



Longfield Solar Farm

Environmental Statement [PINS Ref: EN010118]

Volume 4

Non-Technical Summary

EN010118/APP/6.4

Revision Number: 1.0

February 2022

Longfield Solar Energy Farm Ltd

APFP Regulation 5(2)(a)

Planning Act 2008

Infrastructure Planning (Applications: Prescribed Forms and Procedure)
Regulations 2009

Quality information

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Table of Contents

1.	Introduction	1
1.1	Background	1
1.2	The Order Limits	1
1.3	The Applicant and Author of the ES	1
1.4	The Purpose of the Environmental Statement and NTS.....	2
2.	EIA Process and Methodology	2
2.2	Overview	2
2.3	EIA Scoping.....	3
2.4	Preliminary Environmental Information Report	3
2.5	Consultation	4
3.	Site Selection and Design Evolution	5
4.	Scheme Description	6
4.1	The Order limits.....	6
4.2	Description of the Scheme	8
4.3	Construction	14
4.4	Operation	17
4.5	Decommissioning.....	17
5.	Assessing Environmental Effects	18
5.1	Topics Assessed.....	18
5.2	Terminology Used in the Environmental Statement.....	19
6.	Findings of the Environmental Statement	19
6.2	Climate Change	19
6.3	Cultural Heritage	21
6.4	Ecology.....	25
6.5	Water Environment.....	27
6.6	Landscape and Visual Impact Assessment	30
6.7	Noise and Vibration	37
6.8	Socio-economic and Land Use	40
6.9	Transport and Access	46
6.10	Air Quality.....	54
6.11	Human Health	55
6.12	Other Issues	57
6.13	Effect Interactions and Cumulative Schemes	62
7.	Summary and Conclusions	64
8.	References	65

1. Introduction

1.1 Background

1.1.1 This document has been prepared on behalf of Longfield Solar Energy Farm Ltd (the 'Applicant') and provides a Non-Technical Summary (NTS) of the Environmental Statement (ES) for the proposed Longfield Solar Farm.

1.1.2 The Applicant has submitted an application for a Development Consent Order (DCO) to the Secretary of State for Business, Energy, and Industrial Strategy for the construction, operation (including maintenance), and decommissioning of a photovoltaic¹ (PV) array electricity generating facility exceeding 50 megawatts (MW) capacity, with associated battery storage facility and connection to the UK electricity transmission system (hereafter referred to as the 'Scheme').

1.2 The Order Limits

1.2.1 The land for which DCO consent is being sought is referred to as the 'Order limits' and comprises 452.93 hectares (ha) of land (with the rounded figure of 453ha being used for descriptive purposes throughout the technical chapters of the ES), centred on National Grid Reference TL 74179 14620. It is located 5.7 kilometres (km) north west of Chelmsford and approximately 1.1 km to the west of the village of Terling.

1.2.2 The Order limits is shown on **Figure 1-2** of the ES [EN010118/APP/6.3].

1.2.3 A description of the physical characteristics of the Scheme and the land-use during the construction, operational, and decommissioning phases is presented in Section 4: Scheme Description of this NTS.

1.3 The Applicant and Author of the ES

1.3.1 The Applicant, Longfield Solar Energy Farm Ltd, is a joint venture formed by two industry specialists: EDF-Renewables and Padero Solar.

1.3.2 EDF-Renewables is a global renewable energy affiliate of the EDF Group, delivering renewable energy projects in over 20 countries. In the UK, it provides much needed new affordable low carbon energy through 36 wind farms and one of the UK's largest battery storage units (together totalling almost 1GW). It also has a portfolio of rooftop solar and grid scale solar energy generation in development.

1.3.3 Padero Solar has developed more than 25 solar farms in the UK, and this has delivered over 390MW of renewable energy. Padero Solar is part of a group of three companies. These include PS Renewables, who are behind a number of solar projects, including Eveley Solar Farm (Hampshire) and PSH Operations, an Operations & Maintenance business managing over 1.3GWs of Solar Farm assets in the UK.

¹ Photovoltaic is the generation of electricity from sunlight.

1.3.4 The ES has been prepared by AECOM Limited. This document presents a non-technical summary of the results of the ES [EN010118/APP/6.4]. AECOM is a registrant to the Environmental Impact Assessment (EIA) Quality Mark scheme run by the Institute of Environmental Management and Assessment (IEMA).

1.4 The Purpose of the Environmental Statement and NTS

1.4.1 The ES [EN010118/APP/6.1] has been produced to accompany the Application, as required by the Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (“the EIA Regulations”) (Ref 1-1), in order to ensure that the Examining Authority (who considers the Application), and the Secretary of State (who makes the ultimate decision as to whether consent should be granted for the Scheme) are aware of the likely significant effects on the environment as a result of the Scheme when taking their decision. The ES complies with all the elements of Schedule 4 of the EIA Regulations.

1.4.2 The purpose of this NTS is to describe the Scheme and to provide a summary in non-technical language, of the key findings of the ES.

2. EIA Process and Methodology

2.1.1 **Chapter 5: EIA Methodology** of the ES [EN010118/APP/6.1] describes the approach the EIA has taken to assessing impacts associated with the Scheme, including the significance criteria against which impacts have been assessed.

2.2 Overview

2.2.1 EIA is the process undertaken to identify and evaluate the likely significant effects of a proposed development on the environment and to identify measures to mitigate or manage any significant negative effects. The EIA should be informed by consultation with statutory consultees, other interested bodies and members of the public. The purpose of identifying significant effects is to ensure decision makers are able to make an informed judgement on the environmental impacts of a proposal. The findings of the EIA are presented in the ES (which is summarised in this NTS).

2.2.2 The process of assessing and minimising effects involves continually feeding back environmental information obtained through surveys and consultation into the project design and re-evaluating the likely effects of the Scheme as a result.

2.2.3 All environmental assessments in the ES follow a similar methodology. The likely effect that the Scheme may have on each receptor is influenced by a combination of the sensitivity of the receptor and the predicted magnitude of change from the baseline conditions (either positive (beneficial) or negative (adverse)).

2.2.4 The environmental sensitivity, value, or importance of a receptor may be categorised by a range of factors, such as threat to rare or endangered species, transformation of natural landscapes, or changes to soil quality and land-use.

- 2.2.5 The overall likely effect is determined by the interaction of the above two factors (i.e., sensitivity/importance and predicted magnitude of change from the baseline). Each chapter sets a threshold above which effects are considered to be “significant” in terms of the EIA Regulations. Where the magnitude of change is identified as “neutral”, there is no effect.
- 2.2.6 Residual effects are the effects that remains after the proposed mitigation has been taken into account.
- 2.2.7 Cumulative effects have also been assessed, which take into account other proposed developments in the area which could lead to additional effects in combination with the Scheme.
- 2.2.8 The ES provides the latest environmental information obtained and assessed as part of the EIA. It accompanies the Application and follows a systematic approach to EIA and project design. The process of identifying environmental effects has been both iterative and cyclical, running in tandem with the iterative design process.

2.3 EIA Scoping

- 2.3.1 An EIA Scoping Report and a request for an EIA Scoping Opinion under Regulation 10 of the EIA Regulations was submitted to the Planning Inspectorate on 5 November 2020.
- 2.3.2 The aim of the EIA Scoping process is to identify expected key environmental issues at an early stage, to determine which elements of the Scheme are likely to result in significant effects on the environment and to establish the extent of survey and assessment requirements for the EIA, including identifying which topics should be included in the EIA and the level of detail to which they should be assessed.
- 2.3.3 The Scoping Opinion was received on 16 December 2020 and presents the formal response from the Planning Inspectorate (on behalf of the Secretary of State) and statutory consultees.
- 2.3.4 The ES is based on the Scoping Opinion, with the matters raised having been reviewed and taken into consideration in the relevant technical assessments. Key issues raised in the Scoping Opinion are summarised at the start of each of the technical chapters (**Chapters 6 to 16**) of the ES [EN010118/APP/6.1].

2.4 Preliminary Environmental Information Report

- 2.4.1 A Preliminary Environmental Information (PEI) Report was prepared and published in May 2021 as part of the statutory consultation exercise undertaken by the Applicant. The purpose of the PEI Report was to “*enable the local community to understand the environmental effects of the proposed development so as to inform their responses regarding the proposed development*” (Planning Inspectorate, Planning Advice Note 7). It was also prepared to meet the requirements of Regulation 12(2) of the EIA Regulations.
- 2.4.2 The PEI Report provided the preliminary findings of the environmental assessment undertaken at that time in the Scheme design development. Upon completion of the PEI Report, the various assessments were at differing

stages of completion due to ongoing design work and continued collection of baseline information.

- 2.4.3 The PEI Report has been further developed following completion of the design work and environmental assessment and now constitutes the ES, which this NTS summarises.

2.5 Consultation

- 2.5.1 Consultation is integral to the preparation of DCO applications and to the EIA process. The views of consultation bodies and the local community serve to focus the environmental studies and to identify specific issues that required further investigation, as well as to inform aspects of the design of the Scheme. The Planning Act (2008) requires applicants for DCOs to carry out formal (statutory) pre-application consultation on their proposals.
- 2.5.2 A two-stage approach to pre-application consultation on the Scheme was adopted. A non-statutory consultation was carried out during November / December 2020, and statutory consultation was undertaken from May through to July 2021, following the publication of the PEI Report in May 2021. The **Consultation Report** submitted as part of the Application [EN010118/APP/5.1] documents the pre-application and statutory consultation undertaken by the Applicant, and the regard had to the responses.
- 2.5.3 Following the statutory consultation set out above, the Applicant made a number of minor changes to the Order limits having regard to feedback from the consultation, and in light of further work on the Scheme's design and environmental impacts. The Applicant wrote to affected consultees to notify them of the changes and invite comment for a 28-day period between 26 October 2021 and 23 November 2021. Following this period, the Applicant became aware of a small error in the Scheme boundary plan issued as part of the targeted consultation. It therefore reissued the plan to the same consultees and provided a 28-day period for responses between 11 January and 8 February 2022.
- 2.5.4 The issues that have been raised through consultation and how these have been considered and addressed within the design evolution of the Scheme and the EIA are set out in each of the technical chapters (**Chapters 6 to 16**) of the ES [EN010118/APP/6.1], and in the **Consultation Report** [EN010118/APP/5.1].
- 2.5.5 In addition, a project website provides up to date information on the project: [REDACTED] and information has been provided proactively to local residents and local community groups in addition to the statutory requirement to consult.

3. Site Selection and Design Evolution

- 3.1.1 **Chapter 3: Alternatives and Design Evolution** of the ES [EN010118/APP/6.1] presents an overview of the justification for selecting the Order limits, how the design has evolved since EIA Scoping, and a discussion of the reasonable alternatives considered.
- 3.1.2 A site search exercise was undertaken to identify the Order limits. The south of England was of particular interest as a location due to the higher levels of solar irradiation experienced relative to other parts of the UK.
- 3.1.3 A range of technical, environmental and economic factors are considered when investigating and assessing any potential site for Nationally Significant Infrastructure Projects (NSIP)-scale ground-mounted Solar PV development. Key factors for consideration include (in no particular order):
- a. Solar irradiation levels;
 - b. Proximity to an available grid connection;
 - c. Topography;
 - d. Field size / shading;
 - e. Access to the site for construction;
 - f. Commercial agreement with a landowner (and minimising the extent to which any powers of compulsory acquisition would be required); and
 - g. Environmental and social parameters described in this document, including proximity to local population, archaeological interest, agricultural land classification, landscape designations, nature conservation designations, and flood risk, for example.
- 3.1.4 Following consideration of the above factors, the area in which the Scheme has been located was identified as having good potential for a large-scale ground mounted Solar PV Array.
- 3.1.5 The preliminary assessment of the early design has led to a variety of key changes to the layout and technology, including for example:
- a. A Battery Energy Storage System (BESS) grouped in a single location that can be more easily screened, rather than installing separate units throughout the Order limits;
 - b. A reduction of the height of the BESS to minimise the visual impact of the containers;
 - c. Selection of a south-facing fixed tilt solar panel layout, which is the most common type of solar panel arrangement in the UK. The option of having panels that follow the movement of the sun or panels that are arranged in an east-west orientation was dismissed. The chosen option has the fewest HGV movements and lowest noise levels.
 - d. A reduction in the maximum height of the Solar PV panels from 3.9m to 3m. This reduction will reduce the potential visual impact of the Scheme, while still delivering the Scheme's target renewable generation.

3.1.6 During the Scoping phase the site comprised a single parcel of land separated by several areas of woodland approximately 582ha in size (the Scoping Boundary). The area consulted upon during non-statutory consultation in November/December 2020 was the same as the Scoping Boundary. Following landowner discussions, consultation feedback, and, Geophysical, Agricultural Land Classification and Environmental Surveys, the PEI Boundary and layout (**Figure 3-2** of the ES [EN010118/APP/6.3]) was developed, comprising approximately 459ha with a potential developable area for solar PV and battery of 293ha. This was a reduction in size from the Scoping Boundary. Statutory Consultation undertaken in May 2021 was based on the PEI Boundary. Following statutory consultation feedback and ongoing engagement with consultees and stakeholders, the Order limits (**Figure 1-2** of the ES [EN010118/APP/6.3]) and Application Layout was developed. The Order limits comprises a single parcel of land separated by several areas of woodland approximately 453ha in size with a developable area of 275.26ha (referred to as the Solar Farm Site). This is a reduction in size from the PEI Boundary.

4. Scheme Description

4.1 The Order limits

- 4.1.1 The Order limits is located within the District Council administrative areas of Chelmsford and Braintree, in the county of Essex. The Order limits comprises approximately 453ha of land for Solar PV Arrays, BESS, the Longfield Substation, Grid Connection Route, Bulls Lodge Substation Extension, Site Access Works, Ancillary Infrastructure (including landscaping and biodiversity measures, cabling, access tracks, fences), as well as Habitat Management Areas. The Order limits is formed by the Solar Farm Site, the Grid Connection Route, the Bulls Lodge Substation Site and Site Access Works. (see **Figure 2-5: Illustrative Concept Design** of the ES [EN010118/APP/6.3]).
- 4.1.2 **Figure 1-2** of the ES [EN010118/APP/6.3] illustrates the Order limits, which is the maximum area of land required for the construction, operation and maintenance, and decommissioning of the Scheme. It includes the Scheme infrastructure and any land set aside for landscaping, ecological and biodiversity enhancements, and recreational connectivity and access.
- 4.1.3 The current landscape within the Order limits (**Plate 1**) consists of agricultural fields mainly under arable production, with a few improved grassland livestock fields to the north-west. There are also some mature trees and hedges, small wooded copses, and ponds. The River Ter, within adjacent woodland and grassland bounds the Order limits in the north. The surrounding habitat is mainly arable and mature broadleaved woodland (plantation, semi-natural and ancient). There are some individual and small clusters of residential properties located adjacent to the Order limits boundary.
- 4.1.4 Other existing infrastructure within the Order limits and surrounding area includes 400kV, 132 kV, and 11kV overhead lines (OHLs) carried by OHL towers and wooden poles. These extend from the south west of the Order limits to the north west of Boreham, across most of the Order limits and to the

- west of Sandy Wood, where the alignment of the OHLs diverts to the west and east of Fuller Street.
- 4.1.5 The existing Bulls Lodge 400kV National Grid substation lies within the south western part of the Order limits, to the west of Brick House Farm and approximately 400m to the north of the A12 carriageway.
- 4.1.6 Two construction access routes are included within the Order limits. These are Wheelers Hill and Cranham Road, to the west of the Solar Farm Site, and Generals Lane to the south of the Bulls Lodge Substation Site.
- 4.1.7 The landscape features immediately surrounding the Order limits comprise a number of villages, including Fuller Street approximately 300m to the north, Gamble's Green and Terling 500m and 1.1km to the east, Boreham 500m to the south-west, Hatfield Peverel 1.5km to the south-east, and Chelmsford 5.7km to the south-west. Boreham Road and Waltham Road run north to south along the western edge of the Order limits, with the A12 carriageway approximately 400m beyond the southern edge of the Order limits to the south of Bulls Lodge Substation.
- 4.1.8 There are six statutory sites for nature conservation within 10km of the Order limits, which are designated for biodiversity reasons. The locations of these statutory sites, relevant to the Scheme are shown in **Figure 8-1** of the ES [EN010118/APP/6.3]. The closest, the River Ter Site of Special Scientific Interest (SSSI), is located immediately adjacent to the Order limits.
- 4.1.9 There are 31 non-statutory sites designated for nature conservation within 2km of the Order limits. These sites have been designated as local wildlife sites (LoWS) for their biodiversity value at a local level and are known to have supporting value to a wide variety of protected and ecologically important species and /or habitats. The locations of these non-statutory sites are shown in **Figure 8-2** of the ES [EN010118/APP/6.3]. Boreham Road Gravel Pits LoWS is located within the Order limits.
- 4.1.10 The majority of the Order limits lies within land at low risk of flooding (less than 1 in 1,000 annual probability). Some areas of higher risk are present in areas associated with the watercourses (1 in 100 or greater annual probability).
- 4.1.11 There are no scheduled monuments, listed buildings, registered parks and gardens, or conservation areas within the Order limits. There are three scheduled monuments within 3km of the Order limits, and 73 listed buildings within 1km of the Order limits. The nearest registered park and garden is Terling Place, approximately 130m to the east of the Order limits. Three conservation areas fall within the 1km study area: the Terling Conservation Area, the Boreham Roman Road/Plantation Road Conservation Area, and the Boreham Church Road Conservation Area. The baseline assessment has identified 151 non-designated archaeological assets within 1km, 13 of which are located within the Order limits.
- 4.1.12 There is an extensive network of public rights of way (PRoW) both within the Order limits and across the surrounding area, as shown in **Figure 2-2** of the ES [EN010118/APP/6.3].



Plate 1: Landscape within the Order limits

4.2 Description of the Scheme

- 4.2.1 The Scheme comprises a solar energy farm with solar photovoltaic (PV) panels and energy storage (battery) infrastructure. The PV Panels will convert the sun's energy into electricity for storage onsite and export to the national grid via an underground cable.
- 4.2.2 Unlike a conventional power station, the environmental impacts of a solar farm are not a direct result of the amount of electricity it can generate. For this reason, it is not proposed that the Longfield Solar Farm is restricted by imposing a limit on how much electricity it can generate.
- 4.2.3 Instead, the Scheme seeks a development consent that would restrict the aspects of the solar farm which have potential environmental impacts – such

as the height of the solar panels, dimensions of infrastructure such as the BESS, and where within the Order limits solar panels would be located. These are known as the 'Design Principles'. This approach also ensures the Longfield Solar Farm will be able to generate electricity as efficiently as possible, using technology which is constantly improving and may allow greater amounts of electricity to be generated in future within the existing Design Principles. Further information about the Design Principles is presented in the sections below, and in **Chapter 2: The Scheme** of the ES [EN010118/APP/6.1].

Concept Design Parameters, Design Principles, and the Rochdale Envelope

- 4.2.4 The Scheme will consist of the principal infrastructure described below and presented in **Chapter 2: The Scheme**. To ensure that the likely significant environmental effects of the Scheme are no worse than those assessed in the EIA and the effect of the Scheme has been properly assessed, the Application proposes that the DCO (the statutory instrument that would give consent to the Scheme, should the Secretary of State choose to grant consent) includes requirements that will require the Scheme to be built and operated within the Design Principles. The location of the Scheme elements is also controlled via the DCO; Schedule 1 to the DCO [EN010118/APP/3.1] describes the elements of the Scheme (divided into numbered work packages) and the **Works Plans** [EN010118/APP/2.2] show the maximum areas within which those Scheme elements are able to be located.
- 4.2.5 A number of elements of detailed design for the Scheme cannot be confirmed until the tendering process for the design and construction of the Scheme has been completed. For example, due to the rapid pace of technological development in the solar PV and energy storage industry, the Scheme could utilise technology which does not currently exist and therefore sufficient flexibility needs to be incorporated into the Application.
- 4.2.6 To address this, a 'Rochdale Envelope' approach is used, which means the worst case has been assessed, and as a result there is confidence that if the Scheme is built at the maximum Design Principles or at sizes and areas within the maximum Design Principles, the environmental effects will either be the same as, or less than, those reported in the ES.
- 4.2.7 The Design Principles are set out in the **Design Statement** [EN010118/APP/7.3]. The assessments within **Chapters 6 to 16** of the ES [EN010118/APP/6.1] have assessed the "worst case" or in other words, the maximum Design Principles.
- 4.2.8 The Design Principles allow for flexibility in the Scheme design. In addition, an illustrative Concept Design (see **Figure 2-5** of the ES [EN010118/APP/6.3]) has been created to provide a tangible example of a scheme that could be constructed within the Design Principles. For example, it is not physically possible to build all the solar infrastructure at its maximum footprints; they overlap in the Design Principles to allow flexibility at the detailed design stage. This Concept Design enables a robust assessment of likely significant effects to be undertaken within this ES, for topics where the nature of the assessment

methodology requires a specific level of detail, namely the landscape and visual, cultural heritage, and noise assessments.

- 4.2.9 The Concept Design parameters all fall within the bounds of the Design Principles, and in many cases, the Concept Design is the same as the Design Principles, such as the height of PV Panels. Where topics within the ES have done an assessment on the basis of the Concept Design, they have also considered and confirmed that the effects predicted for the Concept Design would be no worse for any other scheme constructed within the parameters set by the Design Principles.
- 4.2.10 The Scheme elements are discussed below, and indicative images of the Scheme equipment are presented in **Plate 2**.
- 4.2.11 The Order limits is formed by the Solar Farm Site, the Grid Connection Route, the Bulls Lodge Substation Site and Site Access Works. The location of the Scheme components within the Order limits has been carefully considered and restricted to specific areas, in order to minimise the impacts of those components (as shown on the **Works Plan [EN010118/APP/2.2]**, as explained in Paragraph 4.2.4 above). The Scheme will comprise the following components:
- a. PV Panels (also known as modules): these convert sunlight into electrical current. The maximum height of the highest part of the solar PV panels will be 3m above ground level. PV Panels and PV Mounting Structures combine to form PV Tables;
 - b. BESS Containers: The BESS is designed to provide grid balancing services to the electricity grid. It will do this by allowing excess electricity generated from the PV Panels to be stored in batteries and dispatched when required. The BESS containers will be up to 4.5m in height;
 - c. BESS Compound (compound to house the BESS Battery Containers): the compound will include battery storage containers, battery inverters, transformers and switchgear, access tracks, and a Control Room. The BESS Compound will be located in two fenced compounds either side of the Longfield Substation north of Toppinghoehall Wood with a total area of up to 5.2ha, up to a height of 4.5m (however, security lighting infrastructure and cameras may reach 5m in height). The BESS will be constructed in two phases, with Phase 1 comprising a maximum area of 3.4ha on either side of the Longfield Substation and with Phase 2 (1.8ha) to the east of Longfield Substation to follow after an estimated five years of operation.
 - d. The Longfield Substation: this will be located adjacent to the BESS Compound and will be a maximum of 13m in height;
 - e. The Solar PV Arrays (PV Tables are set out in rows, and groupings of PV Tables form PV Arrays): will be connected by a buried cable laid at one end of a row of PV Panels. These cables will feed into larger cables (either through a junction box, string inverter, or combination of the two) and in turn will connect to a central inverter or transformer.
 - f. Bulls Lodge Substation Extension, including electricity switching station and temporary overhead line alterations;

- g. The electricity generated by the Scheme will be exported to the National Grid via the Grid Connection Route, via a connection between the Longfield Substation and the Bulls Lodge Substation Extension. This connection will also facilitate the import of electricity to be stored within the BESS.
- h. Ancillary development which is comprised of: (a) works including electrical cables, boundary treatment, means of access including permissive paths, security infrastructure, landscaping and biodiversity measures, earthworks, drainage and overhead line diversion, which could be located across the Solar Farm Site in what is described as the Ancillary Infrastructure Area; and (b) works such as drainage, utility and communications connections, and site preparation works, which may be carried out across the Order limits;
- i. Temporary construction compounds for the Solar Farm Site, secondary temporary construction compounds within the Solar Farm Site, temporary construction laydown for the Bulls Lodge Substation Extension, and temporary construction laydown for the Grid Connection Route;
- j. PV Mounting Structures: the PV Panels will be mounted on metal structures (PV Mounting Structures) in groups known as PV Tables, which are grouped together in rows (also called “strings”) to form PV Arrays. These will most likely be galvanized steel or anodised aluminium poles driven into the ground to an indicative maximum depth of 2m;
- k. Balance of Solar System (BoSS): In the Solar Farm Site, inverters, transformers and switchgear form the BoSS and are required to manage the electricity generated by the PV Panels. Inverters are required to convert the direct current (DC) electricity collected by the PV Panels into alternating current (AC), which allows the electricity generated to be exported to the National Grid. Inverters are sized to match the output from the PV Panels. Transformers are required to step up the voltage of the AC electricity generated by the inverters across the Order limits before it reaches the Longfield Substation. Switchgear is the combination of electrical disconnect switches, fuses or circuit breakers used to control, protect and isolate electrical equipment. Switchgear is used both to de-energise equipment to allow work to be done and to clear faults downstream. There are several possible arrangements for the BoSS components, and therefore some flexibility is required with optionality presented in the Concept Design. However, the Design Principle for the height of the BoSS plant will be limited to 3.5m.
- l. Ancillary Buildings, including offices, warehouse and plant storage building up to 0.6ha;
- m. Works to facilitate site access to the Solar Farm Site and the Bulls Lodge Substation Extension;
- n. Fencing and security measures;
- o. Drainage;
- p. Internal access roads and car parking;
- q. Landscaping including habitat management areas; and
- r. Construction laydown areas.

- 4.2.12 During the construction phase, several temporary construction compounds will be required as well as temporary roadways to facilitate access to all land within the Order limits.
- 4.2.13 Opportunities for landscaping, and habitat management will be delivered in areas around the solar infrastructure and on other land within the Order limits.
- 4.2.14 As part of the development of the Scheme, and in order to allow vegetation to establish and provide screening of the Scheme earlier, three categories of planting have been proposed:
- a. Advanced Mitigation Planting (planted 2022);
 - b. Construction Day 1 Planting (planted at the beginning of construction);
and
 - c. Residual Mitigation Planting (planted at the end of construction).



Typical solar PV Panels



Typical centralised inverter



Typical transformer



Typical switchgear



Typical battery storage compound configuration



Typical deer security fencing

Plate 2: Images to show the type of equipment to be used within the Scheme

4.3 Construction

Construction Programme

- 4.3.1 The construction of the Scheme is expected to take place in parallel over 24 months, as follows:
- a. Advanced Mitigation Planting (2022);
 - b. 24-month construction period:
 - i. Enabling / civil works, including Construction Day 1 Planting – 6 months;
 - ii. PV Arrays – 18 months;
 - iii. Longfield Substation and Grid Connection Route – 18 months;
 - iv. BESS Construction Compound – 6 months;
 - v. BESS Installation Phase 1 – 12 - 18 months;
 - vi. Commissioning and site restoration / landscaping, including Residual Mitigation Planting – 3 months;
 - c. BESS Installation Phase 2 (5 years post operation) – 12 -18 months;
- 4.3.2 The construction of the Bulls Lodge Substation Extension is expected to take place over 24 months, in parallel to the construction of the Scheme, as follows:
- a. Enabling / civil works – 6 months;
 - b. Substation extension – 18 months;
 - c. Demobilisation and landscaping – 6 months.
- 4.3.3 Outside of the main construction period, there will be commissioning and connection to the Transmission System, and construction and decommissioning of the temporary OHL diversion. These works are dependent on when outages are available and could take place over a period of four years.
- 4.3.4 These phases of construction would run in parallel, i.e., enabling works does not need to be complete in all areas of the construction site before solar farm construction commences in another part of the site.
- 4.3.5 The construction phase is expected to commence not earlier than the first quarter of 2024 and be completed not earlier than the first quarter of 2026. During the construction phase, several temporary construction compounds will be required as well as temporary roadways to facilitate access to all land within the Order limits.
- 4.3.6 It is not intended that the Scheme will be built in phases, with the exception of the BESS. The BESS may be constructed in two phases, with the first part built alongside the solar PV, and a second phase after five years of operation.
- 4.3.7 In the event that only Phase 1 of the BESS is constructed, with the second phase not required, that area would instead be utilised for Solar PV Arrays.

This area is shown on the Works Plans are being the area for Work No. 2B (BESS) or Work No. 1 (Solar PV).

- 4.3.8 National Grid Electricity Transmission (NGET) may undertake maintenance works and restringing of the overhead lines within the Solar Farm Site during construction of the Scheme. To provide safe access the Applicant will delay installation of Solar PV within the working corridor beneath these overhead lines or, if already installed, temporarily remove panels to allow NGET to carry out this work safely.

Construction Activities

- 4.3.9 The types of construction activities that may be required include (not necessarily in order):

- a. Site preparation;
- b. Import of construction materials, plant and equipment to site;
- c. The establishment of temporary construction compound(s) (to be located on or near cable routes, which are yet to be determined);
- d. Upgrading of existing site tracks / access roads and construction of new tracks;
- e. The upgrade or construction of crossing points (bridges / culverts) over drainage ditches;
- f. Marking out the location of the infrastructure;
- g. Import of components to site;
- h. Erection of PV Mounting Structures;
- i. Mounting of PV Panels;
- j. Installation of electric cabling;
- k. Installation of BoSS;
- l. Installation of BESS;
- m. Construction of Longfield substation;
- n. Cable installation;
- o. The establishment of mobilisation areas and running tracks;
- p. Stripping of topsoil in sections;
- q. Trenching in sections;
- r. Appropriate storage and capping of soil;
- s. Appropriate construction drainage with pumping where necessary;
- t. Sectionalised approach of duct installation;
- u. Excavation and installation of jointing pits;
- v. Cable pulling;
- w. Testing and commissioning; and
- x. Site reinstatement and habitat creation.

Site Access

- 4.3.10 During construction, a single site entrance at the junction of Waltham Road and Cranham Road will be used to access the Bulls Lodge Substation Extension Site. The site entrance will include a security gate and kiosk to

manage access and egress. It will allow HGVs to drive off the public road and park up before entering site without causing queues on the public highway.

- 4.3.11 As part of the temporary construction compound for the Bulls Lodge Substation Extension, a new temporary point of access (“eastern access”) from the existing private road circa 30m to the east of the existing substation access to the temporary compound will be constructed.
- 4.3.12 All construction and decommissioning access has been confirmed in consultation with National Highways (formerly Highways England) and the County Highways Authority.
- 4.3.13 In order to access all of the construction site, a network of tracks will be used, including:
- New permanent access tracks will generally be 4 - 6 m width constructed of permeable crushed aggregate. The main primary access track to the Longfield Substation and BESS area will be 6 m in width, with some smaller secondary routes 4 m in width (the key route from the site entrance to the BESS will remain at 6 m width).
 - Upgraded existing access tracks through widening or resurfacing of existing farm tracks.
 - Use of existing tracks where already suitable.
 - Temporary access tracks to access all parts of the construction site, but where permanent tracks are not necessary.

Construction Staff

- 4.3.14 At the peak of construction, which is assessed as being during 2025, it is estimated that up to 500 workers will be required. This number will be less at other times of the construction phase and if construction is carried out over a slightly longer period than the suggested 24 months.

Construction Hours of Work

- 4.3.15 Construction working hours on the Solar Farm Site will run from 07:00 to 19:00 Monday to Saturday. Working days will generally be one 12-hour shift.
- 4.3.16 Construction working hours on the Bulls Lodge Substation Extension will run from 07:00 to 19:00 Monday to Saturday with the exception of overhead line works which will run from 07:00 to 19:00 Monday to Sunday.

Construction Controls

- 4.3.17 The construction phase will be subject to management documents which will limit and control activities. The outline documentation includes the following documents submitted with the Application:
- Outline Construction Traffic Management Plan (CTMP) (**Appendix 13B [EN010118/APP/6.2]**); and

- b. Outline Construction Environmental Management Plan (OCEMP) Including the Outline Soil Resource Management Plan) **[EN010118/APP/7.10]**.

4.4 Operation

- 4.4.1 During the operational phase, activity within the Scheme will be minimal and will be restricted principally to vegetation management, equipment maintenance and servicing, replacement and renewal of any components that fail, and monitoring. It is anticipated that maintenance and servicing would include the inspection, removal, reconstruction, refurbishment or replacement of faulty or broken equipment and adjusting and altering the solar panel orientation to ensure the continued effective operation of the Scheme and improve its efficiency as set out within the Outline Operational Environmental Management Plan (OEMP) **[EN010118/APP/7.11]**.
- 4.4.2 Along the Grid Connection Route, operational activity will consist of routine inspections (schedule to be determined) and any reactive maintenance such as where a cable has been damaged.
- 4.4.3 Bulls Lodge Substation Extension will be managed and maintained by NGET in line with existing operational procedures. NGET will be responsible for preparing a separate OEMP, or applying their existing OEMP, to the Bulls Lodge Substation Extension.
- 4.4.4 It is anticipated that there will be up to 8 permanent staff onsite during the operational phase, with additional staff attending when required for maintenance and cleaning activities.

4.5 Decommissioning

- 4.5.1 Decommissioning is expected to take between 12 and 24 months and will be undertaken in phases, and for the purposes of the assessment is expected to occur after approximately 40 years of operation of the Scheme. A Decommissioning Environmental Management Plan will be prepared prior to decommissioning and will be secured through the Decommissioning Strategy **[EN010118/APP/7.12]**.
- 4.5.2 The Solar PV Array Works Area and related components, Ancillary Infrastructure, Longfield Substation and the BESS will be removed and recycled or disposed of in accordance with good practice and market conditions at that time.
- 4.5.3 The underground cable within the Grid Connection Route would be removed to a depth of 1m, otherwise would remain in situ.
- 4.5.4 The Bulls Lodge Substation Extension would remain operational, as would the section of existing OHL which will be undergrounded within the Solar Farm Site prior to operation, and would remain in situ upon decommissioning.
- 4.5.5 The effects of decommissioning are similar to, or often of a lesser magnitude than construction effects and will be considered in the relevant sections of the ES. However, there can be a high degree of uncertainty regarding

decommissioning as engineering approaches and technologies are likely to change over the operational life of the Scheme.

5. Assessing Environmental Effects

5.1 Topics Assessed

- 5.1.1 **Chapters 1 to 5** of the ES [EN010118/APP/6.1] provide an introduction to the policy and legislative context, a description of the Order limits and surrounds, an overview of the Scheme and alternatives that were considered during the design process, an overview of Consultation timelines, and the approach and methodology to the EIA.
- 5.1.2 The following technical chapters have been produced and assessed in Volume 1 of the ES [EN010118/APP/6.1]:
- Chapter 6: Climate Change
 - Chapter 7: Cultural Heritage
 - Chapter 8: Ecology
 - Chapter 9: Water Environment
 - Chapter 10: Landscape and Visual
 - Chapter 11: Noise and Vibration
 - Chapter 12: Socio-Economics and Land Use
 - Chapter 13: Transport and Access
 - Chapter 14: Air Quality
 - Chapter 15: Human Health
 - Chapter 16: Other Issues
- 5.1.3 **Chapter 16: Other Environmental Topics** of the ES [EN010118/APP/6.1] provides an overview of the topics that can be addressed more concisely than the other technical chapters and therefore do not merit an individual chapter. These topics are glint and glare; ground conditions; major accidents and disasters; telecommunications, television reception, utilities; and waste.
- 5.1.4 **Chapter 17: Effect Interactions** of the ES [EN010118/APP/6.1] documents the effect interactions that lead to combined effects on sensitive receptors.
- 5.1.5 **Chapter 18: Summary of Environmental Effects** of the ES [EN010118/APP/6.1] presents a brief summary of the ES, outlining the residual significant effects remaining following the implementation of mitigation.

5.2 Terminology Used in the Environmental Statement

- 5.2.1 To enable comparison between technical topics and to aid understanding of the ES findings, standard terms are used wherever possible to describe the relative significance of effects throughout the ES (i.e., ‘**major**’, ‘**moderate**’, ‘**minor**’ and ‘**negligible**’). The effects are also described as being adverse or beneficial. Where the quality standards for each technical discipline result in deviations in the standard assessment methodology, these are described in the relevant chapters as applicable within the ES.
- 5.2.2 Each of the technical chapters within the ES provides further description and definition of the significance criteria relevant to each topic. Where possible, this has been based upon quantitative and accepted criteria (for example, noise assessment guidelines), together with the use of value judgement and expert interpretation to establish to what extent an effect is significant.
- 5.2.3 Typically, effects that are considered to be **negligible** or **minor** are judged to be ‘**not significant**’, whereas those that are **moderate** or **major** are ‘**significant**’. Where the EIA predicts a significant adverse effect on one or more receptors, we have considered whether there are further mitigation measures which could avoid or reduce the effect, or to reduce the likelihood of it happening. The use of any such mitigation will be secured through the DCO, should it be granted, and this is made clear in the ES. As the design of the Scheme has evolved to date, work has been done with environmental specialists to avoid or reduce environmental effects on receptors where possible through the use of embedded mitigation measures (meaning measures that form part of the design or methods for construction or operation), such as the use of a CEMP or reduction in height of the BESS or Solar PV Panels. These measures are taken into account in the EIA and assessment of effects of the Scheme.

6. Findings of the Environmental Statement

- 6.1.1 An assessment of the environmental effects of the Scheme during its construction, operation (including maintenance), and eventual decommissioning has been completed for each of the topics identified in Section 5.1 above.
- 6.1.2 The conclusions on the likely significant environmental effects of the Scheme are described within the ES. This section provides a brief summary of the overall findings of the report.

6.2 Climate Change

- 6.2.1 **Chapter 6: Climate Change** of the ES [EN010118/APP/6.1] presents the findings of a Lifecycle Greenhouse Gas impact assessment of the potential significant effects of the Scheme on climate change (i.e., greenhouse gas emissions from the construction, operation, and decommissioning of the

Scheme). The resilience of the Scheme to projected future climate change impacts is also assessed through a Climate Change Resilience Review (including damage to the Scheme caused by accidents resulting from climate change).

Baseline and Context

- 6.2.2 It is the duty of the UK Government to achieve 'net zero' carbon emissions by 2050. 'Net zero' refers to achieving net zero greenhouse gas emissions from electricity generation, industry, transport and domestic sources by balancing greenhouse gas emissions with greenhouse gas removal, or simply eliminating emissions altogether. The physical impacts of climate change are accelerating and pose a threat to the environment, health, housing, business operations, and financial earnings through extreme weather events such as storms, floods and droughts. Understanding the nature of these risks will allow new facilities to be designed in a manner which increases resilience and takes advantage of opportunities from the outset, thereby reducing costs in the future.
- 6.2.3 For the lifecycle Green House Gas impact assessment, the baseline for greenhouse gas emissions is a 'business as usual' scenario whereby the Scheme is not implemented. While the current land use within the Order limits will have minor levels of associated greenhouse gas emissions, it is anticipated that these emissions will not be material in the context of the overall Scheme. Therefore, for the purposes of the lifecycle greenhouse gas impact assessment, a greenhouse gas emissions baseline of zero is applied.
- 6.2.4 Based on a review of the baseline conditions, the global climate is the receptor for the lifecycle greenhouse gas impact assessment. The sensitivity of this receptor is high, in line with the IEMA guidance on assessing greenhouse gas emissions in EIA, which highlights the importance of mitigating greenhouse gas emissions to reduce the impacts of climate change.
- 6.2.5 The receptor for the review of climate change resilience is the Scheme itself, including all infrastructure, assets, and workers on site during construction, operation, and decommissioning.

Assessment of Effects

- 6.2.6 The assessment has considered the resilience of the Scheme to climate change and adequate measures such as sustainable drainage have been integrated into the Scheme design.
- 6.2.7 The greenhouse gas impact of construction and decommissioning are anticipated to result in **minor adverse, not significant** effects on the climate, while the impact of operation of the Scheme is considered to have a **major beneficial, significant** effect on the climate, both for the years up to and including 2037 and from 2038 onwards. Overall, the whole-life greenhouse gas impact can be expressed in terms of the average greenhouse gas intensity of the electricity generated by the Scheme over its lifetime.

- 6.2.8 Greenhouse gas emissions savings are expected to be achieved throughout the lifetime of the Scheme. In other words, the greenhouse gas emissions that will occur during construction, operation, and decommissioning of the Scheme will be ‘offset’ by the net positive impact of the Scheme on greenhouse gas emissions by displacing or avoiding fossil fuel generation.
- 6.2.9 The greenhouse gas savings achieved throughout the lifetime of the Scheme demonstrate the role solar energy generation has to play in the transition to, and longer-term maintenance of, a low-carbon economy. Without low-carbon energy generation projects such as the Scheme, the average grid greenhouse gas intensity will not decrease as currently targeted by the Government, which could adversely affect the UK’s ability to meet its carbon reduction targets.
- 6.2.10 As the greenhouse gas intensity of the Scheme remains below the projected grid average throughout its lifetime, it is considered that the beneficial impact of the Scheme is of high magnitude. Therefore, the Scheme overall is considered to have a **major beneficial, significant** effect on the climate.
- 6.2.11 Potential climate change impacts during construction, operation, and decommissioning in relation to climate change resilience are considered **negligible** or **minor adverse**, and therefore **no significant** effects are anticipated.

Mitigation Measures

- 6.2.12 A number of embedded construction mitigation measures are included within the Scheme, as set out within the **OCEMP [EN010118/APP/7.10]**. Specific embedded mitigation measures include increasing recyclability of materials, minimising the creation of waste and maximising the use of alternative materials with lower embodied carbon, and encouraging the use of lower carbon modes of transport. The nature of the Scheme itself will have a beneficial effect in terms of greenhouse gas emissions on climate change and therefore no additional mitigation or monitoring beyond the measures described above are required during construction, operation, or decommissioning of the Scheme.

6.3 Cultural Heritage

Baseline and Context

- 6.3.1 **Chapter 7: Cultural Heritage** of the ES [EN010118/APP/6.1] considers potential impacts on designated and non-designated heritage assets. Cultural heritage comprises all aspects of the environment resulting from the interaction and relationships between people and places through time. Heritage assets include buildings, monuments, sites, places, areas or landscapes identified as having a degree of significance due to their heritage interest.
- 6.3.2 The Order limits occupies a large area which has largely not been subject to previous archaeological study. There are no scheduled monuments, listed buildings, registered parks and gardens or conservation areas within the Order limits. There are three scheduled monuments within the 3km cultural heritage

study area, and 73 listed buildings within 1km. The nearest registered park and garden is Terling Place, that falls partly within the 1km study area of the Scheme. Three conservation areas fall within the 1km study area: the Terling Conservation Area, the Boreham Roman Road/Plantation Road Conservation Area, and the Boreham Church Road Conservation Area. The baseline assessment has identified 151 non-designated archaeological assets within the 1km study area, 13 of which are located within the Order limits.

- 6.3.3 The baseline assessment has highlighted the potential for unknown archaeological assets within the Order limits which could be of local, regional, or national significance. The baseline assessment has concluded that there is a high potential for buried features from the medieval, post-medieval, and modern periods, moderate for the Later Prehistoric (Bronze Age and Iron Age), low to moderate for the Romano-British period, and low for the Early Prehistoric (Palaeolithic, Mesolithic and Neolithic), and early medieval periods. There is, however, still a risk that unexpected archaeological remains of all periods may be discovered within the Order limits.

Assessment of Effects

- 6.3.4 The assessment of effects has been undertaken while taking embedded mitigation for the Scheme into account. These measures include mitigation planting to reduce the impacts on the setting of built heritage and historic landscape assets. Buffer areas have been designed around archaeological assets.
- 6.3.5 The assessment undertaken has been informed through a desk study and non-intrusive geophysical surveys and targeted below ground investigative trenching. Construction direct impacts can occur from activities such as breaking up the ground, heavy machinery compacting the ground, levelling the fields, installation of solar panel foundations and associated infrastructure, and connecting the panels to the National Grid through new cable routes.
- 6.3.6 Additional construction activities associated with the Scheme that could have an impact on heritage assets include construction traffic and parking, moving of construction equipment, and establishment of temporary compound areas.
- 6.3.7 It is not anticipated that there will be any physical impact upon any designated heritage assets during construction. All impacts will result from alterations to their setting. Without adequate mitigation, the construction of the Scheme has the potential to impact on a number of non-designated archaeological assets as well as previously unrecorded remains that may be present through partial or total removal of heritage assets, compaction of archaeological deposits by construction traffic and structures, and adverse effects on the setting of heritage assets as a result of visual intrusion, noise, severance, access and amenity.
- 6.3.8 Direct effects on buried archaeology are being prevented or minimised through the design of the Scheme, whereby the Scheme layout has been developed to avoid development in areas of potential archaeological risk; such areas will be planted to provide screening.

- 6.3.9 During construction and operation, there is also the potential for impacts to the setting of local heritage assets from the presence of the Scheme infrastructure and construction machinery. Impacts on the setting potentially include the visual aspect of larger structures, security lighting, noise and associated traffic as well as a result from glint and glare.
- 6.3.10 During construction the effects on the setting of heritage assets (with the exception of Ringers Farmhouse discussed below) have been assessed to be **minor adverse** or **negligible**, and therefore **not significant**.
- 6.3.11 Temporary **moderate adverse, significant** effects have been identified for the following built heritage assets arising during construction and from the presence of the Scheme, and these effects would be experienced for the operational lifetime of the Scheme:
- a) Ringer's Farmhouse (DBH14)
- 6.3.12 The significant effect on the built heritage asset is reversible upon the removal of the Scheme.
- 6.3.13 Based on the current understanding of the value of previously recorded below ground cultural heritage, without mitigation the potential for **significant** effects have also been identified for the following non-designated archaeological assets arising during construction of the Scheme:
- a. Cropmarks of a medieval enclosure and field boundary system (A35);
- b. Cropmarks of various rectilinear features and a ring ditch (A41);
- c. Cropmarks of various rectilinear features and a ring ditch (A92); and
- d. Cropmarks including linear features, rectangular and rectilinear enclosures and an oval enclosure (A106).
- 6.3.14 Following the introduction of additional mitigation / enhancement measures (detailed excavation and recording ahead of construction and trial trench evaluations), the effects to the non-designated archaeological assets listed above have been assessed as **negligible** or **minor adverse**, and therefore **not significant**.
- 6.3.15 Following the decommissioning of the Scheme (e.g., assumed for the purposes of the assessment to be during 2066 and 2067), it is considered that the Scheme, including the solar panels and associated infrastructure will be removed (with the exception of the grid connection and Bulls Lodge Substation Extension) in accordance with the relevant statutory process at that time. It is expected that the selected method of decommissioning would have due regard to health and safety, environmental impact and benefits, and economic aspects which will be set out in and secured via a Decommissioning Strategy **[EN010118/APP/7.12]** which will be secured through a DCO Requirement. Any future maintenance, decommissioning and / or reinstatement works would be subject to prevailing legislation, guidance and permitting regimes. Upon decommissioning, the above-ground physical infrastructure at the Solar Farm Site will be removed and the Solar Farm Site returned to the landowner. This will include the areas of agricultural land where the agricultural resource has

been maintained (and potentially improved) during operation, and the established habitats. Post-decommissioning, the landowner may return the Solar Farm Site to arable use, although it is assumed that established habitats such as hedgerows and woodland would be retained. A well-designed decommissioning scheme would not have any impact beyond the already-disturbed footprint of the Scheme; therefore, it is not anticipated that decommissioning activities would have a direct physical impact upon archaeological remains.

- 6.3.16 While there is the potential for temporary setting impacts during the removal of the solar arrays and infrastructure, it is not anticipated that these will cause additional impacts over and above those reported relating to the long-term presence of the Scheme within an asset's setting. Upon completion of decommissioning, the long-term adverse effects from the Scheme will cease to exist and the setting of the Terling Conservation Area, Terling Place Registered Parks and Gardens (RPG), listed buildings and non-designated buildings within 1km of the Scheme will be restored to the current baseline conditions. This will have a **neutral** impact on the significance of these assets.

Mitigation Measures

- 6.3.17 Embedded mitigation measures already incorporated into the design have been taken into account in the assessment of residual effects in the section above. These measures include mitigation planting to reduce the impacts on the setting of built heritage and historic landscape assets. Proposed planting is included in the **Outline Landscape and Ecology Management Plan (OLEMP) [EN010118/APP/7.13]**.
- 6.3.18 Where no appropriate design mitigation can be applied to the management of the archaeological resource, additional mitigation measures will be applied and set out in the **OCEMP [EN010118/APP/7.10]**. It is proposed that:
- A programme of archaeological evaluation and/or mitigation and recording will be implemented for archaeological remains within the footprint of the Scheme prior to the construction works targeting the assets identified in **Chapter 7: Cultural Heritage**.
 - Where appropriate, a programme of archaeological mitigation fieldwork and recording will be undertaken during construction works as a watching brief where required.
- 6.3.19 A programme of pre-submission evaluation trenching (**Appendix 7D: Trial Trenching Report** of the ES [EN010118/APP/6.2]) based on the results of an Aerial Investigation and Mapping (AIM) assessment (**Appendix 7B: Aerial Investigation and Mapping Report** of the ES [EN010118/APP/6.2]) and geophysical survey (**Appendix 7C: Geophysical Survey** of the ES [EN010118/APP/6.2]) has been carried out to assess which assets are likely to be impacted by the Scheme. The analysis of aerial photograph has also been carried out prior to ES submission and cross-referenced with the results of the geophysical survey and trenching. The results of these investigations will allow an archaeological mitigation strategy to be set out in a Written Scheme of Investigation (WSI), detailing proposed mitigation works and

submitted prior to construction for review to review to Historic England and Essex County Council. This will be secured by a DCO requirement. Once agreed, this document would establish the objectives for the historic environment mitigation and set out the mechanisms for the appointed archaeological contractor to design and programme the fieldwork, undertake evaluation, analysis, reporting and archiving.

- 6.3.20 The setting of heritage assets has continued to be considered throughout detailed design development and opportunities for further mitigation of significant effects, such as through additional screening or setbacks have been implemented, more information can be referred to in **Chapter 3: Alternatives and Design Evolution**, of the ES [EN010118/APP/6.1].

6.4 Ecology

Baseline and Context

- 6.4.1 **Chapter 8: Ecology** of the ES [EN010118/APP/6.1] presents the findings of an assessment of the potential significant effects of the Scheme on ecology and biodiversity. The assessment considers effects on designated sites, habitats, and protected species.
- 6.4.2 Ecological receptors considered in the ES include species and habitat that are important at an international, national, and local level (i.e., how rare and important the species and habitat are). The majority of the Order limits consists of arable land, with areas of grassland, woodland and hedgerows throughout.
- 6.4.3 There are six statutory sites for nature conservation within the study area for ecology, these are illustrated in **Figure 8-1** of the ES [EN010118/APP/6.3]. The River Ter Site of Special Scientific Interest (SSSI) is the closest and is located immediately adjacent to the Order limits, with an undesignated section of the River Ter bisecting the northern part of the Order limits.
- 6.4.4 There are 31 non-statutory sites designated for nature conservation within 2km of the Order limits. These sites have been designated as Local Wildlife Sites (LoWS) for their biodiversity value at a county level and are known to have supporting value to a wide variety of protected and ecologically important species and /or habitats. The locations of these non-statutory sites are shown in **Figure 8-2** of the ES [EN010118/APP/6.3]. Boreham Road Gravel Pits LoWS is located within the Order limits.
- 6.4.5 The following protected species surveys were also carried out following a Phase I Habitat Survey: terrestrial invertebrates, fish, breeding birds, wintering birds, bats, reptiles, badger, otter, other mammals, and botanical.

Assessment of Effects

- 6.4.6 Whilst there is the potential for effects upon ecological receptors during construction, mitigation measures designed to prevent adverse impacts upon ecological receptors will be embedded in the Scheme, including measures within the **OCEMP** [EN010118/APP/7.10] and **OLEMP** [EN010118/APP/7.13]. These include improving ecological connectivity and

the creation of habitat to mitigate and compensate for habitat loss during construction and operation of the Scheme. A Biodiversity Net Gain report has been prepared with the ES (**Appendix 8N: Biodiversity Net Gain Report [EN010118/APP/6.2]**); and sets out how the Scheme delivers well in excess of the required 10% net gain, with a figure of 79% net gain for habitats and 20% for hedgerow habitats.

- 6.4.7 Following implementation of embedded and standard mitigation measures, the effect of the temporary loss of habitat within Boreham Road Gravel Pits LoWS (which will be restored post-construction) will result in a temporary **minor adverse** effect, that is considered **not significant**.
- 6.4.8 The loss of small sections of existing hedgerow as a result of construction activities will result in a temporary **negligible** effect that is considered to be **not significant**. The majority of hedgerows across the Scheme will be avoided and any replanting required has been embedded within the Scheme design for creation of hedgerows. Once hedgerows establish along with additional hedgerow planting proposed across the Site, the Scheme will deliver a net gain in this habitat and the overall impact will have a **beneficial** effect that is considered **significant**.
- 6.4.9 Temporary loss of habitat used by the breeding bird assemblages across the Order limits has been assessed as a **minor adverse** effect, and **not significant**. The Scheme retains key areas for breeding birds across the Order limits both within existing areas, but also by ensuring the majority of boundary features (hedgerows, trees and woodland) are retained and protected during construction. Once habitats are established the Scheme will be able to deliver a net gain in habitats required to support a diverse breeding bird assemblage similar to that currently present, but at an increased population size and the overall impact will be beneficial.
- 6.4.10 Disturbance to breeding Red Kite, Hobby and Barn Owl is predicted to be **negligible**, and **not significant**. Pre-commencement surveys for sensitive breeding birds, will be undertaken in advance of construction works commencing and implemented through the **OCEMP [EN010118/APP/7.10]**. Additional mitigation/ enhancement will also include the provision of a minimum of five barn owl boxes within and adjacent to the Order limits to provide alternative nesting/ roosting provision for barn owl across the Order limits.
- 6.4.11 The construction and operation of the Scheme will not lead to any significant effects on other protected species or important ecological features.
- 6.4.12 During operation, the Scheme has been designed to integrate with the local green infrastructure network, improving ecological and recreational connectivity across the Order limits. New planting will include:
- a. 8.6km of new native hedgerows with hedgerow trees;
 - b. 20.6km of native hedgerow enhancement - gapping up and infill planting;
 - c. Approximately 200 new individual trees;

- d. 23.2ha of land for natural regeneration;
- e. Over 3ha. of new native woodland buffer planting measuring 25m wide to form ecological corridors between existing woodlands;
- f. 0.6ha. of native linear tree belts measuring 15m wide;
- g. A new north/south green route, via a new permissive path;
- h. 272ha. of new species rich grassland below solar arrays;
- i. 131ha. of new species rich grassland in open areas; and
- j. 42km of species rich mown grassland around the perimeter of proposed solar arrays.

6.4.13 The effects of decommissioning of the Scheme are likely to be similar to those for construction. Taking into account that relevant legislation and policy will need to be adhered to when decommissioning takes place and appropriate measures will be put in place to monitor and manage this the impact of decommissioning activities on important ecological features has been assessed as temporary **low adverse**, which results in a temporary **minor adverse** effect, that is considered **not significant**.

Mitigation Measures

- 6.4.14 The **OCEMP [EN010118/APP/7.10]** will be in place during construction to mitigate construction-related effects on biodiversity. Similarly, the Outline Operational Environmental Management Plan (OOEMP) **[EN010118/APP/7.11]** and Decommissioning Strategy **[EN010118/APP/7.12]** set out measures to mitigate operational and decommissioning related effects on biodiversity, respectively.
- 6.4.15 An **OLEMP [EN010118/APP/7.13]** is also provided as part of the Application. This will present measures for the protection of ecological receptors; against which a detailed LEMP will be brought forward.
- 6.4.16 At this stage, it is predicted that the Scheme design has embedded sufficient mitigation to avoid significant adverse effects to important ecological features, without additional mitigation measures being required. EIA is an iterative process, and should further mitigation be identified, e.g., if ongoing ecological surveys determine other impacts, then the Scheme design will look to capture these.
- 6.4.17 The Scheme will seek to deliver significant gains for biodiversity in line with national and regional policies and biodiversity priorities. These enhancements will also be based on consultation responses as the Scheme progresses. A monitoring programme will also be defined in the DCO submission to ensure mitigation and enhancement measures are delivered successfully.

6.5 Water Environment

Baseline and Context

- 6.5.1 **Chapter 9: Water Environment** of the ES **[EN010118/APP/6.1]** assesses the potential impacts and effects of the Scheme on surface waterbodies (e.g.,

rivers, streams, ditches, and ponds) including water quality, hydromorphology, flood risk, drainage and water resources during construction, operation, and decommissioning. It also considers potential effects on hydrogeology, with land quality and ground condition issues discussed in **Chapter 16: Other Environmental Topics [EN010118/APP/6.1]**.

- 6.5.2 The Order limits are located within the Anglian River Basin District, Essex Combined Management Catchment, and Chelmer Operational Catchment. There are three WFD designated watercourses within the study area; the River Ter, River Chelmer and Boreham Tributary (also known as Boreham Brook).
- 6.5.3 In addition to the WFD designated River Ter, River Chelmer and Boreham Tributary, there are several undesignated tributaries of these waterbodies present within the Order limits. These are predominantly unnamed agricultural ditches, drains and springs some of which provide connectivity between the Scheme, the River Ter, and Boreham Tributary.
- 6.5.4 The topography of the study area (which is approximately 1km around the Order limits) is shaped by the River Ter catchment, which flows west to east through the northern extent of the Scheme. The land use within the study area is generally a mosaic of arable fields and woodland with several small ponds and springs scattered across the site with some larger still water waterbodies present to the south and south-west between Russell Green and Boreham. These are beyond the Order limits and generally follow the course of the Boreham Tributary.
- 6.5.5 There are also numerous ponds and still waters located across the Order limits along with a collection of former gravel pits to the west of the Order limits associated with quarrying activity (e.g., Bulls Lodge quarry).
- 6.5.6 A total of 97 ponds have been identified within 500m of the Order limits, with 23 of these located within the Order limits (see **Chapter 8: Ecology** of the ES [EN010118/APP/6.1]).
- 6.5.7 The bedrock under the Order limits consists of London Clay Formation – clay, silt and sand of sedimentary origin and is classified as unproductive strata. The superficial deposits are a mixture of Lowestoft Formation (diamicton), Brickearth (clay, silt and sand), glaciofluvial deposits (sand and gravel), alluvium (clay, silt, sand and gravel), and head deposits (clay, silt and sand).

Assessment of Effects

- 6.5.8 Environmental considerations were taken into account during the design of the Scheme in order to avoid and/or reduce potential impacts on water environment receptors.
- 6.5.9 The majority of construction works across the Order limits are distant from watercourses and on relatively flat topography. As such, the risk to watercourses from construction activities is considered generally low. The greater risks of adverse impacts are where direct works are required within a watercourse.

- 6.5.10 A number of embedded measures have been identified, which would be implemented during construction to manage the impacts and reduce the effects that the construction of the Scheme would have on the water environment. An **OCEMP [EN010118/APP/7.10]** has been prepared and the measures within that document include managing flood risk and also the risk of pollution to surface waters and the groundwater environment.
- 6.5.11 Following the implementation of the embedded mitigation set out in the ES, including measures secured via the **OCEMP [EN010118/APP/7.10]**, the effects for surface water, groundwater, or flood risk during construction are considered **negligible, slight adverse, neutral or no change**, and therefore **not significant**.
- 6.5.12 During the operational phase, there is the potential for adverse impacts without adequate mitigation, including impacts on water quality in waterbodies that may receive surface runoff or be at risk of chemical spillages from supporting infrastructure for the Scheme.
- 6.5.13 Following the implementation of mitigation (secured as necessary e.g., via the SuDS Strategy (**Appendix 9C** of the ES [EN010118/APP6.2]), the Bulls Lodge Substation Extension: Drainage Strategy (**Appendix 9D** of the ES [EN010118/APP6.2]) and the Design Principles [EN010118/APP/7.3]), the effects for surface water, groundwater or flood risk during operation are considered **negligible, slight adverse, neutral or no change** and therefore **not significant**.
- 6.5.14 Potential impacts from the decommissioning of the Scheme are similar in nature to those during construction, as some groundwork would be required to remove infrastructure installed, although it is not proposed that cables installed beneath watercourses would be removed but that they would remain in situ. A Decommissioning Strategy [EN010118/APP/7.12] has been prepared to identify required measures to prevent pollution and flooding during this phase of the development.
- 6.5.15 As a result, it is considered the decommissioning impacts and effects would be similar to the type and scale of those described for the construction phase.

Mitigation Measures

- 6.5.16 The Scheme has been designed, as far as possible, to avoid and minimise impacts and effects on the water environment through the process of design development, and by embedding measures into the design of the Scheme. The Flood Risk Assessment (FRA) includes a full review of the flood risk to the Order limits and identifies measures to mitigate flood risk from all sources.
- 6.5.17 The embedded measures would be implemented during construction to manage the impacts and reduce the effects that the construction of the Scheme on the water environment. These include the use of the CEMP and avoiding construction activities in areas of higher risk of flooding, where practicable. An outline drainage strategy has been prepared to support the Application (see **Appendix 9B: Outline Drainage Strategy and Appendix 9D: Bulls Lodge Substation Extension: Drainage Strategy** of the ES

[EN010118/APP/6.2]). The drainage strategy has been developed to mimic natural drainage as far as practicable using Sustainable Urban Drainage Systems (SuDS), and to provide a number of other benefits to ecological habitat creation.

- 6.5.18 Design mitigation measures for the operational phase of the Scheme include minimum buffers of 8m around watercourses, 10m around main rivers, and 5m around the margin of ponds, as set out within the Design principles **[EN010118/APP/7.3A]**. The Scheme is mostly located within a low flood risk area (Flood Zone 1), and the minimum height of the lowest part of the solar PV Panels will be 0.6m above ground level.
- 6.5.19 There are considered to be no significant residual effects for surface water, groundwater or flood risk during the construction, operation, and decommissioning phases of the Scheme.

6.6 Landscape and Visual Impact Assessment

Baseline and Context

- 6.6.1 **Chapter 10: Landscape and Visual** of the ES **[EN010118/APP/6.1]** presents the findings of an assessment of the potential significant effects on the existing landscape, designations, and views, which have been identified as part of the baseline. Landscape effects relate to changes to the landscape as a resource, including physical changes to the fabric or individual elements of the landscape, its aesthetic or perceptual qualities and landscape character. Visual effects relate to changes to existing views of identified visual receptors ('people'), from the loss or addition of features within their view due to the Scheme.
- 6.6.2 The Landscape and Visual Impact Assessment identifies the sensitivity and overall significance of landscape and visual effects within the identified study area. The landscape and visual baseline assessments have been based on desk study and field work, during both winter and summer between May 2020 and October 2021.
- 6.6.3 Landscape receptors of the Scheme include: National Character Area (NCA) 86 (South Suffolk and North Essex Clayland), which covers the whole of the Order limits, other than the southernmost section; and the NCA 111 (Northern Thames Basin) which covers the southernmost section of the Order limits. A number of regional, county and local landscape receptors were also identified as part of the baseline. Visual receptors in the area include recreational users, residents, visitors to the area, and motorists using the highway network.

Assessment of Effects

- 6.6.4 Embedded mitigation has been included within the Scheme design to reduce the landscape and visual effects of the Scheme. Areas of planting and positioning of the Scheme have been designed around the following principles:
- a. Careful siting of the Scheme within the landscape;

- b. Conserving landscape, ecology and archaeological features across the Order limits; and
 - c. Creating new planting and vegetation for screening within the Order limits.
- 6.6.5 Effects from the construction phase are expected to include changes in surface landform, landcover, presence of construction machinery and the associated activity which is required to implement the Scheme.

Construction Phase

- 6.6.6 At a county level, construction would result in **no significant** effects to the Landscape Character Areas (LCAs). This is due to the construction activity being limited to a relatively small geographic area in relation to the wider extent of the published LCAs. The level of effect would range from **minor adverse** to **neutral** and is considered to be temporary and short term.
- 6.6.7 At a district level, there would be the perception of construction activity in the parts of the Landscape Character Areas (LCAs) adjacent to the Order limits, reducing the level of tranquillity locally. Construction would result in a **minor adverse** effect, which is considered **not significant**, effects will be temporary and lasting only for the duration of the construction works.
- 6.6.8 Construction would result in **negligible adverse** or **neutral** effects on the remaining district level Landscape Character Areas (LCAs). This is considered **not significant**.
- 6.6.9 The Order limits is located in Local Landscape Character Area (LLCA) 02: Western Farmland Plateau and Local Landscape Character Area (LLCA) 07: Toppinghoehall Woods. At the local level, construction is anticipated to result in **moderate adverse effects** to Local Landscape Character Area (LLCA) 02 and 07, which are considered **significant** albeit temporary, only lasting for the duration of the construction works.
- 6.6.10 Construction activities are expected to result in **major** or **moderate adverse** visual effects for residential receptors in close proximity to the Order limits. These effects are considered to be **significant**. This would result from the introduction of construction activity at close range across a wide extent of a view and is inevitable due to the introduction of construction equipment into the Order limits.
- 6.6.11 Residential (and recreational) views from the south east of the Order limits would experience a minor adverse effect during construction. However, if the BESS is constructed in a single phase (which is not expected) the level of effect experienced may increase to **moderate adverse**, which would then be considered **significant**.
- 6.6.12 Residential receptors set back from the Order limits located in Gambles Green, Flacks Green and Terling, and residents located on the western side of Boreham Road and Waltham Road, would experience minor, neutral or negligible effects which are **not significant** as a result of construction.

- 6.6.13 People walking on the Essex Way, which is located outside the Order limits but with views into it, would experience **adverse** effects of **moderate** significance, resulting from construction from locations west and south of Fuller Street. These effects are considered to be **significant**. However, users of other sections of the route, such as within the River Ter Valley from the north east of the study area, would experience effects which are **not significant**, due to the enclosed landform and intervening vegetation.
- 6.6.14 People walking on the local public rights of way network within the Order limits would typically experience **major to moderate adverse** effects, which are considered to be **significant**. These effects would result from the introduction of construction activity at close range across a wide extent of a view.
- 6.6.15 People walking on the wider public rights of way network beyond the Order limits would experience effects which are **not significant** due to the intervening landform and vegetation.
- 6.6.16 Views of construction from the local road network to the west of the Order limits would typically be screened by dense vegetation that flanks the road corridor. Occasional views of construction would be available through gaps in vegetation, but they would be fleeting and oblique to the direction of travel. Where more open views from the road network are available, such as from the south of Terling Hall Road, construction would be set back from the road corridor and visual receptors would experience neutral, negligible or minor effects at different locations, which are **not significant**.

Operational Phase (Winter Year 1 – 2027)

- 6.6.17 Operational phase impacts have been assessed in both the first year during winter (when there are no leaves on vegetation) and in Year 15 during summertime (best case, after planting has established), in line with the requirements set out in professional guidance.
- 6.6.18 The operation of the Scheme during winter of the first year would result in **no significant** effects to the Landscape Character Areas (LCAs) defined at the County level. The level of effect would range from **neutral** to **negligible adverse**, which is **not considered significant**.
- 6.6.19 Operation would result in **neutral** effects to the remaining district level Landscape Character Areas. This is considered to be **not significant**.
- 6.6.20 At a local level, the operational phase of the Scheme would result in a **moderate adverse** effect to Landscape Character Area LLCA 02, which is considered **significant**.
- 6.6.21 During operation, the Scheme would result in a **moderate adverse** effect to Landscape Character Area LLCA 07, due to the location of the BESS and Longfield Substation. This is considered **significant**.
- 6.6.22 Operation would result in **minor adverse** or **to negligible adverse** effects on the remaining local level Landscape Character Areas (LLCAs). This is considered **not significant**.

- 6.6.23 Residential receptors with open views in close proximity to the Order limits would typically experience **moderate adverse** effects, considered to be **significant**, during year 1 of operation.
- 6.6.24 Residential receptors with open views in close proximity to the Order limits would typically experience **moderate adverse** effects, considered to be **significant**, during year 1 of operation. The Scheme layout includes an offset from residential properties and proposes mitigation planting, but this would not be established at Year 1. Therefore, the proposed solar panel arrays would be prominent in views of residents on Noake's Lane, the western side of Terling Hall, the edge of Fuller Street, the eastern side of Waltham Road/Boreham Road and Fairstead lodge, located to the north of the Order limits.
- 6.6.1 Advanced Mitigation Planting has been introduced to the Scheme in order to reduce the duration for which residents experience significant adverse effects. Based on the average rates advanced planting would mitigate significant effects by:
- Residents of Noake's Lane: Year 4 of operation
 - Western side of Terling Hall Road: Year 6 of operation
 - Edge of Fuller Street: Year 4 of operation
 - Eastern side of Waltham Road/Boreham Road: Year 6 of operation
 - Residents living within the Order limits: Year 4 of operation
- 6.6.2 Residential receptors set back from the Order limits located in Three Ashes Farm, Fairstead, Troys Hall, Sandypits Farm, Wat Hobb's Farm, Gambles Green, Flacks Green and Terling, Ringers Farm, Hatfield Peverel, Little Baddow, Boreham, properties east of Lyonshall Wood, Lyons Hall and Ranks Green, would experience neutral effects which are **not significant**.
- 6.6.3 People walking on the Essex Way would experience **moderate adverse** effects from locations west and south of Fuller Street and from the edge of Sandy Wood during the 1st year of operation of the Scheme. These effects are considered to be **significant**. However, other sections of the route, such as within the valley of the River Ter from the north east of the study area, would experience **no significant** effects.
- 6.6.4 During the operational phase, recreational receptors walking on the local public rights of way network within the Order limits would typically experience **major to moderate adverse** effects, considered to be **significant**. This would result from the introduction of solar arrays at close range. The proposed Longfield Substation, BESS and Bulls Lodge Substation Extension would not be visible from close range.
- 6.6.5 People walking on the wider public rights of way network beyond the Order limits during year 1 of operation would experience **no significant** effects due to intervening landform and vegetation.

Operational Phase (Summer Year 15 – 2042)

- 6.6.6 Following the establishment of the planted vegetation in Year 15 and considering the benefit of summertime leaf, the Scheme is anticipated to result in **no significant** effects to the Landscape Character Areas (LCAs) defined at the County level. The level of effect would range from **negligible adverse** to **neutral**.
- 6.6.7 The Scheme is expected to result in **no significant** effects to the Landscape Character Areas (LCAs) defined at the District level. The level of effect would range from **minor** adverse to **neutral**. The proposed planting and existing deciduous vegetation would be in leaf. New and strengthened hedgerows would be maintained at 3m tall. This would screen or filter the Scheme in the majority of views.
- 6.6.8 The new planting would be offset from the boundary of residential properties. The planting would be maintained at 3m tall and would therefore screen the built elements of the Scheme in most views, given the relatively flat landform across the majority of the Order limits.
- 6.6.9 The establishment of new planting would change the composition of some residential views, screening agricultural fields that typically form the middle ground. However, the offset from curtilage boundaries and maintaining a vegetation height of 3m would retain a sense of openness in the view. The native, locally characteristic species proposed would be in keeping with the style of vegetation in the existing views, following the same form and composition. No residential receptors with open views in proximity to the Order limits or set back from the Order limits in the surrounding settlements have been identified as experiencing significant adverse effects at year 15.
- 6.6.10 People walking on the Essex Way would experience **minor adverse** effects, which are considered to be **not significant**. The level of effect is reduced from Year 1 because existing vegetation established planting would be in leaf. This would filter views of the PV Arrays such that the Scheme would be unobtrusive.
- 6.6.11 Within the Order limits, people walking on Public Rights of Way (PRoW) 213_19 and PRoW 113_25 would experience **major adverse** effects, because of close range views of the proposed PV Arrays in the immediate foreground. These effects are considered **significant**.
- 6.6.12 People walking on the wider public rights of way network beyond the Order limits boundary would experience **no significant** effects resulting from operation during year 15.
- 6.6.13 The establishment of the proposed planting would further reduce the visibility of the Scheme from the road network. There would be **no significant** effects experienced by road users at year 15 of operation.

Decommissioning (2066 to 2067)

- 6.6.14 At a County and District level, decommissioning would result in **no significant** effects to the Landscape Character Areas. The level of effect would range from **neutral to negligible adverse**
- 6.6.15 The planting embedded in the Scheme design would be mature and would not be removed during decommissioning. Upon decommissioning, the above-ground physical infrastructure at the Solar Farm Site will be removed and the Solar Farm Site returned to the landowner. This will include the areas of agricultural land where the agricultural resource has been maintained (and potentially improved) during operation, and the established habitats. Post-decommissioning, the landowner may return the Solar Farm Site to arable use, although it is assumed that established habitats such as hedgerows and woodland would be retained. Therefore, during decommissioning the effects on Local Landscape Character Areas would be **neutral to minor adverse**. These effects are considered to be **not significant**.
- 6.6.16 Existing and proposed planting would screen views of decommissioning at ground level in close proximity to residential receptors, however the top of equipment would likely be visible. Given the level of screening and the short-term duration of the effect, decommissioning would result in **minor adverse** effects for residential receptors in proximity to the Order limits, which are **not significant**.
- 6.6.17 **No significant** effects would be experienced by residential receptors set back from the Order limits.
- 6.6.18 Views of decommissioning from the Essex Way would be screened by proposed and existing vegetation such that the activity would be unobtrusive and therefore the resulting effects are considered to be **not significant**.
- 6.6.19 People walking on Public Rights of Way (PRoW) 213_19 within the Order limits would experience **moderate adverse** effects due to close range views of decommissioning. These effects are considered to be **significant**, albeit short term, lasting only a number of weeks.
- 6.6.20 People walking on PRoW 213_18 and PRoW 113_25 within the Order limits would experience **major adverse** effects due to close range views of decommissioning. These effects are considered to be **significant**, albeit short term, lasting only a number of weeks.
- 6.6.21 People walking on the wider PRoW network beyond the Order limits would experience **non-significant** effects resulting from decommissioning since views would be screened or heavily filtered by intervening vegetation.
- 6.6.22 The activity of decommissioning would be similar to construction for road users. As for the construction phase, there would be **no significant** effects on road users resulting from decommissioning.

Mitigation Measures

- 6.6.23 The Scheme has been designed, as far as possible, to avoid adverse effects on the landscape and views through a series of design iterations to embed mitigation measures into the design, including using lower height PV panels and mounting structures (onto which the panels are attached) in areas with greater sensitivity.
- 6.6.24 The Scheme has been designed to integrate with and enhance the local green infrastructure network, improving ecological and recreational connectivity across the Order limits. The proposed planting design has responded to the varied character by allowing views to remain open, where tall screening would not be appropriate. New planting would include:
- a. 8.6km of new native hedgerows with hedgerow trees;
 - b. 20.6km of native hedgerow enhancement - gapping up and infill planting;
 - c. Approximately 200 new individual trees;
 - d. 23.2ha of land for natural regeneration;
 - e. Over 3ha. of new native woodland buffer planting measuring 25m wide to form ecological corridors between existing woodlands;
 - f. 0.6ha. of native linear tree belts measuring 15m wide;
 - g. A new north/south green route, via a new permissive path;
 - h. 272ha. of new species rich grassland below solar arrays;
 - i. 131ha. of new species rich grassland in open areas; and
 - j. 42km of species rich mown grassland around the perimeter of proposed solar arrays.
- 6.6.25 The layout of the Scheme has been designed to minimise the loss of, and avoid significant impacts on, existing landscape features. With reference to the Works Plans this includes minimum offsets of:
- a. 15m from ancient woodland;
 - b. 15m from other woodlands;
 - c. 15m from hedgerows;
 - d. 15m from individual trees
 - e. 10m from existing ponds; and
 - f. 8m from the River Ter.
- 6.6.26 The residual significant landscape and visual effects are due to the change in land use and the massing of the panels and associated structures. Whilst long term, the residual significant effects would be temporary. It would not be possible to mitigate every adverse effect due to the requirements of the Scheme. Since all mitigation is embedded in the Scheme, no additional mitigation measures are proposed. The **OLEMP [EN010118/APP/7.13]** sets out measures to provide long term environmental management and enhancement to the landscape within the Order limits.

6.7 Noise and Vibration

Baseline and Context

6.7.1 **Chapter 11: Noise and Vibration** of the ES [EN010118/APP/6.1] presents the findings of an assessment of the potential significant effects of the Scheme on noise and vibration of the Order limits and surrounding area. Baseline noise monitoring was carried out to establish the existing noise climate in the area. Sensitive receptors to noise which have the potential to be affected by the Scheme were identified.

6.7.2 During the surveys the dominant noise source at the majority of the locations was observed to be road traffic from the surrounding road network, particularly at locations near to the A12. At more distant monitoring locations, noise from the A12 was less audible although noise from passing vehicles on nearby roads was still observed.

Assessment of Effects

6.7.3 Construction noise levels are predicted to be at their highest during site preparation and civil phases of works, which include ground works and piling activities. The duration of any construction noise effects is considered to be temporary, short-term, with no permanent residual effect once works are completed. Working hours during construction will be from 7am to 7pm Monday to Saturday, with worker trips the hour before and after the core working hours. It is considered that noise impacts are likely to be greatest during the early stages of the works programme, where ground works are required. In practice, works noise levels and resulting impacts are likely to vary during the different construction phases. The nature of construction work means that the highest levels of noise may exist for only a matter of days or even hours and there would be regular periods, even during the course of a single day, when the assumed noisy plant will not be in operation during breaks or changes of working routine. Construction noise levels will be controlled through the use of embedded mitigation and the use of a CEMP.

6.7.4 Examples of best practicable means that will be implemented during construction works to control noise and vibration, include:

- a. Ensuring that all appropriate processes, procedures and measures are in place to minimise noise before works begin and throughout the construction programme;
- b. All contractors to be made familiar with current legislation and the guidance in BS 5228 (Parts 1 and 2) which should form a pre-requisite of their appointment;
- c. Ensuring that, where reasonably practicable, noise and vibration is controlled at source (e.g., the selection of inherently quiet plant and low vibration equipment), review of the construction programme and methodology to consider quieter methods, consideration of the location equipment on-site and control of working hours;
- d. Use of modern plant, complying with applicable UK noise emission requirements;

- e. Hydraulic techniques for breaking to be used in preference to percussive techniques, where reasonably practicable; and
 - f. Drop heights of materials will be minimised.
- 6.7.5 The Design Principles of the Scheme has incorporated measures such as distancing of inverters away from sensitive receptors, and locating the BESS compound in an area away from large concentrations of receptors as well as towards the A12 where existing ambient noise levels are higher (such that operational noise emissions from the BESS are less impactful). Similarly, the Bulls Lodge Substation Extension is located close to existing noise sources (the existing Bulls Lodge Substation, nearby quarrying works, other operational infrastructure, the A12 and the railway).
- 6.7.6 For the purposes of providing an assessment of likely significant noise effects the Study Area for the noise assessment has been determined by receptors within 500m of the Order limits boundary. It is considered that receptors at greater distances will experience negligible noise and vibration effects from the Scheme; this is confirmed by the modelling output and concussions presented in **Chapter 11: Noise and Vibration** of the ES [EN010118/APP/6.1]. The identified noise-sensitive receptors are presented in **Figure 11-1** of the ES [EN010118/APP/6.3]. These receptors have been determined through desktop study during the scoping process and confirmed during site visits.
- 6.7.7 The locations of these receptors have been considered in both the construction and operational noise assessments and are considered representative of adjacent properties. There are a few individual residential properties within close proximity of the Order limits, some of which are within 10m of the Order limits along Terling Hall Road and Waltham Road. The closest cluster of residential properties is located 300m away from the Order limits boundary on Braintree road near Fuller Street.

Construction and Decommissioning Phase

- 6.7.8 The overall impact of construction works noise has been assessed as long-term temporary and low **adverse**, which results in a temporary **minor** effect, which is considered **not significant**.
- 6.7.9 Vibration levels from activities (including on-site works and construction Heavy Goods Vehicles (HGV) traffic) are below the level at which there is any potential for cosmetic damage to structures and as such are predicted to result in a **negligible** effect which is **not significant**.
- 6.7.10 It is considered that any periods of construction vibration experienced at a receptor would unlikely exceed one month, with no permanent residual effect once works are completed. As such, any construction vibration effects are considered to be short-term in duration.
- 6.7.11 The impact of construction works traffic noise has been assessed as long-term temporary and very low, which results in a temporary **negligible** effect, which is considered **not significant**.

Operational Phase

- 6.7.12 For the assessment of operational noise during the daytime (07.00 to 23:00), the typical background level has been defined from a Sunday daytime period with lower noise levels compared to a weekday or Saturday, as to provide a worst-case assessment scenario. It has been assumed that all plant is in operation continuously during the daytime at maximum sound power levels.
- 6.7.13 Operational noise impacts at all receptors are assessed to be limited to a permanent very low to low impact, which results in a temporary **negligible** or **minor** effect, which is **not significant**.

Mitigation Measures

- 6.7.14 At this stage no additional mitigation, enhancement or monitoring measures for the construction/decommissioning phases are considered to be required given that no significant adverse effects have been predicted. A construction noise monitoring scheme shall be developed as per requirements of the **OCEMP [EN010118/APP/7.10]** following appointment of a principal contractor and prior to commencement of construction works. Requirements for monitoring during the decommissioning stages will be outlined in the **Decommissioning Strategy [EN010118/APP/7.12]**.
- 6.7.15 No significant adverse effects due to operational phase noise and vibration have been identified. The Concept Design shows an acoustic barrier at the west-end of the BESS, which was not accounted for in noise predictions. The purpose of this fence is to screen plant noise for users of the PRow. The effect of screening provided by this barrier is illustrated in **Figure 11-4** of the ES and demonstrates how the barrier, in combination with screening provided at the nearby solar station, can reduce noise at the PRow. Although, an acoustic barrier is necessary to achieve the target level of noise in the concept design, other future designs may require alternative mitigation or potentially no mitigation if quieter equipment is used. The Acoustic barriers may comprise close-boarded impervious wooden fencing or a similar construction, which will be confirmed during detailed design.
- 6.7.16 It is considered that through the use of further mitigation measures (e.g. selection of quieter plant, positioning of noise-emitting equipment away from sensitive receptors, and the use of enclosures, louvres and/or acoustic barriers around inverters and Battery Energy Storage System (BESS) (cooling fans), operational noise from associated solar farm plant will result in no significant residual adverse effects. The residual effects are therefore **minor** adverse.
- 6.7.17 It is acknowledged that the DCO allows flexibility for the location of solar stations, such that the finalised locations may be closer to receptors. Any changes to the Scheme that result in solar station being located closer to receptors will be assessed during the detailed design. Where necessary, mitigation measures will be provided to ensure noise at receptor locations is within Design Principle limits.

6.8 Socio-economic and Land Use

Baseline and Context

- 6.8.1 **Chapter 12: Socio-Economics and Land Use** of the ES [EN010118/APP/6.1] presents the findings of an assessment of the likely significant effects on socio-economics and land use as a result of the Scheme.
- 6.8.2 In order to assess the potential effects of the Scheme, the environmental conditions, resources and sensitive receptors that currently exist in the Study Area have been determined. These include:
- a. The existing Order limits and land use, including development land;
 - b. Agricultural land resource;
 - c. Population and labour force;
 - d. The local economy;
 - e. Public Rights of Way;
 - f. Residential Properties;
 - g. Business Premises; and
 - h. Community Facilities.
- 6.8.3 The baseline conditions are summarised in the sections below.

Agricultural land and soils

- 6.8.4 The baseline conditions for land quality are presented in the Agricultural Land Classification (ALC) report, which is presented in **Appendix 12A: ALC Survey Report** of the ES [EN010118/APP/6.2]. The Agricultural Land Classification (ALC) survey was undertaken on the proposed site boundary at the EIA Scoping stage.
- 6.8.5 The agricultural land is graded on a sliding scale, with Grade 1 representing the best quality agricultural land, and Grade 5 being the least favourable.
- 6.8.6 The agricultural land quality (ALC) survey has been undertaken of 454 ha of land north-east of Chelmsford within the Order limits. Of the 454 ha of land, no Grade 1 land is present. Approximately 55ha, 12% of the Order limits is comprised of Grade 2 land. Subgrade 3a land comprises 22% or approximately 101ha of the land in the area surveyed, and Subgrade 3b covered approximately 262ha which makes up the majority of the land within the Order limits (58%). The remaining area is classified as non-agricultural land.

Population

- 6.8.7 The residential population of the study area increased from 7,577,075 in 2012 to 8,157,694 in 2020. This represents an increase of 7.7%, which is slightly greater than the population increases that are recorded in the East region (6.2%) and England and Wales as a whole (5.6%) over the same time period. According to the Office for National Statistics (ONS) Population Estimates, in 2020, 62.9% of residents within the 60-minute travel study area were of working age (defined by ONS as men and women aged between 16 and 64). This is broadly in line with the rates recorded for the East region (60.6%) and England and Wales as a whole (62.2%).

Employment

- 6.8.8 According to the ONS Census 2011, the unemployment rate among working age residents (age 16-74) in the study area was 4.6%, which is broadly in line with the recorded rate across England and Wales (4.4%), but slightly higher than is recorded in the East of England region (3.8%). Residents of working age residing in the study area had an economic activity rate of 71.2% in line with rates recorded for East of England (71.6%) and for England and Wales (69.7%).

Qualifications and occupational profile

- 6.8.9 According to 2011 Census data, 28.1% of working age residents within the study area had a degree level qualification or higher (National Vocational Qualification [NVQ] Level 4+). This was above the rates recorded for the East of England region (25.7%) and England and Wales as a whole (27.2%).
- 6.8.10 According to 2011 Census data, the proportion of residents in the study area with no qualifications was 21.6%, which was slightly lower than rates recorded for the East of England region (22.5%) and England and Wales as a whole (22.7%).
- 6.8.11 According to 2011 Census data, the proportion of residents in the study area engaged in level 3 and 4 (Standard Occupation Classification (SOC) 3) occupations (26.3%) was higher than that recorded for the East of England region (24.9%) and England and Wales (24.1%). The proportion of residents in the study area in elementary occupations (10.3%) was slightly lower than rates in the East of England region (10.6%) and England and Wales (11.1%).

Deprivation

- 6.8.12 Based on the 2019 Indices of Multiple Deprivation (IMD), Braintree District Council is the 211th most deprived out of the 326 national boroughs. Chelmsford is less deprived than Braintree ranking 253rd out of the 326 national boroughs. None of the LSOAs in Chelmsford are within the top 10% deprived boroughs in the country for the IMD indicator.

Local Economy

- 6.8.13 The construction sector contributes 7% of employment within the social-economic study area, which is in line with the proportions recorded regionally

and nationally. There are around 205,135 people employed in construction within the study area.

Assessment of Effects

Construction

- 6.8.14 The direct, indirect, and induced employment, expenditure and upskilling created from the construction of the Scheme must be judged in the context of the labour pool of construction workers in the study area (205,135 workers). Taking this into account, the impact of construction employment generation in the study area has been assessed as a temporary **moderate beneficial** effect. This is considered **significant**.
- 6.8.15 The impact of direct Gross Value Added (GVA) generation from the construction phase on the study area economy has been assessed as a temporary **moderate beneficial** effect. This is considered **significant**.
- 6.8.16 The impact on the national economy as represented by the total GVA generated has been assessed as medium-term temporary minor beneficial, which results in a temporary **minor beneficial** effect. This is considered **not significant**.
- 6.8.17 Temporary disruption to users making local journeys on public rights of way 213_21, 213_17 (northern option only), 213_20 (southern option only) and 213_19 would be experienced due to implemented diversions which are planned during cable installation. The temporary diversion routes may cause temporary disruption to users making local journeys on these PRow, possibly resulting in increased journey times. Owing to the scale of the additional journey length, impacts arising from this on user journeys are assessed to be a temporary **negligible** effect. This is considered **not significant**.
- 6.8.18 From the construction phase, temporary and permanent use of agricultural land will occur. The total area of agricultural land temporarily required from construction of the Scheme would be approximately 439ha. The area of land which would be required temporarily comprises approximately 150ha of Best and most Versatile (BMV) land, i.e., that classified in Grades 1, 2 and 3a, and as there is no land in Grade 1, the sensitivity is assessed to be medium. As the loss of the entire area of BMV agricultural land is reversible after operation and therefore temporary, the temporary effect of the Scheme on the use of BMV agricultural land is assessed to be **not significant**.
- 6.8.19 The total area of agricultural land permanently required from construction of the Scheme would be approximately 15ha. The area of land which would be required permanently comprises approximately 6ha of BMV land, i.e., that classified in Grades 1, 2 and 3a, and as there is no land in Grade 1, the sensitivity is assessed to be medium. Given the loss of the entire area of BMV agricultural land is less than 20ha the effect of the Scheme on BMV agricultural land is assessed to be **not significant**.
- 6.8.20 Construction of the Scheme may result in temporary effects on the amenity of residents, businesses, and users of PRow community facilities where these

lie in proximity to construction activities including construction traffic. Temporary traffic management will only be required in a limited location, at Waltham Road, for a short duration, in the form of a temporary lane closure or overnight road closure, which would minimise any impacts on residents and businesses. Taking into account the residual effect assessment results of the air quality, noise/vibration, traffic and transport and visual assessments relating to the construction activities, there are no receptors that would experience a significant effect on their amenity during construction, and as such there would be **no effect (not significant)**.

- 6.8.21 The majority of the Order limits is within a mineral safeguarding area (MSA). However, it is expected that no sterilisation of safeguarded mineral within the Order limits would result from the Scheme as the Order limits would be restored to agriculture after the operational life of the solar farm has ended and decommissioning is complete.
- 6.8.22 The Bulls Lodge Substation Site and the Grid Connection Route are located within a minerals consultation area (MCA) associated with Bulls Lodge Quarry, a consented minerals site, and are also part of the wider MSA. Land take from within the consented quarry will be needed permanently during and beyond the construction period of the Scheme to accommodate the Bulls Lodge Substation extension.
- 6.8.23 Construction of the Scheme at this location will also require temporary land take from extraction areas within the consented mineral site. This temporary land take will occur for approximately 24 months and is expected to commence not earlier than the first quarter of 2024 and be completed not earlier than the first quarter of 2026 covering approximately 140,000 square metres (sqm) of the consented mineral site. Although this land would not be able to be used during this period, it is not likely that it would be required for quarrying activity within this timeframe. The design of the Scheme has endeavoured to restrict land take that is required to continue beyond the construction period to areas outside of the consented limit of mineral extraction, as the electrical connection works are routed to avoid mineral extraction and stockpiling operations in the south-east corner of Brick Farm. This has minimised the impact of the Scheme on the quarry, however a small area of land within the consented extraction area is required permanently to house part of the extension to Bulls Lodge Substation. It is also possible that some limitations on quarry activities in land outside of the extraction area could be impacted by the cable route, which could (for example) limit the loading capacity of the land in this area. However, the Cable Route has been designed to minimise the potential for this impact. In particular, it has been routed to mostly avoid the consented mineral extraction site, and the potential overlap is very limited in extent. Further detail is given in the Mineral Infrastructure Impact Assessment which concludes that the construction and operation of the Scheme will not experience adverse effects a result of operations at Bulls Lodge Quarry, and vice versa.
- 6.8.24 Additionally, a designated coated stone extraction site is located nearby to the Bulls Lodge substation, however it is unlikely that there will be any interaction

between the Scheme and this location such that the activities at this location would be inhibited as a result of the Scheme, especially in view of the results of the assessment in **Chapter 13: Transport and Access** of the ES [EN010118/APP/6.1] that concludes that the extension to the existing Bulls Lodge Substation is not expected to result in any significant effects during the construction phase in terms of additional vehicle movements. Therefore, access to the coated stone extraction site is not expected to be inhibited by the shared use of access roads.

- 6.8.25 Overall, on the basis of the above and the conclusion of the Mineral Safeguarding Assessment, the magnitude of impact on the MSA is assessed to be low and the sensitivity of the resource is assessed to be low. Therefore, the overall effect of the Scheme on the MSA is assessed to be **negligible**, which is not significant.
- 6.8.26 Overall, on the basis of the above, the viability of the consented quarry would not be expected to be greatly impacted. As the land take required for the extension of the Bulls Lodge Substation has the potential to sterilise around 18,000sqm of consented mineral, which represents a small proportion of the consented mineral extraction area, the magnitude of impact is assessed to be low. This will not impact on the viability of the remainder of the consented reserve or significantly reduce the mineral supply in Essex. Given the thickness and distribution of mineral within the Order limits in these areas, prior extraction is unlikely to be either practical or economical. Thus, the magnitude of impacts arising from this on development land are assessed to be low and the sensitivity of the resource is assessed to be medium. Therefore, the overall effect of the Scheme on consented minerals sites and MCA are assessed as a **minor adverse** effect, which is not significant.
- 6.8.27 Boreham Recycling Centre, an existing waste site, is located within 250m of the Grid Connection Route. As there is no land take from Boreham Recycling Centre, and access to the waste safeguarding site would not be disrupted, **no effect** is expected.

Operation

- 6.8.28 The impact of operational employment generation in the local economy, would remain unchanged by the Scheme. Therefore, this results in a permanent **negligible effect**, which is considered **not significant**.
- 6.8.29 As the majority of the Order limits is available for some form of farming during operation, the impact on Agricultural Land would remain unchanged by the Scheme. Therefore, this results in a **negligible effect**, which is considered **not significant**.
- 6.8.30 Impacts on the amenity of nearby residents, businesses and users of community facilities during operation would remain unchanged by the Scheme. Therefore, this results in a **negligible effect**, which is considered **not significant**.
- 6.8.31 Impacts on the land take of development land affecting viability for future development of the land allocation would remain unchanged by the Scheme.

Therefore, this results in a **negligible effect**, which is considered **not significant**.

- 6.8.32 To the north-east of the Order limits there will be a new permissive footpath route for pedestrians and cyclists connecting Sandy Wood and PRow 113_33. This route will provide a safe and direct route from Boreham Road and Sandy Wood which connects with the existing PRow network in the area resulting in some reduction to local journey lengths. To the north-west of the Order limits there will be a new permissive footpath providing access from Boreham road to Terling Hall road and access towards PRow 213_4 near Ringer's Wood. This PRow will provide a safe route for the use of local residents in the area and connection between existing PRows in the area resulting in some reduction to local journey lengths. However, as these are not formal public rights of way with indefinite protection, the landowner has the ability to remove the permissive path following decommissioning of the Scheme, the impact is permanent low beneficial which results in a **minor beneficial effect**. This is considered **not significant**.

Decommissioning

- 6.8.33 The direct, indirect, and induced employment, expenditure and upskilling created from the decommissioning of the Scheme must be judged in the context of the labour pool of construction workers in the study area. The study area currently has around 2,280 workers in its construction sector. The impact of decommissioning employment generation in the local economy has been assessed as temporary medium beneficial, which results in a medium-term temporary **moderate beneficial effect**. This is considered **significant**.
- 6.8.34 The impact of employment loss in the local economy during the decommissioning phase during the long-term has been assessed as permanent very low adverse. This results in a permanent **negligible effect**, which is considered **not significant**.
- 6.8.35 Changes to journey times, local travel patterns and certainty of routes for users would arise from the temporary diversions of PRow. Most PRow within the Order limits will be unaffected during the decommissioning phase and there may be temporary diversions but no permanent closures. The new permissive routes will be in place for the lifetime of the Scheme and may be removed by following decommissioning if the landowner wishes. All other PRow will revert back to the original PRow network following decommissioning. Therefore, effects are only assessed for PRow that will experience temporary diversions. Owing to the limited scale of the additional journey length, impacts arising from this on user journeys of PRow are assessed to be temporary low adverse, which results in a temporary **negligible effect**. This is considered **not significant**.
- 6.8.36 Temporary disruption to agricultural land during decommissioning activities, followed by the return of BMV agricultural land for arable farming through completion of decommissioning would result in a temporary **negligible effect**. This is considered **not significant**.

- 6.8.37 Impacts on the amenity of nearby residents, businesses and users of community facilities during decommissioning would remain unchanged by the Scheme. Therefore, this results in a **negligible effect**, which is considered **not significant**.
- 6.8.38 Impacts on the land take of development land affecting viability for future development of the land allocation would remain unchanged during decommissioning of the Scheme. Therefore, this results in a **negligible effect**, which is considered **not significant**.

Mitigation Measures

- 6.8.39 There are no significant adverse residual effects assessed on Public Rights of Ways during the construction or decommissioning phases of the Scheme. The temporary closures will be supported by appropriate and clearly signed alternative routes and where possible will be planned and programmed to minimise disruption to users. No further mitigation measures are proposed. At ES stage suggested diverted routes will be identified in the assessment.
- 6.8.40 The significant adverse effect during construction on best and most versatile agricultural land cannot be mitigated further based on the proposed Scheme design. In the longer term however, the effect can be considered reversible as the Scheme will revert to agricultural land as has been confirmed in the assessment of decommissioning effects. No monitoring is therefore proposed.
- 6.8.41 The ES has concluded that there will be no other potential significant adverse socio-economic effects during the construction, operational or decommissioning phases of the Scheme and therefore no additional mitigation measures are required.
- 6.8.42 No other additional mitigation measures, over and above that stated in the other technical chapters, are required to avoid or minimise the socio-economic effects identified in this chapter.

6.9 Transport and Access

Baseline and Context

- 6.9.1 **Chapter 13: Transport and Access** of the ES [EN010118/APP/6.1] reports the findings of an assessment of the likely significant effects on traffic and transport as a result of the Scheme during the construction, operation and decommissioning. A detailed assessment of the operational impacts has been excluded from the ES due to the low number of trips associated with maintenance and operation (it is anticipated that there will be up to eight permanent staff on-site during the operational phase).

Strategic Highway Network

- 6.9.2 The A12(T) is a dual carriageway road which forms part of the Strategic Road Network (SRN) and is managed by National Highways. The A12(T) can be accessed via the B1137 Main Road, Boreham at Junction 19 (the Boreham Interchange), and / or the B1137 The Street, Hatfield Peverel at Junctions 20A and 20B (the Hatfield Peverel Interchange).

- 6.9.3 The A130 Essex Regiment Way is a dual carriageway road which links Little Waltham, north of Chelmsford, to the A131 in the north heading towards Braintree. The A130 is classified by Essex County Council as a Priority 1 Road (PR1) and provides access to Wheelers Hill, which joins with Leighs Road, Drakes Lane and Cranham Road to the east which provide access to both Boreham Road and Waltham Road. In the south the route links with the A1016 near Belstead Hall and with the A12(T) at the Boreham Interchange.
- 6.9.4 A plan showing the surrounding highway network is held within **Figure 13-1** of the ES [EN010118/APP/6.3].

Local Highway Network

- 6.9.5 The B1137 (Main Road) is a single carriageway road with footways along the majority of its length and street lighting provision within the villages of Boreham and Hatfield Peverel.
- 6.9.6 Waltham Road and Boreham Road are rural single carriageway roads and together connect Boreham in the south with Great Leighs in the north and serve a mixture of localised residential, leisure, agricultural, commercial and industrial land uses.
- 6.9.7 Waltham Road forms a priority junction with Cranham Road approximately 2.8km to the north of the B1137 Main Road junction.
- 6.9.8 Braintree Road runs to the north of the Order limits and is a rural single carriageway road which is accessed via Boreham Road at its western extent and serves the villages of Fuller Street and Terling.
- 6.9.9 Terling Hall Road runs along the eastern boundary of the Order limits and is accessed via the B1137 Main Road to the south, where there is a 12' 6" height restriction as the route passes underneath the railway line.
- 6.9.10 Generals Lane is located to the southwest of the Order limits and is a local road which is accessed via the Boreham Interchange. Generals Lane passes over the A12(T) and the Great Eastern Main Line (GEML) at which point it narrows providing priority to northbound road users. Generals Lane provides access to a private road (subject to a 30mph speed limit) which subsequently runs eastwards and provides access to the existing Bulls Lodge Substation. It is understood that the private road was previously upgraded to accommodate the works which were carried out when the substation was originally constructed.

Protected Lanes

- 6.9.11 The Chelmsford Local Plan 2013 - 2036 identifies a number of Protected Lanes and byways which are located near to the Order limits and have historic and landscape value. The Council intends to protect these lanes and byways by preserving, as far as possible, the trees and hedgerows, banks, ditches and verges which contribute to their character, and by resisting development proposals which have an adverse environmental impact upon them (such as a material increase in traffic).

Walking Facilities

6.9.12 No footways are provided alongside Waltham Road, Boreham Road or Cranham Road in the immediate vicinity of the Order limits. A National Walking Trail (Essex Way) runs to the north of the Order limits, which ultimately runs from Epping in the south to Harwich in the north. Within the vicinity of the Order limits, the trail runs north along the River Ter, eastwards along the southern boundary of Sandy Woods before reaching Terling and then heading northwards. There are a number of Public Rights of Way which pass through the Order limits or run adjacent to the Order limits which are summarised within **Appendix 13A: Transport Assessment** of the ES [EN010118/APP/6.2].

Cycling Facilities

6.9.13 National Cycle Network (NCN) Route 50 passes within 5km of the Order limits, running along Terling Hall Road to the east of the Order limits, before running through Terling and joining Braintree Road to run towards Great Leighs to the northwest. There are no on or off-road cycling facilities on Waltham Road, Boreham Road, or Cranham Road to the west of the Order limits.

6.9.14 Within a 2.5km distance, the Order limits can be accessed from Boreham to the south and Gamble's Green to the northeast. Within a 5km distance, the Order limits can also be accessed from Great Leighs to the north, Terling to the northeast, Hatfield Peverel to the southeast, parts of Springfield and Chelmer Village (within northeast Chelmsford) to the southwest and Little Waltham to the west.

Equestrian Facilities

6.9.15 An existing bridleway (PRoW 213_48) runs along the existing private road to/ from Bulls Lodge Substation for a distance of circa. 550m. In addition, an existing bridleway (PRoW 213_23) crosses the existing private road to/ from Bulls Lodge Substation approximately 200m to the northeast of the junction with the RDR. The locations of these PRoW are shown within **Figure 13-2** of the ES [EN010118/APP/6.3].

Public Transport Facilities

6.9.16 The nearest bus stops are located on the B1137 Main Road in the village of Boreham to the south of the Order limits, which are served by bus routes 71 and 73.

6.9.17 There are no bus stops located on Waltham Road or Boreham Road to the west of the Order limits.

6.9.18 The nearest rail station to the Order limits is Hatfield Peverel station which is located approximately 4km to the north-east of Boreham and is served by the Great Eastern Main Line which runs east-west to the south of the Order limits. Chelmsford Station is located approximately 7km to the southwest of the Order limits which is also served by the GEML. These stations provide connections to Ipswich and Colchester (including Colchester Town) and

Braintree to the north, as well as Chelmsford, Shenfield, Stratford and London Liverpool Street to the south.

Assessment of Effects

6.9.19 The embedded design mitigation measures referred to below will be implemented during the construction and decommissioning phases. These measures will be secured through the DCO, primarily by the Framework Construction Traffic Management Plan (CTMP) and Outline Public Rights of Way Management Plan (**Appendix 13B** of the ES [EN010118/APP/6.2]), as well as via the **OCEMP** [EN010118/APP/7.10] or the Decommissioning Strategy [EN010118/APP/7.12] for the decommissioning phase. These measures include:

- a. Delivering a north-south construction route through the Order limits, to allow vehicles to access all areas via a single point of access during the construction period;
- b. Maintaining access to PRoW during the construction phase, including minimum legal widths for PRoW users;
- c. Providing temporary diversion routes where necessary i.e., when the Grid Connection Route is installed, to avoid any PRoW closures;
- d. Providing sufficient protection / separation between existing PRoW and the construction route where necessary;
- e. Managing areas where the internal construction route crosses any existing PRoW (where these are unable to be diverted) or local access roads, by maximising visibility between construction vehicles and other users (pedestrians and road users), implementing traffic management e.g., advanced signage to advise other users of the works, as well as manned controls at each crossing point (marshals / banksmen), with a default priority that construction traffic will give-way to other users. This includes several PRoW crossing points (see **Figure 13-4** of the ES [EN010118/APP/6.3]) as well as two crossing points on Noakes Lane and the short section of PRoW 213_48 which runs along the private road to/ from Bulls Lodge Substation (see **Appendix 13B: Framework CTMP** of the ES [EN010118/APP/6.2]);
- f. Restricting HGV movements to certain routes i.e., via the A130, Wheelers Hill and Cranham Road to the west, to prevent construction vehicles from using the B1137 Main Road and passing through Hatfield Peverel and / or Boreham;
- g. Reducing HGV movements during certain times of the day (e.g., between 07:00 and 09:00, as well as 17:00 and 19:00), to avoid increasing traffic levels on the surrounding highway network during the traditional weekday peak hours;
- h. Implementing a Delivery Management System to control the bookings of HGV deliveries from the start of the construction period. This will be used to regulate the arrival times of HGVs via timed delivery slots, as well as to monitor compliance of HGV routing (instructing all HGV drivers to avoid Waltham Road to the south of the proposed access and Boreham Road to the north of Cranham Road). In addition, adequate space will be made available along the proposed site access

- road to ensure no queuing back onto the surrounding road network occurs;
- i. Implementing a monitoring system to record the route of all HGVs travelling to and from the Order limits, to record any non-compliance with the agreed routing strategy and to communicate any issues to the relevant suppliers to ensure the correct routes are followed. At this stage, it is envisaged that this would be based on vehicles turning at the site access on Waltham Road where any instances of non-compliance would be recorded by on-site security staff i.e., for any HGVs turning right in or left out (travelling to/ from the south);
 - j. Developing a communications strategy including regular meetings with contractors to review and address any issues associated with travel to / from the Order limits, as well as to relay information including any restrictions and requirements which should be followed;
 - k. Providing a suitable point of access on Waltham Road circa. 125m to the south of the junction with Cranham Road, with any supporting improvements (e.g., vegetation clearance) to take place within the highway boundary and the Order limits if required;
 - l. Implementing Temporary Traffic Management (TTM) on Waltham Road during the period when the Grid Connection Cables are installed to connect the Bulls Lodge Substation with the Solar Farm Site. It is envisaged that the TTM will be secured as part of the detailed CTMPs as these are prepared;
 - m. As set out within the Framework CTMP (see **Appendix 13B** of the ES [EN010118/APP/6.2]), the following arrangements are proposed to be implemented to safely manage the construction vehicle crossing point on Waltham Road, of which there are expected to be up to 30 vehicle crossing movements per day for a period of approximately 30 weeks during the construction phase:
 - i. The construction access points will be located opposite each other on Waltham Road (both gated out-of-hours to prevent general access);
 - ii. All construction vehicles will access the western section via the eastern section, which will in turn be accessed from within the Solar Farm Site i.e. the crossing will accommodate straight-ahead vehicle movements only, with no vehicles turning to/ from Waltham Road;
 - iii. The construction access tracks will have a minimum width of 6m to accommodate two-way HGV movements movement along the construction access route;
 - iv. Forward visibility splays of at least 125m will be provided to the vehicle crossing point and associated Temporary Traffic Management (TTM) for traffic approaching the crossing point on the two Waltham Road approaches;
 - v. Temporary traffic signals will be implemented at each arm of the crossing (this includes one on each side of the crossing on Waltham Road and one on each side of the crossing on the construction route i.e., four traffic signals in total); and

- vi. The temporary traffic signals will be demand-based (i.e., on-call system for the two minor construction access arms, to ensure Waltham Road traffic is only impacted when construction vehicles need to cross Waltham Road).
- n. Encouraging local construction staff to car share to reduce single occupancy car trips, by promoting the benefits of car sharing such as reduced fuel costs and by providing dedicated parking spaces for those car sharing;
- o. Implementing a shuttlebus service to transfer non-local staff to / from local worker accommodation (assumed average occupancy of 25 workers per service), to reduce vehicle trips on the surrounding highway network. Whilst these locations are currently unknown, these are likely to be locally based in Chelmsford and Braintree (see **Appendix 13B** of the ES);
- p. Providing limited (but sufficient) on-site car parking to accommodate the expected parking demand of construction staff within the Order limits;
- q. Implement local off-site highway improvements (verge clearance, hedge cutting and / or carriageway widening), where required along Wheelers Hill, Cranham Road and Waltham Road, to support HGV movements;
- r. Positioning of suitably qualified banksmen at the proposed site access on Waltham Road for the Solar Farm Site, the two proposed accesses for Bulls Lodge Substation, the Waltham Road construction vehicle crossing point and at internal crossing points, to allow all vehicle arrivals and departures to be safely controlled during the construction period;
- s. Vegetation clearance at proposed site access on Waltham Road (visibility splays of 125m), the two crossing points on Noakes Lane (visibility splays of 90m) and the proposed Bulls Lodge Substation accesses from the private road (visibility splays of 90m) in order to achieve appropriate levels of visibility at these locations as agreed with ECC Highways. Drawings showing the proposed access and crossing points, visibility splays and swept paths are held within **Appendix 13A: Transport Assessment** of the ES [EN010118/APP/6.2];
- t. Avoiding the usage of Protected Lanes, unless required for emergency access;
- u. Providing sufficient cycle parking spaces within the Order limits to encourage construction staff to travel by bicycle where viable (50 cycle parking spaces to be provided);
- v. Should it be necessary, access for emergency vehicles will also be achievable via several alternative existing access points (e.g., should the proposed access for the Solar Farm Site become blocked or unavailable).
- w. In terms of construction compounds, the main construction compound for the Solar Farm Site will served by the proposed site access on Waltham Road and approximately ten smaller secondary compounds will be situated across the Solar Farm Site at strategic locations, served by the primary and secondary access routes. A construction compound

will also be provided for Bulls Lodge Substation which will be accessed via the proposed eastern access on the private road. Further details are held within **Appendix 13B: Framework CTMP** of the ES [EN010118/APP/6.2].

- x. A specialised haulage service will be employed to allow abnormal loads to transport components with the necessary escort, permits and traffic management, with the contractor consulting the relevant highways authorities to ensure the correct permits are obtained. The police will also be given advanced notification under the Road Vehicle Authorisation of Special Types Order 2003.

6.9.20 The embedded design mitigation measures referred to below will be implemented during the operational phase and will be secured through the DCO such as through the Outline Operational Environmental Management Plan [EN010118/APP/7.11]:

- a. Converting the north-south construction route to a green corridor and maintenance route, to improve connectivity for pedestrians and cyclists through the Solar Farm Site, as well as to allow operational vehicles to access all areas of the Solar Farm Site via a single point of access during the operational period;
- b. Maintaining access to all existing PRow within the Order limits, with no diversions or closures (any PRow temporarily diverted during the construction phase will be reinstated during the operational phase);
- c. Providing additional permissive paths within the Solar Farm Site to improve connections and desire lines for pedestrians and cyclists, including to / from existing PRow, National Cycle Route 50, Essex Way and the Chelmsford Garden Community;
- d. Providing a suitable point of access for operational vehicles on Waltham Road circa. 125m to the south of the junction with Cranham Road;
- e. Controlling areas where the internal maintenance route crosses any existing PRow or local access roads (such as by providing gates), permitting only operational traffic to utilise these internal routes within the Order limits. Operational traffic should give-way to other users (pedestrians and road users) when utilising the crossing points. Visibility will be maximised between operational vehicles and other users, with warning signage provided if required; and
- f. Measures such as planting of hedgerows, maintained to a height of at least 3m, in order to conceal the solar reflections and to mitigate the overall impacts for road receptors (based on the Glint and Glare Assessment see (**Appendix 10G** of the ES [EN010118/APP/6.2])).

6.9.21 The assessment shows that with the exception of Waltham Road, the construction phase is not expected to result in any significant impacts with respect to severance, pedestrian delay and accidents and safety, with temporary **negligible** effects (**not significant**). It is anticipated that before the implementation of additional mitigation/enhancement measures, Waltham

Road (north of Main Road) will experience a **moderate adverse** effect, which is considered **significant**.

- 6.9.22 The assessment shows that the construction phase is not expected to result in any significant impacts with respect to pedestrian and cyclist amenity and fear and intimidation, with temporary **negligible** effects anticipated for all receptors. This is **not significant**.
- 6.9.23 During the operational phase, the Scheme is expected to attract a low level of trips, i.e., up to 8 arrivals and 8 departures daily (see **Appendix 13A: Transport Assessment** of the ES and a detailed assessment of this scenario has therefore been excluded from this ES, as agreed in the Scoping Opinion. It is considered that the overall glint and glare impacts of the proposals will be **negligible** for the surrounding highway network with the proposed mitigation in place. This is considered as **not significant**.
- 6.9.24 For the purposes of the EIA, the decommissioning assessment year is assumed to be not earlier than 2066. The decommissioning period is expected to be similar in duration and nature to the construction phase, albeit slightly shorter in duration and with fewer vehicle trips. It is therefore considered reasonable to assume that the traffic flows will be the same as, and not greater than, the construction phase. This may overestimate the actual traffic flows slightly but is considered to be broadly accurate. In addition, this scenario is considered to be too far into the future to be able to accurately predict future baseline traffic flows or road / junction layouts at that time.
- 6.9.1 It should be noted that the above approach is consistent with **Appendix 13A: Transport Assessment** of the ES [EN010118/APP/6.2] as well as the PEI Report which was submitted in May 2021.

Mitigation Measures

- 6.9.2 The following additional mitigation and enhancement measures are proposed for the construction and decommissioning phases to mitigate against the significant adverse effect identified for driver delay on Waltham Road:
- a. Utilise the Chelmer Valley Park and Ride (P&R) site for construction worker parking during the peak construction (and decommissioning) periods of the Scheme, to reduce construction vehicle worker trips on the surrounding network including at the B1137 Main Road/ Waltham Road junction.
- 6.9.3 In view of the above, the forecast magnitude of effect for Driver Delay has been reduced from 'Medium' to 'Very Low' for Waltham Road (north of Main Road) with this additional mitigation in place. The forecast magnitudes of effect remain unchanged for the remainder of the highway network and assessment criteria.
- 6.9.4 The following additional mitigation and enhancement measures are proposed for the construction and decommissioning phases to provide added benefits rather than to resolve any adverse impacts:

- a. Cut back vegetation at the Waltham Road / Cranham Road junction (within the highway boundary) to maximise visibility at this junction; and
 - b. Conduct a Stage 1 Road Safety Audit on the preliminary design of access and crossing points and proposed carriageway widening post-submission.
- 6.9.5 No additional mitigation and enhancement measures are proposed for the operation phase, above the embedded measures set out above, given that there are not expected to be any significant effects as a result of the Scheme.
- 6.9.6 The following monitoring will be carried out during the construction and decommissioning phases of the Scheme, and secured as part of the Framework CTMP [EN010118/APP/6.2], OCEMP [EN010118/APP/7.10] or detailed CTMPs when these are prepared in due course:
- a. The collision record of Waltham Road will be monitored within the vicinity of the Solar Farm Site access including a 250m stretch to the southeast of the access and the 125m section to the northwest of the access up to the junction with Cranham Road;
 - b. Construction vehicles (HGVs) will be monitored to ensure HGV drivers are adhering to the agreed routing strategy (see **Figure 13-3 of the ES [EN010118/APP/6.3]**), with all HGVs to turn left in and right out of the Solar Farm Site access on Waltham Road;
 - c. Road safety will be monitored within the Order limits including at the PRoW crossing points, temporary PRoW diversion points, and at the Noakes Lane crossing points; and
 - d. The TTM on Waltham Road will be monitored when this is required for the installation of the Grid Connection Route.

6.10 Air Quality

Baseline and Context

- 6.10.1 **Chapter 14: Air Quality** of the ES [EN010118/APP/6.1] presents the findings of an assessment of the likely significant effects on Air Quality as a result of the Scheme. The assessment relates to dust generation and emissions from additional road traffic and onsite equipment during the construction phase. The impacts of the operational phase have been scoped out of the air quality assessment. The decommissioning phase will be similar in nature, duration and extent to the construction phase, albeit likely to be shorter in duration, with less earth moving onsite and fewer road traffic movements and onsite equipment.
- 6.10.2 The air quality in the study area is generally good. There are no AQMAs within 5km of the Order limits, and neither Braintree District Council nor Chelmsford City Council undertake extensive air quality monitoring around the Order limits as there are no concerns about air quality.

Assessment of Effects

Construction

- 6.10.3 The Dust Risk Assessment has identified the Order limits as ‘High-Risk’ and therefore mitigation measures for a high-risk site have been proposed. The adequate implementation of good industry practice measures is expected to prevent the occurrence of significant impacts arising from dust generation during the construction phase. Residual effects are therefore expected to be **negligible and not significant**.

Operation

- 6.10.4 The impacts of the operational phase have been scoped out of the air quality assessment. The Scheme is expected to support up to eight permanent (on-site) operational jobs. Traffic generation from operational staff is not expected to induce significant changes to traffic flows on the local road network. The operation of the Scheme is therefore not anticipated to have a significant impact on local air quality. The effect on air quality during this phase will therefore be **negligible and not significant**.

Decommissioning

- 6.10.5 Decommissioning is expected to generate similar (if not slightly lower) effects to those anticipated during construction and therefore the mitigation measures proposed for implementation during the construction phase will be appropriate for application to decommissioning. A Decommissioning Strategy [EN010118/APP/7.12] has been prepared for the Scheme.
- 6.10.6 Removal of equipment and reinstatement of ground is anticipated to span a duration of 12-14 months. Impacts on local air quality as a result of dust generation are expected to be confined to this timeframe and therefore be short-term and temporary. Effects are considered to be **negligible and not significant**.

Mitigation Measures

- 6.10.7 Embedded mitigation measures appropriate for the risk of dust nuisance will be implemented through the CEMP in accordance with the Institute of Air Quality Management’s (IAQM’s) guidance. Measures to minimise the risk of dust during construction are listed within **Appendix 2A: OCEMP** of the ES [EN010118/APP/7.10].
- 6.10.8 Dust monitoring will be carried out during construction and decommissioning activities, to confirm that dust levels are as anticipated in this assessment and not significant.

6.11 Human Health

Baseline and Context

- 6.11.1 **Chapter 15: Human Health** of the ES [EN010118/APP/6.1] assesses the potential effects of the construction, operational and decommissioning stages

of the Scheme on human health, taking into account the results from the other technical chapters within the Environmental Statement.

- 6.11.2 Based on the 2011 Census data, the study area has a slightly better health status than the wider region and other nearby counties. The proportion of physically active people is slightly lower than in the surrounding areas.

Assessment of Effects

- 6.11.3 The assessment has considered access to healthcare services and other social infrastructure; air quality, noise and neighbourhood amenity; accessibility and active travel; access to work and training; and social cohesion and lifetime neighbourhoods
- 6.11.4 It is unlikely that there will be any severance between local residents and the healthcare facilities or other social infrastructure which they use during the construction, operation, or decommissioning phase of the Scheme. This is because neither the additional construction/decommissioning traffic or the traffic generated during the operational phase will result in the transport network becoming over capacity. Any road closures required will not prevent access and no severance is expected.
- 6.11.5 The assessment does not identify any negative impacts on the amenity of residents. Air particulate concentrations will remain low on account of the low background levels, and noise levels from all phases of the Scheme are not assessed to pose any impacts to health.
- 6.11.6 During the construction phase, the Scheme will result in temporary impacts on a number of Non-Motorised User (NMU) facilities in the study area. The Scheme will provide diversions for each of these routes, however the negligible length of the diversions in place would have only a **minor effect** on journey times and is unlikely to discourage users from traveling along these routes. The construction phase is assessed to have a **negative health impact**.
- 6.11.7 During the operational phase, the Scheme will provide additional NMU facilities which may improve journey times for some NMUs. The Scheme is therefore expected to lead to a **positive health impact** during the operational phase.
- 6.11.8 The decommissioning phase would be expected to have a similar impact on NMU facilities in the study area, with temporary closures of PRoWs, as well as potentially removing the permissive paths following the operation phase. The Scheme is therefore expected to lead to a **negative health impact** during the decommissioning phase.
- 6.11.9 The construction phase of the Scheme will support 563 total net jobs per annum, with 254 jobs per annum being taken up by residents within 60 minutes of the Order limits. The decommissioning phase expected to support the same number of jobs, and local jobs, as the construction phase. During these periods the Scheme is therefore expected to lead to a positive health impact on access to work and training. During the operation phase, the

scheme is assessed to have a **neutral impact** on access to work as there will be a net zero provision of jobs as a result of the scheme.

6.11.10 During the construction phase, the Scheme will result in temporary impacts on a number of NMU facilities in the study area. The Scheme will provide diversions for each of these routes, however the negligible length of the diversions in place would have only a minor effect on journey times between communities and is unlikely to discourage users from traveling along these routes. The construction phase is assessed to have a **negative health impact**.

6.11.11 During the operational phase, the Scheme will provide additional NMU facilities which may improve journey times between communities for some NMUs. The Scheme is therefore expected to lead to a **positive health impact** during the operational phase.

6.11.12 The decommissioning phase would be expected to have a similar impact on NMU facilities in the study area, with temporary closures of PRoWs, as well as potentially removing the permissive paths following the operation phase. The Scheme is therefore expected to lead to a **negative health impact** during the decommissioning phase.

Mitigation Measures

6.11.13 Primary mitigation measures are embedded within the Scheme, as set out in the respective chapters in the Environmental Statement, to reduce other operational effects (such as noise, air quality and landscape) which in turn will mitigate the effects on the local community and existing facilities from a human health perspective.

6.11.14 The Scheme design has embedded sufficient mitigation to avoid significant adverse effects on human health and wellbeing, without additional mitigation measures being required.

6.12 Other Issues

6.12.1 **Chapter 16: Other Issues** of the ES [EN010118/APP/6.1] assesses the following topics: glint and glare; ground conditions; major accidents and disasters; telecommunications, television reception and utilities; and waste. None of these warrant individual chapters in the ES, either due to the brevity of the assessment or the small impact associated with the Scheme.

Glint and Glare

6.12.2 'Glint' refers to a momentary flash of bright light typically received by moving receptors or from moving reflectors. 'Glare' refers to a continuous source of bright light typically received by static receptors or from large reflective surfaces.

6.12.3 The full study on glint and glare, undertaken for the Scheme by Neo Environmental is available in **Appendix 10F** of the ES. A number of potential receptors to glint and glare are present in the vicinity of the Order limits. These include aircraft, trains, road vehicles and residents.

- 6.12.4 Mitigation measures implemented to reduce impacts include hedgerows to be grown, infilled, gapped up and maintained to a height of at least 3m. It is assumed that planting will grow at 33cm per year (as set out in **Chapter 10 Landscape and Visual Assessment** (Section 10.3) of the ES [EN010118/APP/6.1]) and therefore until those hedgerows are grown sufficiently, a temporary 3m temporary wooden solid hoarding will be implemented where required and then removed once the hedgerows are of a sufficient height. Further information is presented in **Appendix 10G: Glint and Glare Assessment** of the ES [EN010118/APP/6.2]. These measures will be secured through the **OLEMP** [EN010118/APP/7.13].
- 6.12.5 Solar reflections are possible at 93 of the 99 residential receptors assessed within the 1km study area. Once mitigation was implemented with the Scheme design, impacts remained low for 7 receptors and reduced to none for all remaining receptors. Therefore, overall impacts on residential receptors are **acceptable** and **not significant**.
- 6.12.6 Solar reflections are possible at 53 of the 56 road receptors assessed within the 1km study area. Once mitigation was implemented, overall impacts at all road receptors reduce to **none** and are therefore **not significant**.
- 6.12.7 Solar reflections are possible at 2 of the 3 rail receptors assessed within the 1km study area. Upon reviewing the actual visibility of the receptors, glint and glare impacts reduce to none for all receptors. Therefore, overall impacts for rail receptors are **none** and are therefore **not significant**.
- 6.12.8 Four runways and two Air Traffic Control Towers were assessed at Earls Colne Airfield and Andrewsfield Airfield and the impacts were found to be **none** and **not significant** as there is no glare anticipated at the runways or Air Traffic Control Towers.

Ground Conditions

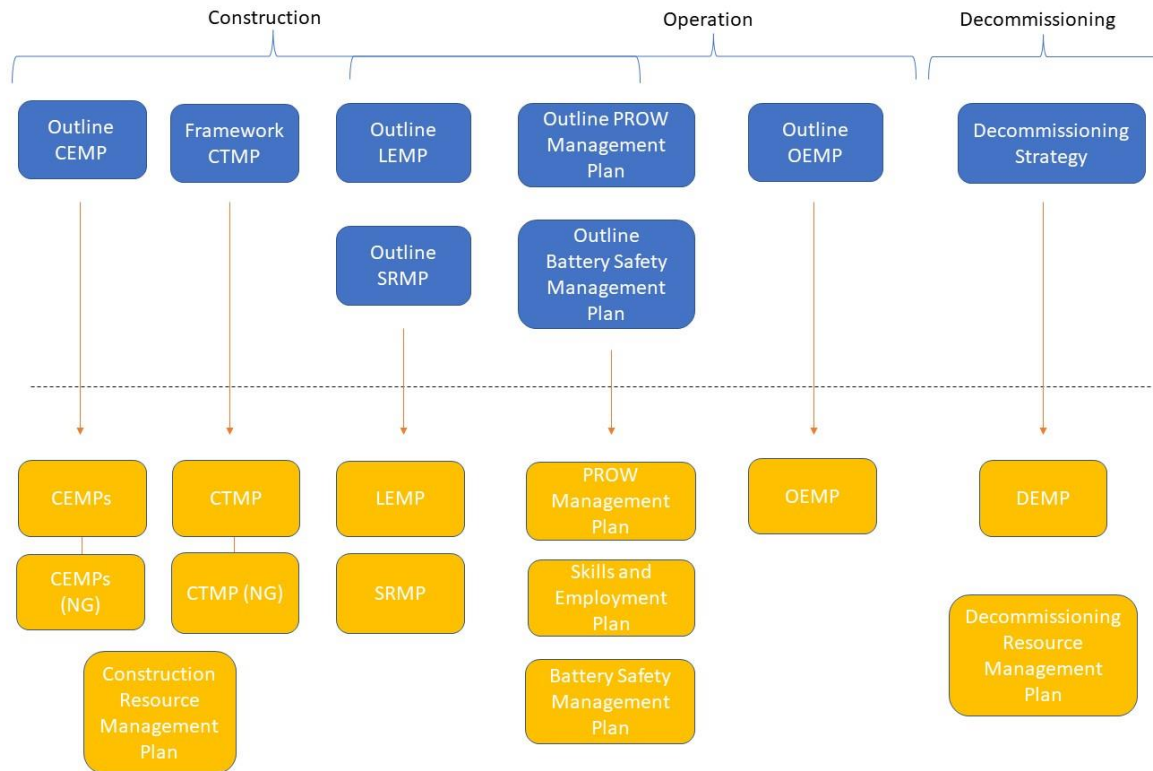
- 6.12.9 The land condition within the Order limits has been assessed to identify potential environmental land quality liabilities and constraints prior to the Scheme. A Preliminary Risk Assessment has been prepared to determine whether potentially contaminative uses have taken place within, or in close proximity to, the Order limits, which could have led to the contamination of underlying soils or groundwater.
- 6.12.10 The potential risks that have been identified have been assessed by the Preliminary Risk Assessment as being very low to low.
- 6.12.11 A number of environmental design and management measures will be employed as standard industry good practice to minimise impacts to both human health and controlled waters during the construction and decommissioning phases of the Scheme. These measures have been incorporated into the **OCEMP** [EN010118/APP/7.10].
- 6.12.12 Potential impacts from the decommissioning of the Scheme are similar in nature to those during construction, as some groundwork would be required to remove infrastructure installed. A Decommissioning Strategy

[EN010118/APP/7.12] has been prepared to identify required measures to prevent pollution during this phase of the development.

- 6.12.13 The information collected as part of the assessment suggests that there are no significant constraints with regards to contamination of soil and groundwater that would limit the development of the Order limits.
- 6.12.14 Given the risks of contaminated land are deemed very low to low, and the well-established good industry practices in construction for managing contaminated land which will be incorporated into the CEMP and Decommissioning Environmental Management Plan (DEMP). It is considered that the potential effects of contamination or risk of contamination is **negligible and not significant**.
- 6.12.15 Mitigation measures and standard best practice will be followed during construction, operation and decommissioning of the Scheme. The measures outlined in the detailed CEMP and DEMP will be followed throughout construction and decommissioning, respectively.

Major Accidents or Disasters

- 6.12.16 This section summaries a description of the expected significant adverse effects of the development on the environment deriving from the vulnerability of the development to risks of major accidents and/or disasters which are relevant to the project.
- 6.12.17 'Accidents' are an occurrence resulting from uncontrolled developments in the course of construction, operation and decommissioning (e.g., major emission, fire or explosion). 'Disasters' are naturally occurring extreme weather events or ground related hazard events (e.g., subsidence, landslide, earthquake).
- 6.12.18 An exercise was undertaken to identify all possible major accidents or disasters that could be relevant to the Scheme. Major accidents or disasters with little relevance in the UK were not included, such as volcanic eruptions for example.
- 6.12.19 Embedded mitigation measures appropriate for the risk of the major accident or disaster have been incorporated into the Scheme design and implemented through the CEMP. A Battery Safety Management Plan (BSMP) has been produced for the Scheme **[EN010118/APP/7.6]**. This will be updated and maintained as a 'live document' throughout the operational phase of the Scheme. The implementation of the strategy will be secured via a requirement to the DCO.
- 6.12.20 Minimising the risk of major accidents during construction, operation, and decommissioning will be addressed through appropriate risk assessments as required in a series of Management Plans, as illustrated on **Plate 3** below:



Note, CEMPs will include detailed issue-specific plans such as dust management plans, water management plans, biosecurity management plans etc.

Plate 3: Management Plans²

6.12.21 Given the nature of accidents and disasters, there is the potential for significant effects if an event does occur, however, the assessment has concluded that the risk of such events occurring is low for the Scheme, and significant effects on the environment are therefore not anticipated.

6.12.22 A BESS Plume Assessment has been produced by the Applicant and is presented in **Appendix 16B** of the ES [EN010118/APP/6.2]. This document provides an assessment of the potential worst case credible air quality impacts of a fire incident at the BESS. The design of the BESS may change at detailed design stage, when a decision is made to select a supplier, product, and battery chemistry. Any selection made will be compliant with the Rochdale envelope principles listed within Work No.2 of the Outline Design Principles. The Applicant will update the Battery Safety Management Plan and BESS Plume Assessment at detailed design stage to reflect the chosen technology, which would be shared with the council(s) and the local fire service for approval prior to construction of the BESS. Technology will only be selected if it shows to produce a plume which is the same or less harmful than the LFP (Lithium Iron Phosphate) technology which has been selected as the concept

² Soils Resource Management Plan (SRMP)

design and modelled at time of DCO submission. There are several safety measures to prevent a fire if a defect occurs, but the assessment has assumed none of these are successful and is therefore to overestimate the impact associated with a fire.

- 6.12.23 A number of credible worst-case scenarios have been developed and modelled for the Concept Design battery system. These scenarios are typically the release of toxic gas(es), a fire event, and or an explosion from the ignition of gasses, or a combination thereof. For these to occur, a number of failures of protection systems would have to occur before and during the event. i.e., cell and module monitoring systems, system monitoring and gas detection systems.
- 6.12.24 The findings of the study have shown that the worst-case impact of a toxic release varies dependent upon the prevailing wind direction and speed. The only toxic gas with the potential to extend beyond the site boundary is hydrogen fluoride (HF). The concentration of HF is predicted not to exceed the safe limits at any properties under worst case conditions (three times lower than the safe level). Therefore, the likely impact on the general public, particular nearby residents is deemed to be very low.
- 6.12.25 Smoke may also accompany the toxic gas release, and an Emergency Response Plan will be prepared post consent to ensure protocols are in place for notifying local residents should they be advised to stay indoors, keep windows shut, or not exercise outdoors (as secured by the OEMP). It is anticipated that the emergency response would take no more than a few tens of minutes, however the precise procedure and response time will be finalised post consent.
- 6.12.26 In the more unlikely scenario that there is an unconfined explosion, following several successive technology failures, the worst case modelling scenario shows the explosion would be limited to slightly under 20m from the affected cell. There are no PRoW, public access, or properties within this distance.
- 6.12.27 In addition to the above, a Fire Service Site Specific Risk Assessment has been produced for the BESS area. The implementation of this is secured via a requirement to the DCO.
- 6.12.28 With the above embedded mitigation, the risk of fire or explosion is minimised and would be very low. In the event it did occur, the concentration of pollutants is predicted not to exceed the safe limits at any properties under worst case conditions. Therefore, the likely impact on the general public, particular nearby residents is deemed to be very low and **no significant** effect on the environment and people from a major accident is anticipated.

Telecommunications, Television Reception and Utilities

- 6.12.29 The Scheme is unlikely to interfere with telecommunications infrastructure and digital television signals, and therefore no effects are anticipated in the construction, operational and decommissioning phases. In any event, the DCO will include the standard protective provisions for the protection of

telecommunications operators, so measures will be in place for the protection of telecommunications infrastructure.

6.12.30 The potential exists for utilities to be affected during the construction of the Scheme through damage caused as a result of excavation and engineering operations. Without any precautionary measures to avoid damage to utilities, this could lead to a short-term adverse effect.

6.12.31 Precautionary measures and embedded mitigation would reduce the likelihood of effects on utilities during construction, as will protective provisions in the DCO. Therefore, no adverse effects are expected during construction. No effects on utilities are predicted as a result of the operational phase of the Scheme because no below-ground works will be required during operation. No adverse effects on utilities are also predicted during decommissioning.

Waste

6.12.32 A description of the potential streams of construction waste and estimated volumes are included within **Chapter 6: Climate Change** of the ES [EN010118/APP/6.1]. In addition to this, the CEMP, which would be produced following receipt of a DCO, will set out how waste will be managed on-site, and opportunities to recycle waste will be explored.

6.12.33 Given the nature of the Scheme, significant quantities of waste are not anticipated. Following the implementation of appropriate control measures, **no significant** effects are anticipated during the construction phase.

6.12.34 During the operational phase of the Scheme, waste arisings are expected to be minimal and are not anticipated to result in a significant impact if disposed of appropriately.

6.12.35 It is not possible to forecast the capacity of the landfill sites for decommissioning at this stage due to potential change in waste generation and operators at that time. Waste during the decommissioning phase will be dealt with as part of the Decommissioning Strategy [EN010118/APP/7.12] and in line with relevant legislation and guidance at that time. Therefore, the effect is anticipated to be **not significant**.

6.13 Effect Interactions and Cumulative Schemes

6.13.1 The potential for effect interactions and cumulative effects as a result of the Scheme are presented in **Chapter 17: Effect Interactions** of the ES [EN010118/APP/6.1].

6.13.2 Effect interactions may arise where several different effects resulting from the Scheme have the potential to affect a single receptor (e.g., decrease in air quality, alongside an increase in noise disturbance). The assessment draws on the assessment of impacts provided in **Chapters 6 to 16** of the ES [EN010118/APP/6.1].

6.13.3 No effect interactions are anticipated as a result of the construction, operation, or decommissioning of the Scheme.

- 6.13.1 Cumulative effects are where there is the potential for two or more developments that are reasonably foreseeable and/or consented, but not yet constructed or operational, within close enough proximity to the Scheme to lead to effects on the same receptor. Technical **Chapters 6 to 16** of this ES present high-level conclusions of potential cumulative effects. A detailed description of the assessment methodology for cumulative effects can be found in **Chapter 5: EIA Methodology** of the ES [EN010118/APP/6.1]. Significant cumulative effects are summarised below:
- 6.13.2 The construction activity from the Scheme and cumulative schemes would introduce additional activity and construction features into LCA B17. This would further reduce the level of tranquillity and alter the condition of the landscape local to the sites. The extent of the change relative to the scale of the LCA would be increased, compared to the Scheme alone. Change would be focussed in the western half of the LCA. The cumulative schemes would result in permanent change, introducing new built features within the LCA. This would introduce change to the western part of the LCA; resulting in the partial alteration of the extent of arable farmland, settlement pattern and network of winding lanes, which are recorded as being key characteristics. The magnitude of effect would increase from minor adverse to moderate adverse for both construction and operation (year 1), due to the increased extent of LCA B17 changed by the cumulative schemes and the cumulative effect on key characteristics. Therefore, the cumulative effect is considered to be **significant**.
- 6.13.3 The cumulative schemes would include substantial construction of new housing and infrastructure. This would increase the level of construction activity and would alter the condition of the landscape, likely resulting in the loss of vegetation cover. The magnitude of effect would increase from minor adverse to moderate adverse for construction, considering the scale of construction relative to the overall LCA, the cumulative effect is therefore considered to be **significant**.
- 6.13.4 Construction of the cumulative schemes in combination with the Scheme would introduce additional activity and construction features into LLCA 02. This would further reduce the level of tranquillity and alter the condition of the landscape local to the sites. The extent of the change relative to the scale of the LLCA would be increased, compared to the Scheme alone, resulting particularly from Chelmsford North East Bypass which would occupy a similar length to the Scheme within the LLCA. The magnitude of effect would increase to high. There would be an increase in the presence of built structures within LLCA 02. Those associated with the cumulative schemes would be permanent. There would be a partial alteration to the level of tranquillity and the extent of arable land, noted as key characteristics. The cumulative change would remain a partial alteration to the LLCA and therefore the magnitude of effect would remain as medium. The magnitude of effect would increase from moderate adverse to major adverse for construction and remain moderate adverse for operation (year 1), considered to be **significant**.

- 6.13.5 Glimpses of construction activity and features related to the A12 Chelmsford to A120 Widening Scheme may be visible in the background of the view in combination with the installation of the cable route and Bulls Lodge Substation Extension. Although intervening landform and vegetation lining the northern side of the railway would substantially screen such features. Overall, the extent of the view with potential to be changed by construction would be increased and therefore the magnitude of effect would increase to medium. The magnitude of effect for construction will increase from minor adverse to moderate adverse, and the cumulative effect is therefore considered to be **significant**.
- 6.13.6 The combined effect of the construction of the cumulative developments is likely to bring considerable additional employment to the local economy. The overall cumulative effect from the generation of construction workers is likely to remain as temporary moderate beneficial effect on the economy of the study area, which is considered **significant**.
- 6.13.7 The construction phases of the Scheme and other cumulative developments would both be expected to generate employment. It is expected that there would be a beneficial effect on construction related employment within the local area, which would have a beneficial effect on human health and wellbeing. Once the committed developments are built there will be new commercial, retail and leisure space created that will provide further opportunities for residents to access work and training in the local area. The new employment space would provide job opportunities for existing and new residents to the area, resulting in a cumulative beneficial effect for the local community. It is expected that there would be a cumulative beneficial effect on construction related employment within the local area. The magnitude of this effect is difficult to quantify in the absence of information relating to construction costs of the cumulative developments. It is expected that there would be a cumulative beneficial effect on operation related employment within the local area. This would result in a potentially **significant** effect.

7. Summary and Conclusions

- 7.1.1 The ES explains the findings of the EIA process that has been undertaken for the Scheme.
- 7.1.2 A number of environmental impact avoidance, design and mitigation measures have been identified to mitigate and control environmental effects during construction, operation (including maintenance) and decommissioning of the Scheme. It is proposed that these will be secured through appropriate requirements and other controls within the DCO for the Scheme, should this be granted.
- 7.1.3 Feedback from the formal consultation process has been taken into account when preparing the Application and in undertaking the EIA process.

8. References

- Ref 1-1 The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017).