any effects will be indirect and temporary, limited to the construction and decommissioning phases. These effects will not be significant as they will be managed through the **oCEMP [EN010159/APP/7.4]** and **oDEMP [EN010159/APP/7.6]**, to implement buffers (5m), dust suppression measures, protective fencing and pollution controls. During operation, habitat creation and enhancement in neighbouring areas including hedgerows, scrub and species rich grassland as secured by the **oLEMP [EN010159/APP/7.5]** will positively benefit the LWS network in the medium to long term, however this will not be significant.

5.2.8 During construction 0.35km of hedgerow will be lost and approximately 250m will be managed to a height of 0.9m. To minimises losses, existing gaps and access points have been prioritised and a 5m buffer will be maintained around hedgerows as secured through the **oCEMP [EN010159/APP/7.4]**, **oDEMP [EN010159/APP/7.6]** and **oLEMP**. In addition, 14.06km of new species-rich native hedgerows will be planted and 58.88km of existing hedgerow will be enhanced. Therefore, while construction will have a low negative impact, the long-term ecological benefits of new hedgerow planting and habitat connectivity improvements will have a significant beneficial effect on hedgerow.

5.2.9 The Proposed Development will not directly impact any existing ponds or permanently wet ditches. Indirect effects during construction and decommissioning may occur. However, buffer zones (10m for ponds and variable for ditches) and pollution control measures will be implemented in the **oCEMP [EN010159/APP/7.4]** and **oDEMP [EN010159/APP/7.6]**. In addition, clear span bridges will be used to cross ditches and minimise shading. The project will introduce three new permanent ponds and 25 temporary ponds (scrapes). Additionally, 18.25 km of wet ditches will be actively managed, and a new permanently wet ditch will be created. These new and enhanced habitats secured in the **oLEMP [EN010159/APP/7.5]** will have a significant beneficial effect on ponds and permanently wet ditches and will improve habitat connectivity at a landscape scale.

5.2.10 The Proposed Development will result in the loss of 1.23ha of other neutral grassland. Indirect effects of construction activities relating to pollution will be prevented by adherence to the **oCEMP [EN010159/APP/7.4]**. 215.19ha of other neutral grassland will be created. Good condition modified grassland will also be created in fields containing solar PV panels (918.20 ha) and coastal and floodplain grazing marsh will be delivered through arable conversion (28.64 ha) and enhancement (3.93 ha). These new and enhanced habitats secured in the **oLEMP [EN010159/APP/7.5]** will have a significant beneficial effect on neutral grassland and will help increase habitat connectivity at a landscape scale.

Species

5.2.11 There will be no significant effects on badgers as setts identified within the site have been avoided in the design. Temporary disturbances may occur during construction and decommissioning, however, effects are minimised through working hours, pre-construction surveys, buffers and protective fencing as secured in the **oCEMP [EN010159/APP/7.4]** and **oDEMP [EN010159/APP/7.6]**. Creation of habitats including species rich grassland, hedgerows, trees and beetle banks as secured in the **oLEMP [EN010159/APP/7.5]** will provide better foraging opportunities for badgers however the effect is not predicted to be significant.

5.2.12 Land take from habitats that are important to bats (hedgerows, tree lines and woodland edges) has been avoided as far as possible in the design of the Proposed Development. Temporary disturbances may occur during construction and decommissioning, however effects are minimised through working hours, pre-construction surveys and buffers as secured in the **oCEMP [EN010159/APP/7.4]** and **oDEMP [EN010159/APP/7.6]**. During operation, evidence suggests there will be minimal disturbance to bats and the creation of new hedgerows, field margins, extensive grassland, ponds and scrapes, as secured in the **oLEMP [EN010159/APP/7.5]** will provide additional habitats for bats. The overall effect of the Proposed Development on bats is however assessed as not significant due to uncertainty about the potential for solar farms to reduce bat activity above the panels.

5.2.13 Temporary disturbances and habitat loss during construction and decommissioning may cause some displacement to birds, particularly to Skylarks as they nest in open fields. However, these effects will be minimised through the implementation of buffer zones, pollution controls and retention of hedgerows, trees and wetland areas as secured in the **oCEMP [EN010159/APP/7.4]** and **oDEMP [EN010159/APP/7.6]**. During operation 243.83 ha of species-rich grassland will be created as secured by the **oLEMP [EN010159/APP/7.5]**, with 86 ha specifically managed for skylarks, including 258 skylark plots to support breeding pairs. However, the overall effect on skylark is assessed as not significant. Nesting and feeding opportunities for other breeding birds will increase with the provision of 14.06 km of new hedgerows and 58.88 km of enhanced hedgerows as secured by the **oLEMP [EN010159/APP/7.5]**. In addition, the creation of species-rich field margins, beetle banks, and temporary ponds and scrapes and sustainable drainage features will further enhance habitat diversity for breeding birds. The overall effect on other breeding birds is significant beneficial. For wintering birds, while some farmland species may experience habitat loss, the creation of species-rich grassland and coastal and floodplain grazing marsh as secured by the **oLEMP [EN010159/APP/7.5]** will provide alternative foraging areas. The overall effect on wintering birds is assessed as not significant.

Species

5.2.14 Otter and water voles using permanent wet ditches and watercourses in the Site may be disturbed during construction and decommissioning, however effects are minimised through buffer zones and the use of clear span bridges to cross ditches as secured in the **oCEMP [EN010159/APP/7.4]** and **oDEMP [EN010159/APP/7.6]**. Some habitat loss may occur, but this will be minimal and as a result of the clear span bridges (9 bridges of 6 meters wide). 17.32km of permanent wet ditches will be managed and an additional 100m new wet ditch created as secured in the **oLEMP [EN010159/APP/7.5]**. Additionally, mink, a non-native predator of water voles will be controlled, and artificial otter holts will be constructed to encourage otter breeding. The habitat creation and enhancement measures will help conserve otter and water vole populations and increase habitat connectivity at a landscape scale. The overall effect will be beneficial for both species, though only significantly beneficial for water voles.

5.2.15 Reptiles such as grass snake and common lizard may be injured or killed during construction. However, vegetation clearance will be monitored by an Ecological Clerk of Works (ECoW) to avoid this, as secured in the **oCEMP [EN010159/APP/7.4]**. Habitat creation and enhancement measured secured in the **oLEMP [EN010159/APP/7.5]** such as hedgerow and treeline planting and enhancement, field margins, beetle banks, temporary pools and scrapes, sustainable drainage features and habitat piles will benefit reptiles. The overall effect is predicted to be significant beneficial.

5.2.16 Temporary disturbances to brown hare and hedgehog may occur during construction and decommissioning, however effects are minimised through working hours and localised construction as secured in the **oCEMP [EN010159/APP/7.4]** and **oDEMP [EN010159/APP/7.6]**. The creation of new hedgerows, field margins, extensive grassland, ponds and scrapes, beetle banks, and sustainable drainage features as secured in the **oLEMP [EN010159/APP/7.5]** will provide additional habitats for brown hares and hedgehogs. The overall effect of the Proposed Development is assessed as significant beneficial for both species.

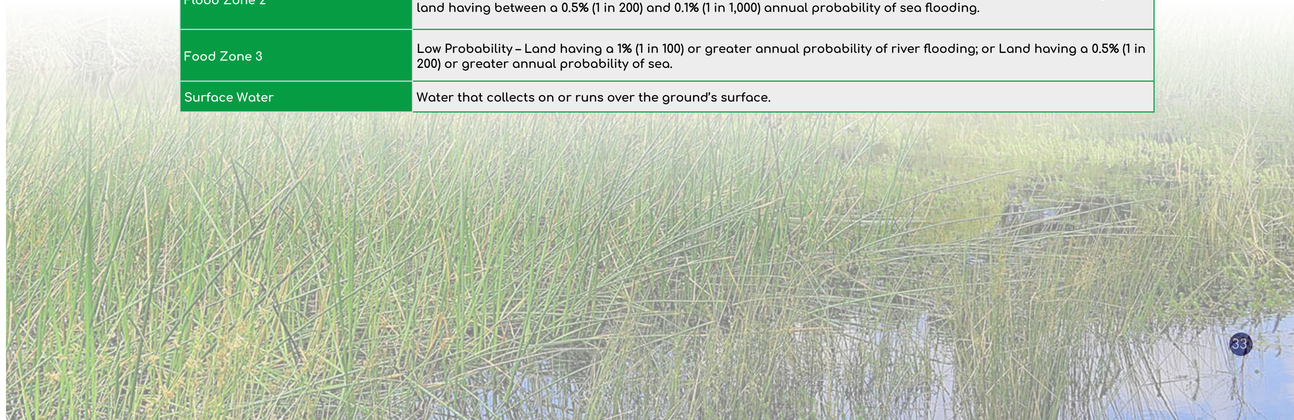
Summary

5.2.17 Overall, while some temporary negative effects will occur during construction and decommissioning, these effects area managed through the **oCEMP [EN010159/APP/7.4]** and **oDEMP [EN010159/APP/7.6]**. Habitat creation and enhancement measures as secured by the **oLEMP [EN010159/APP/7.5]** will result in significant long-term ecological benefits to many habitats including coastal and floodplain grazing marsh, hedgerows, ponds and permanently wet ditches and grasslands. There will be significant beneficial effects to species including water vole, breeding birds, reptiles, brown hare and hedgehog.

5.3 Hydrology

Key Terms

Groundwater	Water held below the ground's surface in the spaces in soils, superficial deposits and bedrock.
Groundwater Vulnerability	The vulnerability of groundwater to a pollutant discharged at ground level based on hydrological, geological, hydrogeological and soil properties.
Floodplain	An area of low-lying land located adjacent to a watercourse or surface waterbody that is susceptible to flooding.
Flood Risk	A combination of the likelihood of a flood event occurring and the consequences / impact of that event.
Flood Zone 1	Low Probability – Land having a less that 0.1% (1 in 1,000) annual probability of river or sea flooding
Flood Zone 2	Medium Probability – Land having between a 1% (1 in 100) and 0.1% (1 in 1,000) annual probability of river flooding; or land having between a 0.5% (1 in 200) and 0.1% (1 in 1,000) annual probability of sea flooding.
Food Zone 3	Low Probability – Land having a 1% (1 in 100) or greater annual probability of river flooding; or Land having a 0.5% (1 in 200) or greater annual probability of sea.
Surface Water	Water that collects on or runs over the ground's surface.



What is the existing baseline?

5.3.1 The existing baseline was obtained using publicly available data, site walkovers and hydraulic modelling (provided by the Environment Agency). The River Trent flows through the Site, along with a number of ordinary watercourses and ditches.

5.3.2 Flood risk predominantly originates from the River Trent which is fluvially dominated (mainly affected by rainfall rather than tides) at the Sites location. There are a number of Environment Agency flood defences along the River Trent banks which provide a varying level of protection to the surrounding areas from flooding. Large areas around the Grid Connection point are in flood risk areas, and therefore a large proportion of the Site falls within Flood Zones 2 and 3, indicating medium to high probability of flooding from rivers.

5.3.3 The majority of the Site is at very low risk of flooding from surface water. There are however some localised areas within the Site which are shown to be at low, medium and high risk. Flood depths in these locations are generally less than 300mm with depths of 600mm in localised areas. Groundwater vulnerability varies, with some areas highly susceptible to pollution.

What are the effects on Hydrology and how are they avoided or managed?

5.3.4 While it was not possible to avoid flood risk during Site Selection, as large areas around the Grid Connection point are in flood risk areas, a Sequential Test was applied (see **Site Selection Report, Appendix 1 of the Planning Statement [EN010159/APP/5.5]**).

5.3.5 The assessment undertaken concludes that during construction there are no significant effects as changes to surface water drainage and flood risk are temporary and negligible due to adherence of mitigation set out within the **oCEMP [EN010159/APP/7.4]**.

5.3.6 The Flood Risk Assessment confirms that once operational, there will be no increase in flood risk from any source due to embedded environmental measures. Sensitive equipment such as the substations and BESS infrastructure are located away from flooding, and there will be no built development, including solar PV panels, within Flood Zone 3b (the functional floodplain).

5.3.7 Where solar panels are to be located within the design flood extent, they will in general be raised above the predicted flood level. This is achieved by raising the base of the solar PV panels to a maximum of 1.8m above ground level. There is a small portion of the solar panels that would experience flooding at their base. The flood depths however will be limited, and the operational impact should this occur is considered to be acceptable. Where inverters are located within the design flood extent, these will be raised above the predicted flood level. Furthermore, there will be no land raising as part of the proposals and the assessment confirmed that will be no loss in floodplain storage.

5.3.8 The mitigation set out above also provides mitigation from surface water flood risk. Appropriate offsets from watercourses, flood defences, watermains and drainage infrastructure have been provided to ensure that access for maintenance and impacts to them are mitigated. Rainfall from the solar panels themselves will simply drain to ground, mimicking the natural scenario and will not result in any significant increase in runoff. Rainfall landing on areas of hardstanding (i.e. BESS and substation areas) will be contained and directed to the surrounding watercourses at a rate that matches the natural situation. The drainage strategy set out includes for various Sustainable Drainage Systems to manage rainfall and allowances for climate change have been included. Furthermore, appropriate treatment has been provided within the design to ensure that the quality of rainfall leaving the Site and entering the watercourses is acceptable.

5.3.9 With the above in mind and environmental measures implemented, it is concluded that the effect to all receptors during operation will not be significant. The decommissioning effects are considered to be the same as for the construction stage i.e. temporary and of negligible non-significant effect.

5.4 Land and Soils

Key Terms

Agricultural Land Classification (ALC)	A framework for classifying land according to the extent to which its physical or chemical characteristics impose long-term limitations on agricultural use. The ALC system divides agricultural land into 5 grades (Grade 1 'Excellent' to Grade 5 'Very Poor'), with Grade 3 subdivided into Subgrade 3a 'Good' and Subgrade 3b 'Moderate'.
Best and Most Versatile (BMV) Land	The BMV land is considered to be the most flexible, productive and efficient in response to inputs and which can best deliver future crops for food and non-food uses (such as biomass, fibres and pharmaceuticals). Agricultural land classified as Grade 1, 2 and Subgrade 3a falls in the 'best and most versatile' (BMV) category in the National Planning Policy Framework (NPPF) revised in December 2024.
Groundwater	All water which is below the surface of the ground in the saturation zone and in direct contact with the ground or subsoil (legal definition as referenced on gov.uk website).
High sensitivity soils	Soils and agricultural land classified by the ALC system (above) as Grade 3a
Medium sensitivity soils	Soils and agricultural land classified by the ALC system (above) as Grade 3b.
Source Protection Zones	Zones which show the level of risk to a source of groundwater from contamination.
Very high sensitivity soils	Soils and agricultural land classified by the ALC system (above) as Grade 2.

What is the existing baseline?

5.4.1 The existing baseline for land and soils was determined using online mapping, publicly available data, and soil sampling. The Site has a history of agricultural use with minor industrial activity and is now predominantly agricultural land. Large areas around the Grid Connection Point are classified as Best and Most Versatile (BMV) land (Grades 2 and 3a). The Site was selected to avoid BMV land as far as possible, however 53.3% of the surveyed land within the Site (46.9% of the whole Site) falls under this classification. The Site features secondary aquifers with Mercia Mudstone bedrock, sand, gravel, and clay deposits, and includes groundwater abstraction points for agricultural use, with no Source Protection Zones (SPZs).

What are the effects on Land and Soils and how are they avoided or managed?

5.4.2 Construction effects on land, soil, and groundwater are assessed as generally slight adverse and non-significant, as they are temporary, localised, and mitigated through effective management plans. Construction effects on very high and high sensitivity soils are also not significant due to soil management measures.

5.4.3 During operation, soil quality benefits significantly for very high sensitivity soils, while the effect on high and medium sensitivity soils is beneficial but not significant. This is because land beneath the solar panels will be converted to grassland, improving soil structure and increasing organic content over time. However, the long-term reduction in agricultural land availability results in a moderate adverse and significant effect.

5.4.4 Decommissioning effects are similar to construction, with negligible to slight adverse effects on soils and agricultural land, which remain not significant. An oCEMP [EN010159/APP/7.4], outline Soil Management Plan (oSMP) (see Volume 7, Other Documents [EN010159/APP/7.10]) and oDEMP [EN010159/APP/7.6] were prepared to manage and minimise land and soil effects. Mitigation measures include controlled excavation, temporary storage of topsoil in bunds, minimising soil trafficking during wet conditions, and phased reinstatement of agricultural land where appropriate.

5.4.5 It is noted that at the time of the statutory consultation from 29th May to 9th July, we presented our preliminary assessment on the likely significant effects to agricultural land. At that point in time, we anticipated there would be no likely significant effects. That preliminary assessment was based on the information available at the time, and as noted in the PEIR, Agricultural Land Classification (ALC) surveys were ongoing. Those surveys have now been completed and as noted in the PEIR, we are now able to report on likely significant effects based on a full assessment. The nature and the impact on this soil resource that we consulted in the PEIR on has not changed, however, the survey results have shown a slight increase in high sensitivity soils which has resulted in the significance of the effect increasing so that it's now reported as a significant effect.

5.5 Buried Heritage

Key Terms

Areas of Archaeological Constraint (AAC)	A defined zone identified to protect significant archaeological remains from potential impacts during construction, development, or other land-use activities related to the Proposed Development. These areas are established based on archaeological assessments and are expected to require special environmental and/or archaeological mitigation measures to minimise the impact on Buried Heritage assets.
Buried Heritage assets	Heritage assets, including both Designated Heritage Assets and Non-Designated Heritage Assets (as defined above), that comprise buried remains (i.e. exist below present ground level).
Designated Heritage Assets	Designated heritage assets are defined in Overarching National Policy Statement for Energy EN-1 ('NPS EN-1', Department for Energy Security and Net Zero, November 2023) as 'Some heritage assets have a level of significance that justifies official designation. Categories of designated heritage assets are World Heritage Sites, Scheduled Monuments, Protected Wreck Sites, Protected Military Remains, Listed Buildings, Registered Parks and Gardens, Registered Battlefields, Conservation Areas, Registered Historic Landscapes (Wales only)' (paragraph 5.9.4). There are heritage assets that are not currently designated, but which have been demonstrated to be of equivalent significance to designated heritage assets of the highest significance.
Geophysical Survey	A geophysical survey is a non-invasive method used to detect potential archaeological features beneath the ground. This technique does not involve excavation or any intrusive activities. It is typically conducted before test trenching to identify the potential locations and extent of archaeological features on larger sites.
Non-Designated Heritage Assets	Non-designated heritage assets are defined in Planning Practice Guidance (2019) as: 'Non-designated heritage assets are buildings, monuments, sites, places, areas or landscapes identified by plan-making bodies as having a degree of heritage significance meriting consideration in planning decisions, but which do not meet the criteria for designated heritage assets' (paragraph 39). In line with NPS EN-1, non-designated heritage assets have significance that merits consideration, even though those assets are of lesser significance than designated heritage assets (paragraph 5.9.7).

One Earth Solar Farm
Environmental Statement Volume 3: Non Technical Summary

What is the existing baseline?

5.5.1 The Buried Heritage baseline been informed by a desk-based assessment, which was informed by a review of the data collected from various sources. In addition a robust programme of survey and archaeologilcal evaluation was carried out which included non-intrusive geophysical survey, a geoarchaeological borehole survey with deposit modelling, and intrusive archaeological evaluation via trial trenching.

5.5.2 To inform the baseline, two study areas have been identified: a 2km radius from the Order Limits and its connection routes for Non-Designated Heritage Assets, and a 5km radius for Designated Heritage Assets, such as Scheduled Monuments.

5.5.3 The Scheduled Monument of Whimpton Moor Medieval Village and Moated Site is partially located within the Order Limits but largely excluded from the developable area. There are 3 further Scheduled Monuments within the 2km study area (outside of the Proposed Development). Additional Non-Designated Buried Heritage Assets, such as medieval villages, areas of potential Prehistoric and Roman settlement, Roman road, and ridge and furrow cultivation patterns are recorded within the 2km study area. There are three further Scheduled Monuments within the 5 km Study Area, but outside of the 2 km Study Area.

What are the effects on Buried Heritage and how are they avoided or managed?

5.5.4 During the construction phase, there may be localised and direct effects from excavation, piling and other construction activities that could lead to loss of buried heritage assets. However, the information collected to inform the ES confirmed that any effect arising from the construction of the Proposed Development on buried heritage assets can be successfully mitigated to a non-significant level by a combination of embedded environmental measures and a proportionate and targeted archaeological mitigation.

5.5.5 The design has been carefully planned to minimise effects on known and unknown buried heritage assets, incorporating a number of environmental measures, including setbacks around Scheduled Monuments and villages.

5.5.6 Areas of high archaeological sensitivity (Areas of Archaeological Constraint, AAC) will be identified pre-construction in consultation with the relevant Local Planning Authorities and Historic England. In these areas, solar PV panel supports will be carefully placed or will use concrete footings, and fencing will be installed to avoid disturbing archaeological features. An Archaeological Clerk of Works (ACoW) will oversee compliance.

5.5.7 The approach to the archaeological mitigation will be provided within an **Archaeology Mitigation Strategy (AMS)** which will be secured by a DCO Requirement in accordance with policy. The AMS sets out the objectives for the archaeological mitigation and the mechanisms to design and program the fieldwork, undertake evaluation, mitigation, analysis, reporting and archiving. The AMS will also include a protocol for dealing with unexpected archaeological discoveries during construction. All archaeological mitigation works will be undertaken by an appropriately experienced and competent archaeological contractor in accordance with a Written Scheme of Investigation that will be agreed with the Archaeological Advisors to Lincolnshire County Council, Nottinghamshire County Council, and Historic England and approved in writing prior to commencement of construction.

5.5.8 Along with the AMS, the other management plans including the **oCEMP [EN010159/APP/7.4]**, **oOEMP [EN010159/APP/7.5]**, **oDEMP [EN010159/APP/7.6]** and **oLEMP [EN010159/APP/7.5]** will also be implemented to mitigated effects on buried heritage assets. Measures include appropriate setbacks and buffer areas, the use of gravel and track matts for heavy machinery, use of trenchless crossings rather than open cut trenching for the avoidance/preservation of buried heritage deposits and avoiding surface water run-off.

5.5.9 With all the above measures implemented, there will be no significant effects arising from the construction of the Proposed Development.

5.5.10 No significant effects were identified for the operational or decommissioning phases. Further evaluation may be required for areas of potential heritage deposits, but this should be undertaken pre-construction to minimise harm.

5.6 Cultural Heritage

Key Terms

Designated Heritage Assets	Designated heritage assets are defined in Overarching National Policy Statement for Energy EN-1 ('NPS EN-1', Department for Energy Security and Net Zero, November 2023) as 'Some heritage assets have a level of significance that justifies official designation. Categories of designated heritage assets are World Heritage Sites, Scheduled Monuments, Protected Wreck Sites, Protected Military Remains, Listed Buildings, Registered Parks and Gardens, Registered Battlefields, Conservation Areas, Registered Historic Landscapes (Wales only)' (paragraph 5.9.4). There are heritage assets that are not currently designated, but which have been demonstrated to be of equivalent significance to designated heritage assets of the highest significance.
Non-designated heritage	Non-designated heritage assets are defined in Planning Practice Guidance (2019) as: 'Non-designated heritage assets are buildings, monuments, sites, places, areas or landscapes identified by plan-making bodies as having a degree of heritage significance meriting consideration in planning decisions, but which do not meet the criteria for designated heritage assets' (paragraph 39). In line with NPS EN-1, non-designated heritage assets have significance that merits consideration, even though those assets are of lesser significance than designated heritage assets (paragraph 5.9.7).
Setting	The setting of a heritage asset is defined in NPS EN-1 as 'The setting of a heritage asset is the surroundings in which it is experienced. Its extent is not fixed and may change as the asset and its surroundings evolve. Elements of a setting may make a positive or negative contribution to the significance of an asset and may affect the ability to appreciate that significance or may be neutral...'.

One Earth Solar Farm
Environmental Statement Volume 3: Non Technical Summary

What is the existing baseline?

5.6.1 TThe cultural heritage baseline was obtained by fieldwork, surveys, mapping, GIS data analysis and desk-based assessments. The cultural heritage baseline seeks to identify relevant heritage assets and understand their value in heritage terms.

5.6.2 The Scheduled Monument Whimpton Moor Medieval Village and Moated Site is partially located within the Site but is largely excluded from the developable area. The wider study area (a 2km radius outside of the Proposed Development) includes three further Scheduled Monuments, two Conservation Areas (South Clifton and East Drayton), four Grade I listed buildings, seven Grade II* listed buildings, and 78 Grade II listed buildings. There are 81 non-designated heritage assets within a 1km radius of the Proposed Development; a smaller study area was considered appropriate for non-designated assets and agreed during consultation.

5.6.3 The heritage assets which have been assessed are those agreed during extensive consultation with local conservation advisors and Historic England; this includes heritage assets in Darlton, Dunham, East Drayton, Fledborough, High Marnham, Low Marnham, Newton on Trent, Normanton on Trent, North Clifton, Ragnall, Skegby, South Clifton and Thorney.

What are the effects on Cultural Heritage and how are they avoided or managed?

5.6.4 During the construction phase, significant adverse effects due to noise, dust, traffic and visual intrusion from construction activities are expected for assets within closer proximity of the Order Limits, this includes the Scheduled Monuments of Whimpton Moor Medieval Village and the Roman Vexillation Fortress, (Scheduled Monument), several listed buildings in Ragnall, Fledborough, and Skegby. There will be no significant effects on heritage assets further from the Site, as these will be mitigated by setbacks, vegetation screening and site-specific measures. These effects would be temporary and reversible.

5.6.5 During the operational phase, significant short- and medium-term adverse effects are expected for designated assets in Ragnall, which will be mitigated over time as the proposed planting of native trees and hedgerows establishes, reducing visibility of the Proposed Development and screening some views. Long- term significant adverse effects would be limited to Whimpton Moor Medieval Village and attempts have been made to further mitigate these effects through design changes such as setbacks, landscape buffers and removal of the developable area nearby. There would be no significant effects to any other heritage assets, and this is considered to be a result of an engaged consultation process and good design to mitigate effects where possible. Other designated and non-designated assets and within and near the Site would experience minor or negligible adverse effects which would not be considered significant but would still be considered harmful. For any harmful effects arising (significant or not significant), these would need to be weighed against the public benefits of the Proposed Development.

5.6.6 During the decommissioning phase, effects will be similar to construction with adverse significant effects localised to sensitive areas for a temporary period. Decommissioning would return the Site to a near original state, removing operational-phase effects. For the construction and decommissioning phases, an **oCEMP [EN010159/APP/7.4]** and **oDEMP [EN010159/APP/7.6]** were prepared to control noise, dust and lighting effects amongst others.

5.7 Landscape and Visual

Key Terms

Landscape	Defined by the European Landscape Convention as "an area, as perceived by people, whose character is the result of the action and interaction of natural and/or human factors".
Landscape Character Area	A distinct, recognisable and consistent pattern of elements in the landscape that makes one landscape different from another, rather than better or worse.
Landscape Receptor	Defined aspects of the landscape resource that have the potential to be affected by a proposal.
Permissive Path	A permissive path is a route that a private landowner has voluntarily opened up to the public, to enable them to cross his or her land.
Viewpoint	Representative and typical views experienced by visual receptors obtained from publicly accessible locations.
Visual Receptor	Individuals and/or defined groups of people who have the potential to be affected by a proposal.
Zone of Theoretical Visibility	Computer generated mapping which illustrates the theoretical visibility of an object in relation to a person standing anywhere within the Study Area (i.e. both publicly accessible and non-publicly accessible locations). The modelling is used to inform the scope of the assessment. 'Bare-earth' ZTV refers to when the computer model is based only upon an object and landform, thereby omitting existing vegetation and buildings.

What is the existing baseline?

5.7.1 The landscape and visual baseline were identified through a combination of desk-based assessments and fieldwork. This included an analysis of published landscape character assessments, aerial photography, and mapping data. The study area is predominantly flat arable farmland with gentle variations in elevation. It features fields of different sizes, hedgerows, small woodlands, and scattered settlements. Key infrastructure includes electricity pylons and overhead wires extending across the southwest, a substation, roads, and a dismantled railway line. There is also an extensive network of PRoW, including long-distance walking and cycling routes. There are no statutory or local landscape designations within the study area. There are several published landscape character areas in the study area including Trent and Belvoir Vales, as well as Trent Washlands, Mid-Nottinghamshire Farmlands and East Nottinghamshire Sandlands.

5.7.2 Landscape receptors were identified using published landscape character assessments, which define 17 distinct character areas, types, or Policy Zones. To refine this further at a local level, a Local Village Character Assessment (LVCA) was conducted, assessing 17 villages and their immediate settings.

5.7.3 Visual receptors were identified were identified through Zone of Theoretical Visibility (ZTV) mapping, online mapping, fieldwork, and community consultations. These receptors include residents, recreational users on PRoW including promoted routes, road users, and people on the River Trent. 76 representative viewpoints were established to assess potential visual effects, with findings indicating that views across the area are generally open and expansive. The final list of landscape and visual receptors was agreed upon in consultation with host authorities.

What are the effects on Landscape and Visual and how are they avoided or managed?

5.7.4 The Proposed Development has been designed through an iterative process, to mitigate potential adverse effects on landscape character and visual amenity, and to maximise associated benefits. The **Design Approach Document** (see **Volume 5: Reports and Statements [EN010159/APP/5.8]**) outlines this process.

5.7.5 The design minimises landscape and visual impacts by integrating infrastructure within existing vegetation, maintaining setbacks from villages and heritage assets, and excluding floodplain areas. Natural landforms are used to screen views, with the eastern substation placed on lower ground and ridgelines shielding solar panels from residential properties.

5.7.6 The design provides opportunities for enhancement across the Site, including planting of including meadows, grasslands, hedgerows, and tree belts, which will integrate the development into the landscape and enhance biodiversity. Key views from residential areas are protected with residential offsets and a 700m-wide corridor towards Fledborough Viaduct, while existing hedgerows will be retained and improved.

5.7.7 PRoW including the Trent Valley Way and National Cycle Route 647, will be safeguarded and expanded, with new permissive paths improving access and equestrian routes will have enhanced clearances and screening. Infrastructure design limits visual impact with underground cabling, minimal lighting, and discreet fencing, using infrared and motion-activated lights only when necessary. Vegetation loss has been minimised, with buffer zones established around hedgerows, woodlands, and water features. Where clearance is necessary, vegetation will be coppiced rather than removed.

5.7.8 These design and mitigation measures ensure the development is sensitively integrated into the landscape, reducing long-term visual impacts while enhancing biodiversity and recreational access. The measures are secured through the **Commitments Register [EN010159/APP/7.15]**, including the **Outline Design Parameters [EN010159/APP/5.9]**, **Vegetation Removal Plan** (see **Volume 2, Plans/ Drawings/ Sections [EN010159/APP/2.8])**, **oLEMP [EN010159/APP/7.5]**, **oCEMP [EN010159/APP/7.4]**, and **oDEMP [EN010159/APP/7.6]** to ensure implementation at every project stage.

5.7.9 During construction there will be temporary changes to the landscape. Land disturbance, including topsoil stripping and some vegetation removal, will result in major significant adverse effects on the landscape character of the Proposed Development. There will also be a mix moderate and major significant adverse effects on five of the 17 published character areas and four of the 17 LVCAs.

5.7.10 In terms of visual impact, construction activities will be most noticeable to those people in close proximity to the Proposed Development, including residents, and road and PRoW users. A mix of moderate and major significant adverse effects are expected in 29 of 76 of the representative viewpoints from areas such as Ragnall, Skegby, and North Clifton, as well as at key viewpoints along the Trent Valley Way, A1133, and National Cycle Route 647. While these impacts will be temporary, this phase represents the most visually intrusive stage of the project.

5.7.11 During the first year of operation there will be noticeable changes to the arable land use to an operational solar farm, with immature mitigation planting providing limited integration with the existing landscape. This will result in major significant adverse effects on the landscape character of the Order Limits. There will also be a mix moderate and major significant adverse effects on four of the 17 published character areas and two of the 17 LVCAs.

One Earth Solar Farm
Environmental Statement Volume 3: Non Technical Summary

5.7.12 In terms of visual impact at year 1, there will be views of above ground structures of the Proposed Development including the substation, BESS and solar arrays. Although setbacks and buffers will help reduce visibility, newly planted vegetation will be yet to establish and mature so there will be limited additional screening. A mix of moderate and major significant adverse effects are expected in 18 of 76 of the representative viewpoints from areas such as along the PRoW network that pass adjacent to or through the Order Limits, short sections of the local road network, as well as residents of isolated farmsteads to the east of the A1133.

5.7.13 However, by year 15 of operation mitigation planting, including hedgerows and trees, will have matured significantly, providing opportunities for biodiversity and habitat connectivity, as well as helping to visually integrate the Proposed Development infrastructure into the landscape. This will result in major significant adverse effects on the landscape character of the Order Limits. There will also be a mix moderate and major significant adverse effects on two of the 17 published character areas and two of the 17 LVCAs.

5.7.14 Similar to year 1 of the operation phase, visual effects by year 15 of operation would arise from views of above ground structures of the Proposed Development. However, mitigation planting would have established and matured so that the extent over which the Proposed Development would be experienced would be further reduced. A mix of moderate and major significant adverse effects adverse effects are expected in 11 of 76 of the representative viewpoints and will be largely confined to areas within or immediately adjacent to the Proposed Development, particularly for users of nearby PRoWs, local road networks, and residents of isolated farmsteads east of the A1133. Despite the screening improvements, significant adverse effects will persist in key areas where views remain unobstructed due to proximity and landscape context. Many of the views demonstrate worst-case scenarios for example, for a relatively short stretch of the PRoW where it intersects the Order Limits or as fleeting views along a road, rather than for the entire length of their respective routes. Existing and proposed vegetation would provide varying levels of screening and filtering when experiencing these views in the field such that no significant effects are predicted beyond approximately 200m of the Order Limits.

5.7.15 Decommissioning will cause significant landscape and visual effects similar to construction, however these effects are temporary and localised. Retained mature planting from the operational phase will help screen activities, reducing effects for residents and PRoW users. Restoration of the Site to its pre-development or improved state ensures long-term effects are mitigated.

5.8 Transport and Access

Key Terms

Heavy Goods Vehicle (HGV)	A vehicle that is used to transport goods and materials and has a gross combination mass of more than 3,500 kg
Traffic flows	The flow of traffic from one point to another.

What is the existing baseline?

5.8.1 New traffic survey data was collected along with existing traffic statistics, road accident data and a study area walk over to establish the existing traffic baseline. The Site includes several PRoW, with a mix of footpaths, bridleways, and other routes passing through or near the development. The area is connected by the A57, A1133, and minor rural roads, which have varying capacities to accommodate Heavy Goods Vehicle (HGV) traffic.

What are the Transport and Access effects and how are they avoided or managed?

5.8.2 The construction traffic would result in a temporary increase in traffic flows on the road network surrounding the Proposed Development, however the effects is short term and not considered to be significant. No assessment of operational effects has been undertaken, given the low level of traffic associated with this phase. Decommissioning effects are expected to be similar or less than those associated with the construction phase.

5.8.3 A comprehensive outline **Construction Traffic Management Plan (oCTMP)** (see **Volume 7: Other Documents [EN010159/APP/7.9]**) have been proposed to mitigate and offset the effects of the construction phase. The **oCTMP [EN010159/APP/7.9]** sets out measures for safe and controlled construction traffic movements, including designated access routes, timing restrictions, and road safety provisions, and will be secured through the DCO. A future **Decommissioning Traffic Management Plan (DTMP)** will be produced prior to the site being decommissioned and restored. The **DTMP**, will build upon the principles of the **oCTMP [EN010159/APP/7.9]**, incorporating updated best practices. With these measures in place, there will be no significant effects relating to Transport and Access.

5.9 Air Quality

Key Terms

Air Quality Management Area (AQMA)	An area where the local air quality is unlikely to meet the Government's national air quality objectives. Each local authority in the UK is required to review and assess the air quality within their area. If the air quality in an area exceeds the limits set by the government, the local authority must declare an Air Quality Management Area (AQMA). Once an AQMA has been declared, the local authority must carry out further work to monitor the air quality in the area and identify what action can be taken to improve it.
Standards	A nationally defined set of concentrations for nine pollutants below which health effects do not occur or are minimal.

What is the existing baseline?

5.9.1 The existing baseline for air quality was evaluated using data from publicly available sources. Air quality objectives are expected to be met across the entire Site, with no sensitive locations at risk of exceeding the relevant objectives. There are no Air Quality Management Areas (AQMAs) within the Study Area. The nearest AQMA is located in Lincoln City Centre, approximately 11.1km east of the Proposed Development Site boundary. Residential properties near the Site are identified as high-sensitivity receptors to dust and pollutants.

What are the Air Quality effects and how are they avoided or managed?

5.9.2 The air quality assessment showed that the effects of emissions resulting from construction traffic are judged to be not significant, as the pollutant concentrations were below the relevant air quality objectives and the changes in concentrations were small at all sensitive locations during construction. There is high potential for dust generation from earthworks, construction and vehicle movement during construction, but measures to minimise dust generation and prevent off-site effects will be implemented through the **oCEMP [EN010159/APP/7.4]** and **Dust Management Plan (DMP)** (see **Volume 7: Other Documents [EN010159/APP/7.10]**)will ensure the effects are not significant. These include water spraying to suppress dust, covering stockpiles, managing vehicle movements, and using designated haul routes. Regular monitoring will ensure compliance, and local communities will be kept informed of dust-generating activities.

5.9.3 No significant air quality effects are expected during normal operation due to the solar farm's design and lack of substantial vehicle or industrial activity. While no specific additional mitigation is required for air quality during operation, the outline **Operational Environmental Management Plan (oOEMP)** (see **Volume 7: Other Documents [EN010159/APP/7.5]**) includes measures to ensure minimal emissions from occasional maintenance activities. During the decommissioning phase the air quality effects are expected to be similar to construction, and with proper mitigation are expected to be not significant. The **oDEMP [EN010159/APP/7.6]** will include measures to minimise dust and emissions, similar to those used during construction.

5.10 Carbon and Climate Change

Key Terms

Climate Change Resilience (CCR) Assessment	The CCR assessment evaluates the project's resilience to future climate changes.
CO2e	Carbon dioxide equivalent is a standard unit used to measure and compare the impact of different greenhouse gases on global warming. It expresses the effect of various gases in terms of the amount of carbon dioxide that would have the same global warming potential (GWP).
Greenhouse Gas (GHG)	A greenhouse gas is a gas which is present in the Earth's atmosphere and released through anthropogenic activities, within the atmosphere they absorb and emit infrared radiation, contributing to global warming.
Greenhouse Gas (GHG) Assessment	The GHG assessment considers the net GHG emissions resulting from the Proposed Development.
In-Combination Climate Change Impact (ICCI) Assessment	The ICCI assessment examines how climate change may alter environmental effects like flood risk, air quality, and noise

What is the existing baseline?

5.10.1 The carbon and climate change baseline was established using publicly available environmental and climate data, combined with site-specific assessments of agricultural emissions and typical UK climate conditions. The existing baseline primarily consists of agricultural land and part semi-natural habitat, with GHG emissions from current farming practices estimated at 450 tonnes CO2 or equivalent (e) annually. The Site experiences typical UK climate including risks from hotter summers, wetter winters and increased storm activity. At baseline level the existing environmental receptors experience typical climate influences without notable synergistic effects.

What are the Carbon and Climate change effects how are they avoided or managed?

5.10.2 The Carbon and Climate Change assessment includes three parts: Greenhouse Gas (GHG) Assessment, Climate Change Resilience (CCR) Assessment, and In-Combination Climate Change Impact (ICCI) Assessment.

5.10.3 The GHG Assessment found that while the Proposed Development will generate minimal (virtually zero) carbon emissions during operation, there are indirect carbon emissions associated with construction and the maintenance of the Proposed Development which are primarily a result of manufacture and transport of products and components used in the Proposed Development (e.g. solar panels and batteries). However, it will avoid far greater emissions by replacing energy generated by fossil fuels with renewable energy. Over the 60-year lifetime of the Proposed Development is has been calculated that reliance on fossil fuels would generate approximately 2.1 million tonnes of CO2e more than the Proposed Development. This includes an assumption that fossil fuel power will be upgraded to include carbon capture in the future, greatly reducing its emissions. By avoiding these emissions, the Proposed Development will contribute to substantial long-term carbon savings and therefore there is a significant beneficial effect relating to GHG emissions.

5.10.4 The CCR Assessment evaluated potential climate hazards, including extreme temperatures, heavy rainfall, drought and increased winds and storms. The assessment concluded that, with the implementation of mitigation measures such as flood-resilient infrastructure, enhanced cooling systems, durable materials, and worker safety protocols outlined in the **oCEMP [EN010159/APP/7.4]**, these risks are minor. As a result, no significant effects are expected the during construction, operation, or decommissioning phases of the Proposed Development in relation to Climate Change Resilience.

5.10.5 The ICCI Assessment found that the Proposed Development would not experience significant changes to its environmental effects due to future climate change. Embedded mitigation measures, such as drainage strategies, landscape management, and resilient design features, ensure that the Proposed Development avoids significant adverse effects under future climate scenarios. Therefore, there are no likely significant effects relating to In-Combination Climate Change.

5.11 Noise and Vibration

Key Terms

Day-time noise	Noise levels from 0700 hrs to 2300 hrs.
Evening noise	Noise levels from 1900 hrs to 2300 hrs.
Night-time noise	Noise levels from 2300 hrs to 0700 hrs.

What is the existing baseline?

5.11.1 To establish the existing noise baseline, noise levels were measured across seven monitoring locations over a 7-day period, capturing daytime, evening, and nighttime conditions. The area is characterised by a rural environment with key contributors to ambient noise being road traffic from the A57, A1, and A113.

What are the Noise and Vibration effects and how are they avoided or managed?

5.11.2 During the construction phase, there will be moderate increases in road traffic noise on Crabtree Lane and minor increases in noise the section of Roadwood Lane closest to the A57. However, since there are no residential properties in the vicinity of these road links, Noise and Vibration effects from construction traffic are minor adverse and non-significant. There may be adverse noise and vibration effects resulting from construction at the nearest residential properties, but these effects are not significant due to their limited duration. Additionally, the **oCEMP [EN010159/APP/7.4]** details noise control measures such as working hours, monitoring, and complaint procedures.

5.11.3 During the operation phase, noise effects would be potentially significant without mitigation. However, with mitigation, including specification of quieter equipment and strategic placement of equipment, a night-time noise limit of 35 dB will be achieved which is assessed as minor and non-significant.

5.11.4 During the decommissioning phase, noise effects are predicted to be similar to construction, minor and non-significant and the same types of measures for managing decommissioning effects will be secured in the DCO through the **oDEMP [EN010159/APP/7.6]**.

One Earth Solar Farm
Environmental Statement Volume 3: Non Technical Summary

5.12 Human Health

Key Terms

Local Study Area	An area comprising four Lower Layer Super Output Areas ('LSOA') which typically comprise between 400 and 1,200 households and have a usual resident population of between 1,000 and 3,000 people. The four LSOAs where the Proposed Development is located comprising: Bassetlaw 015D, Bassetlaw 015F, Newark and Sherwood 004C, West Lindsey 007C.
Wider Study Area	The wider local authority administrative areas of Bassetlaw, Newark and Sherwood and West Lindsey form the 'Wider Study Area'.

What is the existing baseline?

5.12.1 The existing baseline for Human Health in the Local Study Area was established using publicly available data sources. The Local Study Area has an aging population, but the majority of residents (81%) consider themselves to have 'very good' or 'good' health.There are two GP facilities in the Wider Study Area and hospitals and pharmacies are accessible. The area has PRoWs and community facilities, such as schools, sports pitches, and halls, which support physical activity and well-being. Local deprivation levels are moderate and broadly align with national averages, though some variations exist. For example, Bassetlaw ranks among the 30% most deprived areas in England for health-related factors.

What are the Human Health effects and how are they avoided or managed?

5.12.2 During the construction phase, short-term minor beneficial effects on employment and income are expected, alongside minor adverse effects on physical activity, healthcare services, and community resilience due to temporary disruptions to PRoW and increased demand for local healthcare services arising from construction workers in the area. However, these effects are considered non-significant.

5.12.3 During the operational phase, there will be long-term significant beneficial effects on energy infrastructure and climate change mitigation. The Proposed Development helps mitigate both the physical and mental health risks associated with climate change by reducing emissions. It addresses climate-related health challenges, including extreme weather impacts, declining living standards, and global health inequalities, while also alleviating climate anxiety by contributing to positive climate action. There will be no temporary or permanent diversions to the existing PRoW network and approximately 6km of new permissive paths will be created. There will also be minor adverse effects on community identity and resilience due to changes in the landscape and views, which could cause community anxiety or stress. However, with the use of mitigation measures, such as screening or green infrastructure, these adverse effects are considered non-significant. Effects on electromagnetic fields are negligible and nonsignificant.

5.12.4 Decommissioning effects are similar to construction - temporary and non-significant.

5.12.5 The design of the Proposed Development includes embedded measures such as strategic offsets, setbacks, and ecological corridors to minimise visual and landscape impacts while maintaining connectivity and improving biodiversity as set out in the Outline Design Approach and the **oLEMP [EN010159/APP/7.5]**. These measures affect all phases of the proposed development, contributing to towards mitigation of adverse mental health impacts.

5.12.6 The Proposed Development also incorporated embedded environmental measures including the adoption of the **oCEMP [EN010159/APP/7.4]**, **oCTMP** and **oDEMP [EN010159/APP/7.6]**. These documents include good design and best practice measures to ensure that adverse impacts to air quality, noise and traffic are avoided, reduced or mitigated, which is important for human health. The Applicant will provide a Community Liaison Officer for all phases of the Proposed Development, who will be appointed to lead discussions with local communities through a Community Liaison Group, ensuring residents are well informed about the Proposed Development throughout its duration.

5.13 Socio-Economics

Key Terms

Local Area	An area comprising four Lower Layer Super Output Areas ('LSOA') which typically comprise between 400 and 1,200 households and have a usual resident population of between 1,000 and 3,000 people. The four LSOAs where the Proposed Development is located comprising: Bassetlaw 015D, Bassetlaw 015F, Newark and Sherwood 004C, West Lindsey 007C

What is the existing baseline?

5.13.1 The existing baseline for Socio-Economics was established using publicly available sources and through a survey of owners of land within the Site. The Local Area is characterised by low unemployment, a higher-than-average age population, and a relatively small contribution of agriculture to employment. Several PRoW intersect the Site and the region hosts modest tourist facilities.

What are the Socio-Economic effects and how are they avoided or managed?

5.13.2 During construction, significant beneficial effects are anticipated with the creation of an average of 554 jobs (peaking at 750) and supply chain benefits. There may be temporary disruptions to PRoW and impacts on amenity and tourism, however these effects are minor and not considered significant. Once operational, the Proposed Development will have a negligible effect on jobs, providing 15 jobs for operations and management (a net increase of 7.25 direct Full Time Equivalent jobs). Negligible effects on PRoW accessibility are expected due to slightly improved connectivity and additional permissive paths, but these effects are not significant. Effects on tourism are negligible and non-significant. During decommissioning, the effects are similar to construction.

5.13.3 The Proposed Development aims to maximise socio-economic benefits through various environmental measures. Employment opportunities will be created across construction, operation, and decommissioning phases, supported by the outline **Skills and Supply Chain Management Plan (oSSCMP)** (see **Volume 7: Other Documents [EN010159/APP/7.8]**), which will maximise local hiring and economic benefits. Apprenticeships and training programs will be developed in collaboration with local educational institutions. The project also introduces new permissive paths improve connectivity between villages as secured by the **oLEMP [EN010159/APP/7.5]**. Local amenities will be enhanced with new grassland, wildflower meadows, hedgerows, and tree planting, supporting biodiversity and public well-being. Additionally, the project will diversify revenue streams for landowners and contribute to renewable energy production, reducing greenhouse gas emissions and enhancing energy security.

6 Cumulative Effects

6 Cumulative Effects

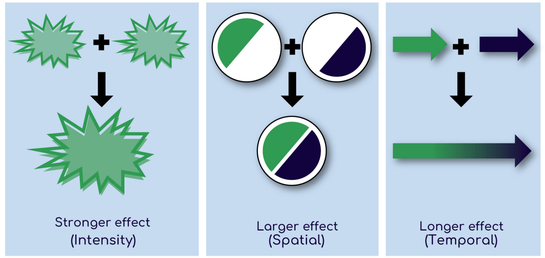
Key Terms

Cumulative effects	There are two types of cumulative effects: Intra-Project Effects: The interaction between different environmental effects resulting from a proposed development on the same receptor. Inter-Project Effects: Different environmental effects resulting from a proposed development in combination with effects from other nearby projects on the same receptor.
Other Development	Development projects which are under construction, approved or reasonably likely to be built and operational in the future.
Zone of Influence	A geographical area surrounding a proposed development which could result in likely significant effects. The ZoI is used to identify potential Other Developments to include within the assessment of cumulative effects.

6.1 What are Cumulative Effects?

6.1.1 Cumulative effects occur when individual effects combine to create a stronger (intensity), larger (spatial), or longer-lasting (temporal) effect, amplifying environmental consequences beyond the individual effect, as visualised in **Figure 9**.

Fiaure 9: Cumulative Effects



6.1.2 A Cumulative Effects Assessment (CEA) looks at the combined environmental impacts of One Earth Solar Farm. The assessment considers two types of cumulative effect:

Intra-Project Effects: How different environmental effects (e.g. Landscape and Visual effects, Cultural Heritage effects or Noise and Vibration effects) resulting from the Proposed Development might combine to have an effect on the same receptor..

Inter-Project Effects: How different environmental effects resulting from the Proposed Development might combine with those from other nearby projects, (described as 'Other Developments') to have an effect on the same receptor..

One Earth Solar Farm
Environmental Statement Volume 3: Non Technical Summary

6.2 Intra-Project Effects

How were Intra-Project Effects assessed?

6.2.1 In order to identify significant intra-project effects, categories of sensitive receptors were identified from the individual aspect assessments, for example residential receptors or heritage assets. Secondly, all effects established that were associated with sensitive receptor categories were identified to identify any potentially significant effects.

What are the Intra-Project effects?

6.2.2 Considering the adverse effects identified by the individual environmental aspect assessments (Cultural Heritage, Landscape and Visual and Buried Heritage), there are no likely significant effect interactions. For example, when considering buried heritage, there are no interactive effects during construction and decommissioning with landscape or visual or cultural heritage effects due to its below-ground nature. For cultural heritage, any effects on the setting of heritage assets are aligned with landscape and visual effects but do not compound them. Therefore, while individual effects may be significant, there is no meaningful interaction or amplification of these effects within the project during construction, operation or decommissioning.

6.2.3 It should also be noted that the socio-economics, and human health assessments consider effect interactions, such as with air quality, noise and traffic and transport. No significant adverse intra-projects were identified within these assessments

6.3 Inter-Project Effects

How were the Inter-Project Effects assessed?

6.3.1 In order to identify potentially significant intra-project effects, an iterative process of four-stages was undertaken:

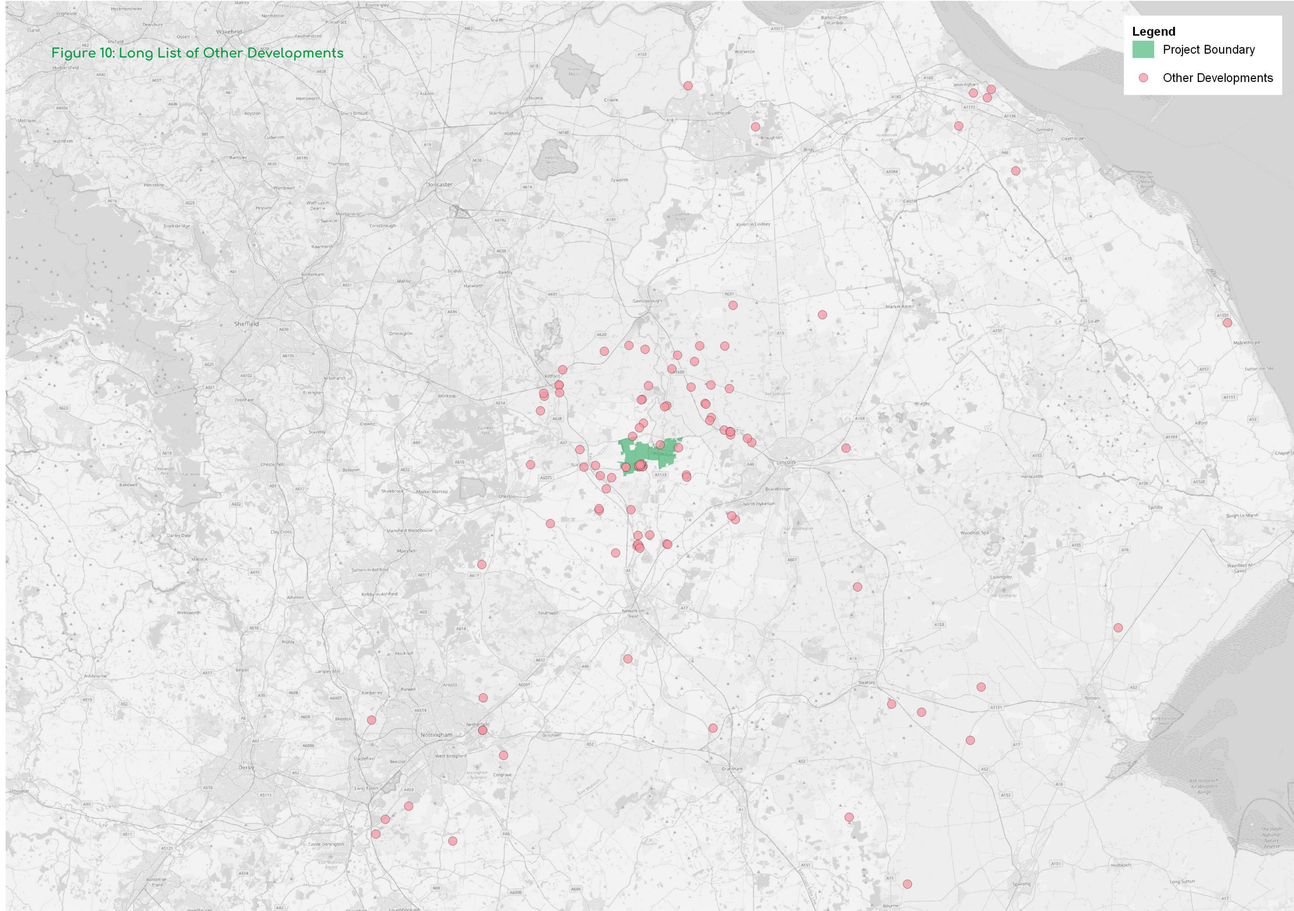
Stage 1:
A total of 107 Other Developments were selected to form a 'Long List' of developments using defined criteria, such as proximity to the Proposed Development, development scale, and application status. The list was developed through consultation with local authorities, a review of planning registers, and information from the PINS website. The Long List of Other Developments is visualised in **Figure 10**.

Stage 2:
Using a Zone of Influence (ZoI), which varies by environmental aspect, were identified to create a 'Short List' was defined. For example, for Cultural Heritage other developments within a 2km radius of the Proposed Development were identified and selected to move forward to the Short List.

Stage 3:
Publicly available information was gathered on each of the Other Developments listed in the Short List.

Stage 4:
The cumulative effect between the Proposed Development and each of the Other Developments listed in the Short List is assessed, both individually and where relevant, collectively. If these combined effects are stronger or different from what was originally expected for the Proposed Development alone, additional measures would be required to reduce or manage these new effects, along with ways to monitor their success.

Figure 10: Long List of Other Developments



What are the Inter-Project effects?

6.3.2 There are no significant cumulative effects generated from the combined effect of the Proposed Development and Other Developments in relation to Biodiversity, Hydrology, Buried Heritage, Transport and Access, Air Quality, Noise and Vibration. This largely is due to the implementation of comprehensive mitigation measures, including environmental management plans such as the **oCEMP [EN010159/APP/7.4]** and **oDEMP [EN010159/APP/7.6]**, site-specific assessments, regulatory compliance, and ongoing management strategies for the Proposed Development and Other Developments where relevant. These measures ensure that potential effects are effectively controlled, remain within acceptable thresholds, and do not contribute to any significant cumulative effects.

6.3.3 With respect to Land and Soils, there will be no significant cumulative effects relating to land and groundwater on account of the aforementioned management. Regarding soil and BMV land, the assessment of cumulative effects considers the cumulative impact of Other Developments at a county level (Nottinghamshire and Lincolnshire) rather an individually with Other Developments. Most of the BMV land affected by solar farm developments will be returned to agricultural use after their operational periods, ensuring that long-term agricultural capacity remains largely intact. However, a total of 174.13 ha of agricultural land will be permanently lost across Nottinghamshire and Lincolnshire, by projects such as residential developments and quarry extensions. Despite this, the proportion of BMV land permanently lost remains small relative to the remaining BMV available at a county level, meaning the overall cumulative impact is limited. Additionally, the **oSMP [EN010159/APP/7.10]** will be in place to mitigate soil degradation and maintain land productivity, ensuring that temporary disruptions, such as those from cable and grid connection works, do not lead to long-term damage. There will be no significant cumulative effect on food security as the percentage change in land use is within the 'normal' range.

6.3.4 With respect to Cultural Heritage, Other Development 21/01735/COU was considered with regard to the setting of Whimpton Moor Scheduled Monument for which the Propsed Development has been assessed as having an adverse effect of major - moderate significance with regard to the setting. However, it is concluded that this Other Development would not be seen within the context of the Proposed Development nor the informative setting of Whimpton Moor Scheduled Monument or Whimpton House (Grade II). As such, it is concluded that no significant cumulative effect interaction would be anticipated. Other Development WL/2024/00123 was considered with regard to the Scheduled Monument of the Roman Vexillation Fortress and Royal Observer Corps Monitoring Post for which the Proposed Developmet is assessed as having a minor neutral effect on the setting. However, it is concluded that this Other Development would not impact the setting of the Schedule Monument and there is limited interrelationship between this scheme and the Proposed Development due to the distance between them / the topography, no cumulative effects would arise.

6.3.5 With respect to Landscape and Visual, there will be significant adverse cumulative effects with two Other Developments referred to as ID 27 (Planning Reference: 21/01577/FULM), and ID 50 (Planning Reference: EN020034). The addition of the Other Development ID 27 with the Proposed Development will cause a significant adverse effect the landscape character of the Normanton-On-Trent published character area during construction and operation. The addition of the Other Development ID 50 with the Proposed Development would cause a significant adverse effect on visual amenity of PRoW to the south of East Drayton during construction and operation. The cumulative effect of the Proposed Development and Other Developments (excluding ID 27 and 50) is considered not significant due to factors such as limited visibility, separation by natural features, smaller scale or different development, lack of overlapping viewpoints, existing landscape context, and effective mitigation measures.

6.3.6 With respect to Carbon and Climate change, the assessment of likely significant effects is global rather than project-specific, making localised cumulative effects not applicable.

6.3.7 With respect to Human Health, there will be no significant cumulative effects to community identify, demand for health and social care facilities and electromagnetic fields. However, where the cumulative contribution of other energy infrastructure projects supports broader climate change mitigation efforts, there may be positive wider societal effects for public health. However, given their scale it is not expected to be significant.

6.3.8 With respect to Socio-Economics there will be no significant comulative effects to amenity, PRoW use and tourism. There may be minor beneficial cumulative effects, including job creation and local investment, particularly during construction. However, these effects are not expected to be significant.

7 Abbreviations and Acronyms

7 Abbreviations and Acronyms

Agricultural Land Classification (ALC)
Air Quality Management Area (AQMA)
Alternating Current (AC)
Areas of Archaeological Constraint (AAC)
Archaeological Clerk of Works (ACoW)
Archaeological Mitigation Strategy (AMS)
Battery Energy Storage System (BESS)
Best and Most Versatile (BMV)
Biodiversity Net Gain (BNG)
Climate Change Resilience (CCR)
Cumulative Effects Assessment (CEA)
Decommissioning Traffic Management Plan (DTMP)
Development Consent Order (DCO)
Direct Current (DC)
Dust Management Plan (DMP)
Ecological Clerk of Works (ECoW)
Environmental Impact Assessment (EIA)
Environmental Statement (ES)
Heavy Goods Vehicle (HGV)
Greenhouse Gas (GHG)
Horizontal Directional Drilling (HDD)
In-Combination Climate Change Impact (ICCI)
Institute of Air Quality Management (IAQM)
Local Village Character Assessment (LVCA)
Local Wildlife Site (LWS)
Nationally Significant Infrastructure Project (NSIP)
Non-Technical Summary (NTS)
Megawatts (MW)
Onsite Access Management Plan (OAMP)
Outline Construction Environmental Management Plan (oCEMP)
Outline Construction Traffic Management Plan (oCTMP)
Outline Decommissioning Environmental Management Plan (oDEMP)
Outline Skills and Supply Chain Management Plan (oESSCMP)
Outline Landscape and Ecology Management Plan (oLEMP)
Outline Operational Environmental Management Plan (oOEMP)
Outline Soil Management Plan (oSMP)
Overarching Written Statement of Investigation (OWI)
Planning Inspectorate (PINS)
Power Conversion Stations (PCS)
Preliminary Environmental Information Report (PEIR)
Public Rights of Way (PRoW)
Site of Special Scientific Interest (SSSI)
Solar Photovoltaic (PV)
Source Protection Zones (SPZs)
Zone of Influence (ZoI)
Zone of Theoretical Visibility (ZTV)

8 Environmental Statement Availability

8 Environmental Statement Availability

8.3.1 The ES is available for viewing by the public on the One Earth Solar Farm website at: https://oneearthsolarfarm.co.uk/

8.3.2 Additional electronic copies of the ES can be purchased on request. Contact details are as follows:

One Earth Solar Farm
Freepost SEC NEWGATE UK LOCAL
(no stamp is needed)

info@oneearthsolarfarm.co.uk

One Earth Solar Farm
Environmental Statement Volume 3: Non Technical Summary

one earth
solar farm