FENWICK SOLAR FARM

Fenwick Solar Farm
EN010152

Environmental Statement

Volume IV: Non-Technical Summary

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1. Introduction

1.1 Overview

1.1.1 This document has been prepared by AECOM on behalf of Fenwick Solar Project Limited (the Applicant) and provides a Non-Technical Summary (NTS) of the Environmental Statement (ES) for the proposed Fenwick Solar Farm (hereafter referred to as the Scheme).

1.1.2 The Scheme will comprise the construction, operation and maintenance, and decommissioning of a solar photovoltaic (PV) electricity generating facility with a total capacity exceeding 50 megawatts (MW) together with a Battery Energy Storage System (BESS) with a connection to the National Electricity Transmission System (NETS) via National Grid's Existing Thorpe Marsh Substation or via a Grid Connection Line Drop. The Scheme also includes land for ecological mitigation and enhancement.

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

1.1.4 Following an examination by the Planning Inspectorate, this application will be decided by the Secretary of State for Energy Security and Net Zero.

1.1.5 AECOM is a registrant to the Environmental Impact Assessment (EIA) Quality Mark scheme run by the Institute of Environmental Management and Assessment (IEMA).

1.2 What is an Environmental Impact Assessment?

1.2.1 Environmental Impact Assessment (EIA) is a process to ensure that planning decisions are made with full knowledge of the likely significant environmental effects of a proposed development. The outcome of the EIA process is reported within an ES which is submitted with a DCO Application.

1.2.2 The objective of the EIA is to identify any likely significant effects which may arise from a proposed development and to identify measures to prevent, reduce or offset any adverse effects and to enhance any beneficial effects. During the EIA process for the Scheme, opportunities and management measures have been identified and incorporated within the development proposals to prevent or reduce any adverse effects, and to enable sustainable design and construction principles to be embedded within the Scheme.

1.3 The Applicant

1.3.1 The Applicant is a wholly owned subsidiary of BOOM Developments Limited who specialise in non-subsidised solar and battery storage projects. BOOM Developments Limited was founded in 2020, and the name BOOM is an acronym for Build Own Operate Maintain. This reflects the organisation's intentions to be involved in sustainable energy projects from day one right the way through to operation. The BOOM Managing Director and team have been responsible in previous roles for constructing more than 700 MW of solar developments between 2015 and 2017 and developing more than 850 MW of solar projects including the UK's first nationally significant infrastructure solar PV project, Cleve Hill, which was granted a DCO in 2020, and East Yorkshire Solar Farm which is currently undergoing examination, due to close in November 2024. In 2021, the UK based BOOM partnered with the Pelion Green Future group of companies based across Australia, America and the European mainland.

1.4 The Order Limits

1.4.1 The Order limits represent the maximum extent of land to be used for the construction, operation and maintenance, and decommissioning of the Scheme, and over which the Applicant is seeking powers of compulsory acquisition of land, rights and/or temporary use powers. The Site is the collective term for all land within the Order limits. The Order limits comprise approximately 509 ha of land. It is approximately centred on National Grid Reference (NGR) SE 604 161 and located entirely within City of Doncaster Council's administrative area. The surrounding landscape comprises largely agricultural fields and several small rural villages, including Fenwick, Moss, and Sykehouse, as well as the hamlet of Topham.

1.4.2 The Order limits and the Site are shown on **Figure 1** and **Figure 2** of this NTS.

1.4.3 The Site comprises the following elements as shown on **Figure 3** of this NTS:

a. **The Solar PV Site**, which has an approximate area of 407 ha centred on approximate National Grid Reference SE 604 161, will contain ground-mounted Solar PV Panels, Field Stations, Battery Energy Storage System (BESS), On-Site Substation, and associated infrastructure. The Solar PV Site will also include areas of habitat creation/enhancement and landscaping;

b. **The Grid Connection Corridor**, which has an approximate area of 95 ha, centred on the approximate National Grid Reference SE 602 125. This comprises the Grid Connection Cables, linking the On-Site Substation (located within the Solar PV Site) to the Existing National Grid Thorpe Marsh Substation (approximately 6km south of the Solar PV Site); and

c. **The Existing National Grid Thorpe Marsh Substation**, centred on approximate National Grid Reference SE 605 095. This would comprise a substation bay where the Grid Connection Cables would connect to the grid.

1.4.4 The Order limits also include a section of highway at the junction of the A19 and Station Road in the town of Askern to allow for Abnormal Indivisible Load (AIL) vehicle access and escort. This area is approximately 1 ha and is centred on the approximate National Grid Reference SE 56598 13647. At this location, the works are currently anticipated to be limited to temporary traffic signal and banksman control for the period of AIL delivery whilst it is escorted to Solar PV Site, as shown on the **Traffic Regulation Measures Plan [EN010152/APP/2.4]** and specified in the **Draft DCO [EN010152/APP/3.1].** Based upon reasonable worst case preliminary swept path analysis, it is not anticipated that any street furniture is required to be removed to facilitate the manoeuvre.

1.4.5 The Solar PV Site is located entirely within City of Doncaster Council's administrative area. A description of the physical characteristics of the Scheme and the land-use requirements during the construction, operation and maintenance, and decommissioning phases is presented in 4.2 4.

Plate 1: Landscaped Solar PV Facility

1.5 The Purpose of the Environmental Statement and Non-technical Summary

1.5.1 The **ES [EN010152/APP/6.1]** has been produced to accompany the DCO Application, as required by the Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (the EIA Regulation), 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.

1.5.2 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 Overview

2.1.1 **ES Volume I Chapter 5: EIA Methodology [EN010152/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.

2.1.2 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 can make an informed judgement on the environmental impacts of a proposal.

2.1.3 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.

2.1.4 All environmental assessments in the ES follow a similar methodology unless specifically stated within the ES chapter. 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)).

2.1.5 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.

2.1.6 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 “significant” in terms of the EIA Regulations. Where the magnitude of change is identified as “neutral”, there is no effect.

2.1.7 Where significant effects are identified, mitigation is proposed where practicable, to reduce or prevent the likely significant adverse effects occurring. Residual effects are the effects that remain after the proposed mitigation has been considered.

2.1.8 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.

2.1.9 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.

2.2 EIA Scoping

2.2.1 The purpose 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.

2.2.2 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 1 June 2023 (**ES Volume III Appendix 1-1: EIA Scoping Report [EN010152/APP/6.3]**).

2.2.3 The Scoping Opinion was received on 11 July 2023, which presents the formal response from the Planning Inspectorate (on behalf of the Secretary of State) and statutory consultees (**ES Volume III Appendix 1-2: EIA Scoping Opinion [EN010152/APP/6.3]**).

2.2.4 Key issues raised in the Scoping Opinion are summarised in **ES Volume III Appendix 1-3: EIA Scoping Opinion Responses [EN010152/APP/6.3]** and have been considered during the EIA process.

2.3 Preliminary Environmental Information Report

2.3.1 A Preliminary Environmental Information Report (PEIR) was prepared and published in Spring 2024. The purpose of the PEIR 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.

2.3.2 The PEIR provided the preliminary findings of the environmental assessment undertaken at that time in the Scheme design development. Upon completion of the PEIR, the various assessments were at differing stages of completion due to ongoing design work and continued collection of baseline information. The environmental assessments were considered as a worst-case scenario, and therefore the environmental effects identified will either be the same as, or less than, those reported in the ES.

2.3.3 The PEIR has been further developed following completion of the design work and environmental assessment and now constitutes the ES, which this NTS summarises.

2.4 Consultation

2.4.1 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.

2.4.2 The Applicant adopted a two-stage approach to pre-application consultation on the Scheme. A non-statutory consultation was carried out from 27 June 2023 to 24 July 2023, and Statutory Consultation was undertaken between 18 April 2024 and 31 May 2024, which included the publication of the PEIR. Further targeted consultation with a small number of land interests took place across two periods. This is described in the **Consultation Report [EN010152/APP/5.1],** which is submitted as part of the DCO Application.

2.4.3 The publication of the PEIR in Spring 2024 formed an important part of the statutory consultation process, as it allowed consultees the opportunity to provide informed comments on the Scheme, the assessment process, and preliminary findings prior to the finalisation of the DCO Application and the ES. The Applicant sought the views of consultees on the information contained within the PEIR, and there was an opportunity within the process up to submission of the DCO Application for both the EIA and the project design to have regard to comments received.

2.4.4 Following the statutory consultation set out above, the Applicant made several refinements to the boundary of the Scheme (Order limits), having regard to feedback from the consultation, and considering further work on the Scheme's design development and assessment. Most of these refinements reduced the Order limits or reduced impacts that had previously been identified

2.4.5 In one case, the refinements required an increase in the Order limits consulted on at statutory consultation – an extension to the red line boundary that involved moving the Order limits approximately 2 metres further north, requiring a total additional land take of approximately 70m^2. A letter was sent to the landowner on 30 July 2024, outlining how feedback could be provided (via email or freepost) and providing a deadline for response by 30 August 2024 – in excess of the minimum 28 day period required. No response was received regarding this letter.

2.4.6 In addition to this, as a result of ongoing diligent inquiry in the Scheme area the Applicant identified two landowners and an agricultural tenant with interests in the Order limits who had not been consulted at the statutory consultation. The Applicant wrote to the newly identified landowners/occupier on 6 September 2024, with the same information provided to landowners at the launch statutory consultation. The Applicant advised the landowners how they could take part in the consultation and provided a deadline of 8 October 2024 – in excess of the minimum 28 day period required. No response was received to the targeted consultation.

2.4.7 The issues that have been raised by statutory environmental bodies and councils 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 (**ES Volume I Chapters 6 to 14 [EN010152/APP/6.1].** The **Consultation Report [EN010152/APP/5.1]** considers all comments received during consultation (including those from the public) and how these have been considered and addressed.

2.4.8 In addition, a project website has been set up to provide information on the Scheme: https://www.boom-power.co.uk/fenwick/ and communication

channels (email, Freepost, and phone line) have been open for stakeholders to enquire about the Scheme.

3. Site Selection and Design Evolution

3.1 Overview

3.1.1 **ES Volume I Chapter 3: Alternatives and Design Evolution [EN010152/APP/6.1]** presents an overview of the justification for selecting the land within the Order limits, how the design has evolved since EIA Scoping, and a discussion of the reasonable alternatives considered by the Applicant.

3.2 Site Selection

3.2.1 The selection of the Solar PV Site was informed by the location of the Existing National Grid Thorpe Park Substation (which provides a Point of Connection) and by applying environmental, planning and land use constraints within the City of Doncaster's administrative area.

3.2.2 Once the Applicant established that no available or suitable brownfield land was available for the Scheme, the Applicant sought locations that would avoid best and most versatile (BMV) agricultural land, as shown **ES Volume II Figure 3-3: Exclusion of Best and Most Versatile Agricultural Land [EN010152/APP/6.2].**

3.2.3 The Applicant also sought to avoid internationally and nationally designated biodiversity sites, national landscape designations, areas wholly within Flood Zone 2 and 3, Green Belt, designated heritage assets and woodland, as shown on **ES Volume II Figure 3-4: Planning, Environmental and Land Use Constraints [EN010152/APP/6.2].**

3.2.4 The Applicant then applied land use, land availability, residential proximity, public rights of way and accessibility considerations to the areas of land that remained unconstrained from the above exercise. This led to the identification of land to the northeast, east and southeast of Fenwick for the Solar PV Site.

3.2.5 Additional land to the southwest and southeast of the EIA Scoping Layout was incorporated into the Solar PV Site after non-statutory consultation following positive discussions with landowners in the vicinity of the Solar PV Site. The feedback identified this land as available, suitable and adjacent to the Solar PV Site (with such land predominantly being located in Flood Zone 1) and, despite being identified on national inventory data for woodland, was not occupied by woodland. This additional land provided flexibility for designing the Solar PV Panel arrangement and for providing mitigation areas as part of the Scheme.

3.2.6 The selection of the Grid Connection Corridor has sought to avoid, where practicable, sensitive, residential and commercial properties, heritage features and to minimise the number of affected land interests. It has been subsequently refined based upon ongoing studies and surveys as well as feedback from consultees.

3.3 Alternatives Considered

3.3.1 In accordance with flood risk policy the Applicant has sought to identify suitable and available land for the Solar PV Site which is at low risk from all sources of flooding to confirm if there are reasonably available and suitable areas at lower risk of flooding. This is set out in the Sequential Test Report provided in **Annex C of Appendix 9-3 Flood Risk Assessment, ES Volume II [EN010152/APP/6.3]**. Not all areas at low risk of flooding considered by the Applicant were suitable and available and therefore Flood Zone 2 land and small pockets of Flood Zone 3 land were included in the Solar PV Site.

3.3.2 Other alternatives considered by the Applicant which are discussed in **ES Volume I Chapter 3: Alternatives and Design Evolution [EN010152/APP/6.1]** include:

a. Alternative layouts within the Solar PV Site including access;

b. Alternative solar design technologies; and

c. Alternative routes within the Grid Connection Corridor.

Design Evolution

3.3.3 The layout of the Scheme has evolved taking into consideration environmental effects, the Scheme's objectives and functionality, and feedback from stakeholders and the statutory consultation process. Key changes to the design have included:

a. Selecting fixed south facing solar panels with a maximum height of 3.5m at maximum tilt;

b. Centralising the BESS arrangement which allows it to be contained to a single field rather than spread across the Solar PV Site;

c. Removal of the option to site a new substation along the Grid Connection Corridor (Options 1 and 3 in **ES Volume I Chapter 3: Alternatives and Design Evolution [EN010152/APP/6.1]**);

d. The exclusion of Bunfold Shaw - an Ancient Woodland and Local Wildlife Site - from the Order limits;

e. Additional land being added to the southwest and southeast of the Scheme following non-statutory consultation following positive discussions with landowners in the vicinity of the Solar PV Site. The feedback identified this land as available, suitable and adjacent to the Solar PV Site (with such land being at low risk of flooding);

f. Refinement of the layout plan following desktop analysis, site surveys and consultation feedback, including moving the fence line adjacent to the River Went to the top of the bank and amending a fence line in field SE3;

g. Removal of passing bays along Fenwick Common Lane (owing to its proposed restriction to construction workforce vehicles), reducing the boundary at the junction between Common Lane and Moss Road, slightly increasing the Order limits with the main site access off Moss Road and removal of Fields SW13 and SW14;

h. Careful siting and design of site access points to ensure highway safety and minimise removal of roadside vegetation where practicable;

i. Providing buffers and offsets from existing landscape features such as residential properties, Public Rights of Way (PRoW), trees and hedgerows, and watercourses;

j. Integrating areas of habitat creation (grassland habitat, woodland habitat and screening) into the design of the Solar PV Site;

k. Integrating screening and planting into the Scheme design to reduce visual impact by providing environmental enhancement areas and landscaped offsets and buffer zones; and

l. Carefully locating the larger built elements of the solar farm, such as the On-Site Substation, away from residential dwellings.

4. Scheme Description

4.1 Existing Conditions Within and Surrounding the Site

4.1.1 The landscape features within the Order limits consist predominantly of agricultural fields, mainly under arable production with some areas of pasture, interspersed with individual trees, hedgerows, tree belts (linear) and farm access tracks.

4.1.2 Nearby recreational and residential receptors include, but are not limited to, farms and associated buildings in the immediate vicinity, the village of Fenwick located immediately adjacent to the west of the Solar PV Site, and the villages of Sykehouse and Moss located approximately 1km east and 1km south of the Solar PV Site, respectively. The village of Thorpe in Balne and the hamlets of Hawkehouse Green and Trumfleet are located in proximity to the Grid Connection Corridor.

4.1.3 There is a network of PRoW that surround and cross the Order limits shown on **Figure 5.** There are no national trails or national cycle routes within the Solar PV Site; however, the Grid Connection Corridor intersects the Trans Pennine Trail. The PRoW network is mostly used by local residents for recreational purposes such as dog walking and guided walks by equestrians. Fir Tree Farm Equestrian Centre and the Orchard Equine College & Equestrian Centre lie close to the Order limits.

4.1.4 The Site does not contain any statutory nature conservation designations. The closest designation is Shirley Pool Site of Special Scientific Interest (SSSI) located approximately 900m to the south of the Order limits (this being the section of highway at the junction of the A19 and Station Road in the town of Askern). Shirley Pool SSSI is approximately 3.2km west of the Grid Connection Corridor and approximately 3.3km south-west of the Solar PV Site.

4.1.5 There are four non-statutory Local Wildlife Sites located wholly or partially within the Order limits, one of which, Went Valley LWS, is located in the Solar PV Site and three of which are located in the Grid Connection Corridor. Trumfleet Pond LWS is located wholly within the Grid Connection Corridor whereas Wrancarr Drain and Braithwaite Delves LWS and Trumfleet Pit LWS are all partially located within the Grid Connection Corridor. Further LWS are located in proximity to the Order limits.

4.1.6 There is one area of Ancient Woodland located adjacent to the Order limits, which is also designated as an LWS. This area of woodland is called Bunfold Shaw and is located approximately 15m from the Solar PV Site.

4.1.7 There are no World Heritage Sites, Registered Parks and Gardens, Registered Battlefields, or Protected Wrecks within the Order limits or the Cultural Heritage Study Areas (3km from the Solar PV Site and 1km from the Grid Connection Corridor and the Existing National Grid Thorpe Marsh Substation). There are no designated heritage assets comprising Scheduled Monuments, Listed Buildings and Conservation Areas located within the Order limits, however, there are a number in close proximity to the Order limits. Whilst the scheduled monument Fenwick Hall moated site and six Grade II Listed Buildings are in close proximity to the Solar PV Site, these

assets have been excluded from the Order limits. The scheduled monument Thorpe in Balne moated site, chapel and fishpond, as well as four Grade II and one Grade II* Listed Buildings, are located in close proximity to the Grid Connection Corridor and have also been excluded from the Order limits.

4.1.8 The majority of the Solar PV Site is located within Flood Zone 1 (low risk of flooding) and Flood Zone 2 (medium risk of flooding) with some areas of Flood Zone 3 (high risk of flooding). Flood Zones 2 and 3 are predominantly located to the north and east of the Solar PV Site with west and south-western areas falling in Flood Zone 1 (low risk of flooding). The Grid Connection Corridor is located largely within Flood Zone 3 with smaller areas of Flood Zone 2 along its central section and approximately 700m within Flood Zone 1 toward its northern extent. The Existing National Grid Thorpe Marsh Substation is located entirely within Flood Zone 2, however, the surrounding area is designated as a water storage area with flood defences present along adjacent watercourses. Flood Zones within and adjacent to the Order limits are illustrated in **ES Volume II Figure 9-4: EA Flood Map for Planning (Rivers and Seas) [EN010152/APP/6.2]**.

4.1.9 The Solar PV Site is crossed by Fleet Drain and Fenwick Common Drain, and the River Went is located along its northern boundary. The Grid Connection Corridor is crossed by eight watercourses which, from north to south, include Ell Wood & Fenwick Grange Drain, Moss Road & London Hill Drain, Moss Little Common Drain, Hawkehouse Green Dike, Mill Dike, Wrancarr Drain, Engine Dike, and Thorpe Marsh Engine Drain. The watercourses within the Order limits are shown on **ES Volume II Figure 9-1: Surface Water Features and Attributes [EN010152/APP/6.2]**.

4.2 Description of the Scheme

4.2.1 The Scheme comprises Solar PV Panels and associated infrastructure, including BESS Containers and the On-Site Substation. The Solar PV Panels will convert the sun’s energy into electricity for export to the national electricity transmission network (also known as the national grid) via cables.

4.2.2 The environmental impacts of some conventional forms of power generation are a direct result of the amount of electricity it can generate, for example through the import of fuel to power the process or the level of atmospheric emissions it produces. This is not the case for solar PV energy generation and for this reason it is not proposed that the Scheme is restricted by imposing a limit on how much electricity it can generate. Instead, the Scheme will seek a DCO that would restrict the aspects of the solar farm which have potential environmental impacts – such as the height of the solar panels, dimensions of the associated infrastructure and the On-Site Substation, and where within the Order limits solar panels would be located. These are known as the ‘design parameters’ and are described in the **Outline Design Parameters Statement [EN010152/APP/7.4]**. This approach also ensures the Scheme 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 the future, within the existing design parameters.

Scheme Components

4.2.3 The Scheme will consist of the principal infrastructure described below and in **ES Volume I Chapter 2: The Scheme** [**EN010152/APP/6.1**]. To ensure that the likely significant environmental effects of the Scheme are no worse than those assessed in the EIA, the DCO includes requirements (in Schedule 2) that require the Scheme to be built and operated within the stated **Outline Design Parameters Statement** [**EN010152/APP/7.4**]. The location of the Scheme elements is also controlled via the DCO (in Schedule 1) (**Draft DCO [EN010152/APP/3.1]**) which describes the elements of the Scheme (divided into numbered works packages), and the **Works Plans** [**EN010152/APP/2.2**] which show the maximum areas within which those Scheme elements can be located.

4.2.4 Several 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 industry, the Scheme may utilise technology which does not currently exist and therefore sufficient flexibility needs to be incorporated into the DCO Application.

4.2.5 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 Outline Design Parameters or at sizes and areas within the maximum Outline Design Parameters, the environmental effects will be no greater than those reported in the ES.

4.2.6 The assessments within **Chapters 6** to **14 of the ES [EN010152/APP/6.1]** have assessed the reasonable “worst-case”, or in other words, the maximum parameters are set out in the **Outline Design Parameters Statement [EN010152/APP/7.4].**

4.2.7 The Outline Design Parameters allow for an element of flexibility in the Scheme design. An Indicative Site Layout Plan (**Figure 4**) has been created to provide a visual representation of a tangible example of a scheme that could be constructed within the Outline Design Parameters. The Scheme elements are discussed below, and indicative images of the Scheme equipment are presented in **Plate 3** to **Plate 5.** The location of the Scheme components has been carefully considered and designed around specific areas, to minimise the impacts of these components.

4.2.8 The key Scheme components comprise:

a. Solar PV Panels made up of multiple PV cells which convert sunlight into direct current (DC) electricity. These will be at a maximum height of 3.5 m;

b. Solar PV Mounting Structures arranged in a table format that will be a fixed south facing system which is the most space-efficient layout at this Solar PV Site (see Plate 2);

c. Field Stations (including Field Station Units) incorporating transformers, centralised inverters and switchgear;

d. String inverters as standalone within the Solar PV Panel array if central inverters are not used (shown on Plate 3);

e. On-site cabling required to connect the solar panels to inverters and the inverters to the transformers. Cabling between the solar panels and inverters is typically above ground level (along a row of racks fixed to the mounting structure or fixed to other parts of nearby components) and then underground;

f. BESS Containers and associated infrastructure to store excess electricity generated from the Solar PV Panels or excess energy in the grid. The individual BESS Containers would have built-in gas, heat and smoke detection and an explosion protection system. Firefighting water will be stored on-site in above ground tanks;

g. On-Site Substation within Field SW8 of the Solar PV Site to alter the voltage of electricity generated so that it can be transported to the national grid and to receive excess electricity generated by the Solar PV Panels and from the grid and send to BESS for storage;

h. Grid Connection Cables to transfer electricity between the On-Site Substation and the Existing National Grid Thorpe Marsh Substation.

i. Operations and Maintenance Hub with welfare facilities;

j. Fencing and security measures (for example CCTV);

k. Access tracks;

l. Temporary construction compounds/laydown areas; and

m. Landscaping and biodiversity enhancement which includes new planting, field boundary enhancement and planting of seed mixes.

4.2.9 The potential for a line drop to the On-Site Substation within the Solar PV Site from existing overhead power lines is being explored and will be determined by National Grid if the DCO is granted. Should this option be practicable, this could supersede the requirement for the Grid Connection Corridor.

4.2.10 The Grid Connection Line Drop would comprise of below ground cables connecting the On-Site Substation to a new cable sealing end compound at the base of an existing on-site 400 kV overhead line tower within Field SE2. All works to establish the cable sealing end compound, and works within the cable sealing end compound to modify the tower and connect the Scheme's cables to the NETS would remain under National Grid's control.

4.2.11 At the Field Stations, if the centralised inverters (if used instead of string inverters), transformers and switchgear will be housed together in shipping-type containers such as illustrated in Plate 4, each container measuring 12.5m by 2.5m in footprint and up to 3.5m in height. BESS Containers will also look similar to this.

4.2.12 The perimeter fence of the Solar PV Site is likely to be a 'stock proof fence' or other mesh-type security fencing, such as illustrated in Plate 5. The perimeter fence will be at a maximum height of 2.2m, and there will be a minimum space of 5m from the field edge to the perimeter fence and a further 5m from fence to the Solar PV Panels.

4.2.13 During the construction phase, one or more temporary construction compound(s) will be required as well as temporary roadways to facilitate access to all land within the Solar PV Site and the Grid Connection Corridor.

4.2.14 The proposed planting design (as outlined in the **Framework Landscape and Ecological Management Plan (LEMP) [EN010152/APP/7.14]**) has been developed to integrate the Scheme into its surrounding landscape; to avoid or minimise adverse landscape and visual effects as much as practicable; and to maximise opportunities for delivering net biodiversity gains.

Plate 2: Example South Facing Solar PV Panels

Plate 3: Typical String Inverter Installed Next to Solar PV Panels

Plate 4: Typical Unit Housing the Transformers and Switchgear

Plate 5: Typical Stock Proof Mesh and Wooden Post Perimeter Fencing

4.3 Construction

Construction Programme

4.3.1 Subject to being granted consent and following a final investment decision, the earliest construction could start is in 2028. Construction of the Grid Connection Cables is anticipated to require 12 months, whereas construction of the solar farm will require an estimated 24 months, with operation therefore anticipated to commence in 2030.

Construction Activities

4.3.2 Construction activities will include:

a. Site preparation to include:
   i. Installation of fencing;
   ii. Import of construction materials, plant and equipment to Site;
   iii. The establishment of construction compounds;
   iv. The establishment of the Operation and Maintenance Hub;
   v. Upgrading of existing Site tracks/access roads and construction of new tracks;
   vi. The upgrade or construction of crossing points (bridging structures) over drainage ditches (it is noted that no new permanent culverts will be created as a result of the Scheme; although where existing culverts are to be used they may be strengthened and widened);
   vii. De-culverting of a section of Fleet Drain east of Fenwick Hall; and
   viii. Marking out the location of the infrastructure.

b. Solar PV Site construction to include:
   i. Import of components to the Site;
   ii. Erection of Solar PV Mounting Structures;
   iii. Mounting of Solar PV Panels;
   iv. Installation of electric cabling;
   v. Construction of Field Stations and installation of electrical infrastructure;
   vi. Installation of BESS Containers;
   vii. Construction of the On-Site Substation or Grid Connection Line Drop;
   viii. Implementation of crossing methodologies for watercourses, infrastructure (including roads) and sensitive habitats (e.g. HDD, cable bridging, etc.);
   ix. Testing and commissioning;
   x. Site reinstatement where necessary to avoid negative impacts on the Site and its surroundings; and
   xi. Habitat creation/enhancement.

c. Grid Connection Cables installation:
   i. The establishment of mobilisation areas;
   ii. The establishment of temporary construction compounds;
   i. Stripping of topsoil in sections;
   ii. Trenching in sections;
   iii. Appropriate storage and capping of soil;

iv. Appropriate construction drainage with pumping where necessary;

v. Sectionalised approach of duct installation;

vi. Excavation and installation of jointing pits and link box pits;

vii. Cable joint and link box installation;

viii. Cable pulling; and

ix. Implementation of crossing methodologies for watercourses, infrastructure (including roads and rail), and sensitive habitats (HDD).

x. Testing and commissioning; and

xi. Site reinstatement, including topsoil reinstatement and repair and reinstatement of damaged field drainage.

4.3.3 It is anticipated that construction activities would be carried out in a sequential manner with construction teams responsible for specific type of works moving across the Solar PV Site. In this case, the works would start with fencing, followed by frame installation, Solar PV Panel installation, and cabling and connection. It may be possible to generate power from some areas of the Solar PV Site whilst other areas are still being built, providing the associated On-Site Substation and Grid Connection Cables or Grid Connection Line Drop are in place, and subject to testing and commissioning.

4.3.4 The location of temporary construction compounds and indicative HDD Areas are presented in **Figure 7.**

Construction Access and Traffic

4.3.5 A **Framework Construction Traffic Management Plan (CTMP) [EN010152/APP/7.17]** has been prepared as part of the DCO Application. This will be updated to a detailed CTMP post-consent and prior to the start of construction. The aim of the CTMP is to minimise the impact of construction traffic on local communities by managing traffic using the local highway network, and where required/possible implementing mitigation. The **Framework CTMP [EN010152/APP/7.17]** defines information such as the routes that construction traffic must take, any timing restrictions in relation to the use of certain routes, and the penalties to contractors if the CTMP is not adhered to.

4.3.6 Vehicle swept path analysis has been conducted on Heavy Good Vehicle (HGV) routes where pinch points have been noted using the largest vehicle assumed to utilise the roads (maximum legal articulated vehicle). Abnormal Indivisible Loads (AIL) vehicles, which are larger than standard HGVs, have also been analysed along these routes to ensure safe journeys along the road network. The vehicle swept paths also demonstrate that construction vehicles will be able to turn in/out of the proposed site accesses.

4.3.7 All HGVs (trucks and lorries) will travel along the public highway to one of the Construction Compounds. It is anticipated that goods would be delivered to the main construction compound within the Solar PV Site and then

distributed to the point of need within the Site using a lighter vehicle tractor and trailer as required.

4.3.8 To reduce site traffic on local roads, it is proposed to utilise internal routes through the Solar PV Site where practicable as the primary route for deliveries and staff movements.

4.3.9 It is anticipated that as a worst case there could be up to a total of 18 Heavy HGV deliveries per day (including waste movements). This results in 36 HGV two-way movements (18 in and 18 out) per day at peak construction. All HGVs will enter the Solar PV Site via the main site access off Moss Road.

4.3.10 There would be a maximum of five Abnormal Indivisible Loads (AIL) vehicles, which are larger than standard HGVs, deliveries (10 two-way movements) for the delivery of the 400 kV/33 kV transformer to the On-Site Substation.

4.3.11 Construction staff are expected to travel by private car or use shuttle minibus services which will be provided to transfer staff to/ from key settlements where workers would be expected to originate.

4.3.12 To prevent nuisance and potential obstruction/restriction of free traffic flows caused by vehicles parked around the Site, limited (but sufficient) on-site car parking to accommodate the expected parking demand of construction staff using private vehicles to travel to and from Site (commuting) would be provided within the Site. Parking on public roads within a defined radius of the Site would not be permitted.

4.3.13 Where practicable the Scheme will utilise existing access tracks. Where required new access tracks will be constructed across the Solar PV Site. These would typically be 4.0m wide (8.0m wide for BESS Container access tracks) compacted stone tracks with gradient slopes on either side (where required). Track matting may be used if ground conditions dictate and passing places created where required.

4.3.14 Currently existing accesses are proposed to be used for construction access to the Site where this is practicable. Accesses have been designed to ensure there are no impacts on veteran and mature trees as a result of vehicles movements, however, there may be localised removal of sections of hedgerows where required.

4.3.15 An assessment of Transport and Access is presented in **ES Volume I Chapter 13: Transport and Access** and presented in its appendices (**ES Volume III, Appendix 13-1** to **Appendix 13-4**).

Construction Staff

4.3.16 Based on the Applicant's experience of other similar sized solar projects, it is currently estimated the Scheme will generate an average of 200 full-time equivalent (FTE) on-site staff per day during the construction phase. The size of the workforce is based on activities required and will fluctuate during the phase, therefore, being both higher and lower than average at times.

4.3.17 Up to 250 FTE staff per day are expected to be required to work on the Scheme during the peak construction phase, which is likely to include construction of the On-Site Substation, Grid Connection Corridor or Line

Drop and solar PV infrastructure. This is expected to be a worst case based on the build out programme, and there will be noticeably fewer workers outside peak activities.

Construction Hours of Work

4.3.18 The core working hours are defined as:

a. Monday to Friday 07.00 to 19.00 (daylight hours permitting);

b. Saturday 07.00 to 13.00 (daylight hours permitting); and

c. No Sunday or Bank Holiday working unless crucial to construction (i.e., unable to stop a process safely).

4.3.19 Emergency working may extend beyond the times quoted above timescales.

4.3.20 Working hours may be shortened if working would necessitate artificial lighting and therefore the working day will be shorter in months with reduced daylight hours. It is not possible to avoid working in the winter period due to the length of construction programme. However, cabling and groundworks will be prioritised during the drier summer months where practicable.

4.3.21 As an exceptional activity horizontal directional drilling may require 24-hour working, particularly to cross the railway to limit disruption to rail services and the relevant Local Planning Authority will be notified in advance of any proposed 24 hour working or working otherwise proposed outside of the core working hours identified above.

4.3.22 Additionally, quiet non-intrusive works such as the installation of Solar PV Panels may take place over longer periods during the high summer and other quiet non-intrusive works such as electrical testing, commissioning and inspection may take place over longer periods throughout the year.

Construction Controls

4.3.23 The construction phase will be subject to management documents which will limit and control activities. The framework documentation has been prepared as part of the DCO Application:

a. Framework Construction Environmental Management Plan (CEMP) [EN010152/APP/7.7];

b. Framework Soil Management Plan (SMP) [EN010152/APP/7.10];

c. Framework PRoW Management Plan (PRoW MP) [EN010152/APP/7.13];

d. Framework Skills, Supply Chain and Employment Plan [EN010152/APP/7.15];

e. Framework Construction Traffic Management Plan (CTMP) [EN010152/APP/7.17]; and

f. Framework Site Waste Management Plan (SWMP) [EN010152/APP/7.18].

4.3.24 The production of detailed (construction issue) versions of these plans will be secured through DCO requirements, meaning that they must be in place

before development can lawfully begin. These detailed plans must be substantially in accordance with the Framework plans listed above. A Water Management Plan will be prepared in advance of construction again secured through DCO Requirement 11.

4.4 Operation

4.4.1 The operational life of the Scheme is 40 years, with decommissioning to commence 40 years after final commissioning (currently anticipated to be 2030, meaning decommissioning would be 2070).

4.4.2 During the operation and maintenance phase, activity on the Solar PV Site would be restricted principally to vegetation management (including grazing or mowing), equipment maintenance and servicing (including panel cleaning), periodic replacement of components, periodic fence inspection, and monitoring to ensure the continued effective operation and maintenance of the Scheme.

4.4.3 It is anticipated there would be up to two permanent staff on-site at any one time during the operation and maintenance phase, based at the Operations and Maintenance Hub. Additional staffing/visitors, such as maintenance workers and deliveries, would be occasional as needed. It is assumed this would equate to an average of four additional workers per month.

4.4.4 Along the route of the Grid Connection Cables, the land will be reinstated to its original condition and land use at the end of the construction phase. Therefore, operation and maintenance activity will consist of routine inspections and any reactive maintenance such as where a cable has been damaged (this will be infrequent and very localised).

Operational Controls

4.4.5 The operation and maintenance phase will be subject to management documents which will limit and control activities. The framework documentation produced with the DCO Application to mitigate effects associated with this phase includes:

a. **Framework Operational Environmental Management Plan (OEMP) [EN010152/APP/7.8];**
b. **Framework Landscape and Ecological Management Plan (LEMP) [EN010152/APP/7.14];**
c. **ES Volume III, Appendix 9-4: Framework Drainage Strategy [EN010152/APP/6.3];** and
d. **Framework Battery Safety Management Plan [EN010152/APP/7.16].**

4.4.6 Again, the delivery of detailed versions of these plans will be secured through DCO requirement. These detailed plans must be substantially in accordance with the Framework plans listed above.

4.5 Decommissioning

4.5.1 Decommissioning is expected to take between 12 and 24 months and could be undertaken in phases.

4.5.2 All Solar PV Panels, Solar PV Mounting Structures, cabling, inverters, transformers, switchgear, BESS Containers and the containerised unit of the Operations and Maintenance Hub would be removed from the Solar PV Site and recycled or disposed of in accordance with good practice and market conditions at that time.

4.5.3 The future of the On-Site Substation and the Grid Connection Cables or Grid Connection Line Drop would be agreed with National Grid Electricity Transmission Plc (NGET) and/or the asset owners prior to the commencement of decommissioning and taking into account market conditions and environmental good practice at the time.

4.5.4 Currently, the most environmentally acceptable option for the decommissioning of the Grid Connection Cables (if not retained) is considered to be leaving the cables in place to avoid disturbance to overlying land and habitats and to neighbouring communities. Alternatively, the cables can be removed by opening up the ground at regular intervals and pulling the cable through to the extraction point, avoiding the need to open up the entire length of the Grid Connection Corridor.

4.5.5 Upon decommissioning, the all the land within the Order limits will be returned to landowners, including the established habitats. Any impacts to important ecological features present at the time of decommissioning will be mitigated fully in line with relevant legislative and policy requirements.

4.5.6 The effects of decommissioning are usually similar to, or of a lesser magnitude, than construction effects and are considered in the relevant sections of the ES. The specific method of decommissioning the Scheme at the end of its design life is uncertain at present as the engineering approaches to decommissioning would evolve over the design life of the Scheme. Assumptions have therefore been made where appropriate. Decommissioning would be undertaken safely and with regard to the environmental legislation at the time of decommissioning, including relevant waste legislation.

4.5.7 A Framework Decommissioning Environmental Management Plan (DEMP) will be prepared prior to decommissioning and will be secured through a DCO requirement. A **Framework DEMP [EN010152/APP/7.9]** is included with the DCO Application.

5. Assessing Environmental Effects

5.1 Topics Assessed

5.1.1 **ES Volume I Chapters 1 to 5 [EN010152/APP/6.1]** provide an introduction to the policy and legislative context, a description of the Solar PV Site and surrounds, an overview of the Scheme and alternatives that were considered during the design process, and the approach and methodology to the EIA.

5.1.2 The following topic specific chapters have been produced and assessed in **ES Volume I [EN010152/APP/6.1]**:

- **a. Chapter 6: Climate Change;**
- **b. Chapter 7: Cultural Heritage;**
- **c. Chapter 8: Ecology;**
- **d. Chapter 9: Water Environment;**
- **e. Chapter 10: Landscape and Visual Amenity;**
- **f. Chapter 11: Noise and Vibration;**
- **g. Chapter 12: Socio-Economics and Land Use;**
- **h. Chapter 13: Transport and Access;**
- **i. Chapter 14: Other Environmental Topics, including:**
  - i. Air Quality;
  - i. Glint and Glare;
  - ii. Ground Conditions;
  - iii. Major Accidents or Disasters;
  - iv. Telecommunications and Utilities;
  - v. Electric and Electro-magnetic Fields; and
  - vi. Materials and Waste.

5.1.3 **ES Volume I Chapter 15: Cumulative Effects and Interactions [EN010152/APP/6.1]** describes cumulative effects and effect interactions that lead to combined effects on sensitive receptors.

5.1.4 **ES Volume I Chapter 16: Summary of Environmental Effects [EN010152/APP/6.1]** presents a brief summary of the ES outlining the significant effects identified in the environmental impact assessment process.

5.2 ES Terminology

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 **ES Volume I [EN010151/APP/6.1]**.

5.2.2 Each of the technical chapters within **ES Volume I [EN010152/APP/6.1]** provides further description and definition of the significance criteria relevant to each topic. Where practicable, 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’. As the design of the Scheme has evolved, the Applicant has worked with environmental specialists to ensure the design avoids or reduces environmental effects on receptors wherever possible through the use of embedded mitigation measures (meaning measures that form part of the design or methods for construction or operation and maintenance), such as the use of environmental management plans. Following the incorporation of embedded mitigation, where the EIA predicts a significant adverse effect on one or more receptors, consideration is given to whether there are further additional mitigation measures which could avoid or reduce the effect further, or to reduce the likelihood of it happening. These measures are taken into account in the EIA and assessment of effects of the Scheme. Identified embedded and additional mitigation is secured through the DCO, should it be granted, and this is made clear in the ES.

6. Findings of the Environmental Statement (ES)

6.1.1 It is the duty of the UK Government to achieve 'net zero' carbon emissions by 2050. 'Net Zero' refers to achieving net zero carbon dioxide emissions from electricity generation, industry, transport, and domestic sources by balancing greenhouse gas (GHG) 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.

6.1.2 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.

6.1.3 The conclusions on the likely significant environmental effects of the Scheme are described within **ES Volume I [EN010152/APP/6.1]**. This section provides a non-technical summary of the overall findings of the ES.

6.2 Climate Change

6.2.1 **ES Volume I Chapter 6: Climate Change** presents the findings of an assessment of the likely significant effects of the Scheme on the Climate (for example, greenhouse gas emissions from the construction, operation and maintenance, and decommissioning of the Scheme), outlines the potential effects of Climate Change both on the Scheme and on surrounding receptors as a result of the Scheme and provides information on embedded mitigation measures.

Baseline and Context

6.2.2 Consideration has been given to the following aspects of Climate Change assessment:

a. Lifecycle GHG impact assessment – the impact of GHG emissions arising over the lifetime of the Scheme on the Climate;

b. Climate change risk assessment (CCRA) – the resilience of the Scheme to projected future Climate Change impacts, including damage to the Scheme caused by accidents resulting from Climate Change; and

c. In-combination climate change impact (ICCI) assessment – this assessment identifies how the resilience of receptors in the surrounding environment are affected by the combined impact of future climate conditions and the Scheme.

Greenhouse Gas Assessment

6.2.3 A GHG assessment has been conducted which covers all direct GHG emissions arising from activities undertaken at the Solar PV Site during the construction, operation (including maintenance), and decommissioning of the

Scheme. It also includes indirect emissions embedded within the construction products (e.g. Solar PV Panels and Cables) and materials (e.g. the steel required to construct the Solar PV Mounting Structures) arising as a result of the energy used for their production, as well as emissions arising from the transportation of products and materials, waste, and construction workers.

6.2.4 The current baseline applied for the GHG assessment is a “no development” scenario where the Scheme is not implemented. While the current land use within the Order limits may have minor levels of associated GHG emissions, it is anticipated that these emissions are not material. Therefore, for the purposes of the lifecycle GHG impact assessment, a GHG emissions current baseline of zero is applied.

6.2.5 The future baseline similarly assumes a ‘business as usual’ scenario whereby the Scheme is not implemented. The future baseline comprises of existing carbon stock and sources of GHG emissions within the Order limits from the existing activities on-site. This includes the operational emissions from the generation of electricity that would occur should the Scheme not go ahead but which are displaced in the case of the Scheme being delivered. Embodied GHG emissions are considered zero in the future baseline, as the land use within the Order limits has minor levels of associated GHG emissions from agricultural activities and minor carbon sequestration from vegetation.

6.2.6 The receptor for the lifecycle GHG impact assessment is the global climate.

Climate Change Risk Assessment

6.2.7 The current baseline for the CCRA and ICCI assessment is the climate in the location of the Scheme for the 30-year period of 1981 to 2010 (the standard baseline for climate data). This is based on historic climate data recorded by the closest Met Office station to the Scheme (Finningley, approximately 16 miles south of the Scheme) for the 30-year climate period of 1981 to 2010.

6.2.8 The future baseline is expected to differ from the present-day baseline. These have been calculated derived from the United Kingdom Climate Change Projections 2018 (UKCP18).

6.2.9 The receptor for the Climate Change Risk Assessment is the Scheme itself, including all infrastructure, assets, and workers on-site during construction, operation and maintenance, and decommissioning.

In-Combination Climate Change Impact Assessment

6.2.10 The current and future baselines for the ICCI assessment are as described for the CCRA (Paragraphs 6.2.7 and 6.2.8).

6.2.11 In the ICCI assessment, sensitive receptors are determined by each technical discipline. The assessment is undertaken in regard to the identified sensitive receptors and summarised in **ES Volume I Chapter 6: Climate Change [EN010152/APP/6.1]**.

Assessment of Effects

Greenhouse Gas Assessment

6.2.12 The GHG impact of construction and decommissioning are anticipated to result in **minor adverse, not significant** effects on the climate, while the impacts of the operation and maintenance of the Scheme is considered to have a **beneficial, significant effect**. For a detailed explanation of how these significance levels were determined, please refer to **ES Volume I, Chapter 6: Climate Change [EN010152/APP/6.1]**.

6.2.13 GHG emissions savings are expected to be achieved against the baseline scenario when considering the full lifetime of the Scheme. Therefore, the GHG emissions during construction, operation and maintenance, and decommissioning of the Scheme can be considered to be balanced by the net positive impact of the Scheme on GHG emissions and the UK's ability to meet its carbon targets.

6.2.14 The GHG savings achieved over 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 GHG intensity will not decrease as projected, which could adversely affect the UK's ability to meet its carbon reduction targets.

6.2.15 As the GHG impact of the Scheme is beneficial because it will play a part in supporting the UK's trajectory towards net zero and avoids atmospheric GHG emissions when assessed against the comparable baseline, it is considered the Scheme overall is considered to have a **beneficial, significant effect** on the climate.

Climate Change Risk Assessment

6.2.16 The assessment has considered the resilience of the Scheme to impacts of Climate Change and measures such as flood resilience have been integrated into the Scheme design.

6.2.17 Future Climate Change projections have been reviewed and the sensitivity of the Scheme's assets to the impacts of a changing climate have been examined. This review considers the adequacy of the Climate Change resilience measures built into the Scheme and whether they are sufficient to mitigate significant effects on the Scheme's assets. As a result of the proposed resilience measures **no significant** Climate Change risks during the construction, operation and maintenance, and decommissioning phase have been identified.

In-combination Climate Change Impact Assessment

6.2.18 Future Climate Change projections have been reviewed and the sensitivity of identified sensitive receptors to these hazards examined as part of the In-combination Climate Change Impact Assessment. **No significant effects** as a result of the effects of the Scheme combined with the impacts of Climate Change have been identified.

Mitigation Measures

6.2.19 A number of embedded construction, operation and maintenance, and decommissioning mitigation measures are included within the Scheme, which are outlined in the **Framework Construction Environmental Management Plan (CEMP) [EN010152/APP/7.7]**, **Framework Operational Management Plan (OEMP) [EN010152/APP/7.8]**, and **Framework Decommissioning Environmental Management Plan (DEMP) [EN010152/APP/7.9]** and include measures such as switching off vehicles when they are not in use. The **Framework CEMP, OEMP** and **DEMP** also include Climate Change resilience measures embedded in the Scheme. These include measures such as the production of health and safety plans accounting for potential Climate Change impacts on workers. The implementation of the mitigation measures detailed in the framework management plans is secured through DCO Requirements for final management plans to align with the framework plans.

6.2.20 No additional mitigation measures or enhancements are required.

Cumulative Effects

6.2.21 Climate change is the result of cumulative impacts as it is the result of innumerable minor activities. A single activity may itself result in a minor or insignificant impact, but when combined with many other activities, the cumulative impact could be significant. The nature of GHGs is such that their impact on the global climate is not affected by the location of their source. The GHG emissions assessment by its nature is a cumulative assessment and considers whether the Scheme would contribute significantly to emissions on a national level.

6.2.22 It is not possible to define a Study Area for the assessment of cumulative effects of GHG emissions, as the identified receptor is the global climate and effects are therefore not geographically constrained. However, the Scheme will lead to **significant beneficial effects** on the climate and therefore would not contribute to any significant adverse cumulative effects.

6.3 Cultural Heritage

6.3.1 **ES Volume I Chapter 7: Cultural Heritage [EN010152/APP/6.1]** presents the assessment of the likely significant effects of the Scheme on cultural 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.

Baseline and Context

6.3.2 There are no designated heritage assets located within the Order limits. There are five non-designated heritage assets (four within the Solar PV Site and one within the Grid Connection Corridor) recorded on the Historic Environment Record (HER) located within the Order limits. In addition, archaeological evaluation surveys undertaken within the Order limits have identified areas of buried archaeological remains within the Solar PV Site

and the desk-based assessment has identified a high potential for buried archaeological remains to be located within the Grid Connection Corridor.

6.3.3 Within the defined Study Areas from the Order limits (including the 3km Study Area from the Order limits for designated heritage assets, the 1km Study Area from the Grid Connection Corridor for designated heritage assets and the wider 5km Study Area for designated heritage assets of the highest value (scheduled monuments, Grade I and II* listed buildings)) there are 62 designated heritage assets comprising scheduled monuments, listed buildings and conservation areas.

6.3.4 Within the 1km Study Area from the Order limits for non-designated heritage assets, there are 52 non-designated heritage assets, comprising find spots, archaeological sites and buildings.

Assessment of Effects

6.3.5 The assessment of effects has been undertaken while taking embedded mitigation for the Scheme into account. These measures include landscaping/screening around parts of the perimeter of the Scheme and heritage buffer areas around heritage assets (such as Scheduled Monuments, listed buildings and buried archaeological remains) to reduce impacts on the setting of heritage assets and avoid physical impacts to buried archaeological remains identified from evaluation surveys undertaken for the Scheme.

6.3.6 During the construction phase of the Scheme, there is the potential for physical impacts and/or impacts through change to the setting of heritage assets as a result of construction activities which includes but is not limited to, the presence and movement of construction plant and equipment; the siting of construction compounds; noise and lighting; increased traffic volumes; any below ground activities including but not limited to groundworks, planting, earth-moving operations, topsoil removal, trenches for cabling, the installation of Solar PV Panels and associated infrastructure; and the introduction of the physical form and appearance of the Scheme.

6.3.7 During the operation and maintenance phase of the Scheme, there is the potential for impacts through change to the setting of heritage assets as a result of operation and maintenance activities which includes but is not limited to, the continued presence of the physical form and appearance of the Scheme; increase in traffic movements; operational lighting and/or noise.

6.3.8 During the construction phase of the Scheme, **moderate adverse significant effects** have been identified for the following heritage assets arising from construction activities and the physical presence of the Scheme:

a. Scheduled Monument Thorpe in Balne moated site, chapel and fishpond [1012111] including Grade II* listed remains of chapel [1286641];

b. Scheduled Monument Fenwick Hall moated site [1012459];

c. Non-designated buried archaeological remains located within the Solar PV Site [02791/01, 05633, AEC004 – AEC021];

d. Undated cropmark and earthwork, Moss [02531/01]; and

e. Potential previously unknown non-designated buried archaeological remains located within the Grid Connection Corridor dating to the prehistoric, Roman, medieval and post-medieval periods.

6.3.9 The impact of the introduction of the physical form and appearance of the Scheme during construction will result in a continued effect on the setting of the scheduled monument Fenwick Hall moated site [1012459] through the operation and maintenance phase of the Scheme. This impact is long-term for the lifespan of the Scheme, but is considered to be reversible upon decommissioning of the Scheme.

6.3.10 Heritage assets in proximity to the Grid Connection Corridor would not be impacted by the operational Scheme, as below-ground components would preclude change within their setting. Therefore, no impact is anticipated during the operation and maintenance phase of the Scheme on the Thorpe in Balne moated site [1012111], including Grade II* listed remains of chapel [1286641] and Glebe Farmhouse [1192743] and associated barn [1314794].

6.3.11 It is not expected that the operation and maintenance of the Scheme would result in any further intrusive activities, and as such no impact to below ground archaeological remains is anticipated during this phase.

6.3.12 During the decommissioning phase of the Scheme, it is considered that the Scheme, including the solar panels and associated infrastructure will be removed 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. Any future maintenance, decommissioning and/or reinstatement works would be subject to prevailing legislation, guidance and permitting regimes. Landscape restoration and remediation to suitable surfaces would be undertaken which will result in the restoration of the rural landscape.

6.3.13 A well-designed decommissioning scheme would not have any impact beyond the already-disturbed footprint of the Scheme; therefore, it is not anticipated that there will be additional impacts on below ground archaeological remains during decommissioning activities.

6.3.14 During the decommissioning phase of the Scheme, there would be temporary effects to the setting of designated heritage assets located within the defined Study Areas. Decommissioning activities are likely to affect the setting of those heritage assets described for the construction phase above. However, effects would be no greater than those assessed during construction and **no additional significant effects** through change to the setting of heritage assets are considered likely over and above those already identified during the construction phase of the Scheme.

6.3.15 All long-term (for the design life of the Scheme) 'reversible' effects reported in **ES Volume I Chapter 7: Cultural Heritage [EN010152/APP/6.1]** will be removed during the decommissioning phase. They have been reported as long-term (for the lifespan of the Scheme) due to the length of time they will be in place, but they remain reversible and will be removed upon decommissioning of the Scheme.

Mitigation Measures

6.3.16 The following embedded mitigation measures have been incorporated into the Scheme design:

a. Avoidance – where practicable, cultural heritage assets have been avoided in order to reduce or remove potential impacts upon them, via heritage buffer areas. These avoidance measures have been implemented in a staged, iterative manner as the potential impacts of the Scheme are understood.

b. Reduction – areas of soft landscaping/screening around parts of the perimeter of the Scheme have been built into the design of the Solar PV Site. The aim is to screen the panel arrays and associated infrastructure from view and thus reduce impact upon the settings of heritage assets. This landscaping has been carefully considered to integrate itself into the existing landscape and largely comprises the enhancement of existing hedgerows/boundaries.

c. Investigation – a programme of archaeological evaluation surveys of the Solar PV Site has been undertaken. This has identified areas of archaeological interest that have been set out as Heritage Buffer Areas within the Scheme design to enable preservation in-situ of these remains.

6.3.17 Significant effects have been identified on known and potential buried archaeological remains located within the Order limits. Additional mitigation measures are proposed, which could include design measures such as micro-siting of Scheme elements and the use of pre-cast concrete blocks rather than piled mounts within the Solar PV Site to enable preservation in-situ of archaeological remains, and/or archaeological excavation and recording where avoidance by design cannot be implemented. The mitigation measures will be set out within the Final Archaeological Mitigation Strategy (AMS) which will be secured by a requirement of the DCO and must be substantially in accordance with the **Draft AMS [EN010152/APP/7.19]** submitted as part of this DCO Application. With the implementation of embedded or additional mitigation measures set out within the Final AMS, it is considered that there would be no significant residual effects on buried archaeological remains within the Order limits.

6.3.18 A significant effect has been identified on the scheduled monument Thorpe in Balne moated site [1012111], including Grade II* listed remains of chapel [1286641] as a result of construction activities within the Grid Connection Corridor. Due to the temporary nature of this effect, no additional mitigation is proposed, therefore a significant residual effect remains.

6.3.19 A significant effect has been identified on the scheduled monument Fenwick Hall moated site [NHLE 1012459] as a result of the introduction of the physical form and appearance of the Scheme at construction, and the continued effect on the setting of this asset through the operational and maintenance phase of the Scheme. This effect is considered to be reversible upon decommissioning of the Scheme, and as such no additional mitigation is proposed, therefore a significant residual effect remains.

Cumulative Effects

6.3.20 A significant cumulative effect has been identified upon two Grade II listed buildings at Riddings Farm comprising the Barn and granary (at Riddings Farm) [NHLE 1151610] immediately to northwest of Lily Hall, and the Dovecote and attached outbuilding on west side of farmyard at Riddings Farm [NHLE 1151611]. This moderate adverse cumulative effect is due to the consented demolition of the associated Grade II listed 'Lily Hall' farmhouse [NHLE 1151609] (22/01536/FUL and 22/01537/LBC) and the resultant additional erosion of the functional and historical setting of the farmstead's buildings in combination with the effects of the Scheme. No suitable mitigation has been identified to reduce the significant cumulative effect to a non-significant level and so a significant residual cumulative effect remains on the two listed farmstead buildings.

6.4 Ecology

6.4.1 **ES Volume I Chapter 8: Ecology [EN010152/APP/6.1]** presents the findings of an assessment of the likely significant effects of the Scheme on ecology, which has been informed by a desk study and ecological field surveys. The assessment considers effects on designated sites, habitats, and protected species and identifies and proposes measures to address the potential impacts and likely significant effects of the Scheme on ecology, during the construction, operation (including maintenance), and decommissioning phases.

Baseline and Context

6.4.2 A desk study was undertaken to identify sites designated for their biodiversity value and records of protected and/or notable habitats and species (ecology features) and invasive non-native species (INNS) that are relevant to the Scheme. The Doncaster Local Records Centre were contacted in February and November 2023 to gain information on pre-existing ecological data (i.e. location of Local Wildlife Sites (LWS) existing records of protected, notable, and invasive non-native species within 2km of the Order limits). A review of available online data was also undertaken using a range of sources (as detailed in **ES Volume I Chapter 8: Ecology [EN010152/APP/6.1]**).

6.4.3 Ecological field surveys were undertaken in 2023 and 2024, to characterise the ecological baseline within the relevant Study Areas. Details of the survey areas, methods, results, survey periods and guidance that has been used for each survey are presented in Table 8-1 of **ES Volume I Chapter 8: Ecology [EN010152/APP/6.1]** and in **ES Volume III Appendices 8-2 to 8-9 [EN010152/APP/6.3].** Ecological features considered in the ES include species and habitats that are important at an international, national, and local level (i.e., how rare and important the species and habitats are). The desk study and UK Habitat Classification (UKHab) surveys undertaken show that the majority of the land within the Order limits consists of arable land, with areas of grassland (including Coastal and Floodplain Grazing Marsh), watercourses and water bodies, woodland, developed land, sparsely vegetated land (including assumed Open Mosaic Habitat on Previously Developed Land), introduced shrub, trees and hedgerows throughout.

6.4.4 The desk study identified three international statutory sites for their biodiversity value within 10km of the Order limits (Special Areas of Conservation (SAC), Special Protection Areas (SPA) and Ramsar sites) and one national statutory designated site for its biodiversity value (Sites of Special Scientific Interest (SSSI), National Nature Reserves (NNR) and Local Nature Reserves (LNR)) within 2km of the Order limits. No SACs designated for bats were identified within 30km of the Order limits.

6.4.5 There are 46 non-statutory sites designated for their biodiversity value identified within 2km of the Order limits (Local Wildlife Site (LWSs), Sites of Importance for Nature Conservation (SINCs) and Candidate and Historic LWS). Four of these sites, namely Went Valley (Part) LWS, Wrancarr Drain and Braithwaite Delves LWS, Trumfleet Pit LWS and Trumfleet Pond LWS lie within the Order limits. Went Valley (Part) LWS is within the Solar PV Site but is avoided and outside of the developable areas of the Scheme. The other three sites are within the Grid Connection Corridor.

6.4.6 A UKHab survey of the Order limits was carried out over several survey visits, between March and April 2023 and between April 2024 and September 2024. The following protected species surveys and/or associated data analysis have been undertaken: reptiles, badgers, bats, aquatic macrophyte and macroinvertebrate, fish, birds (breeding and non-breeding) and riparian mammal surveys. More detailed hedgerow surveys have also been undertaken where required. Through discussion with Natural England, it has been agreed that the potential impacts to great crested newts (GCN) can be offset through a District Level Licence (DLL). The Scheme currently holds a provisional Impact Assessment and Conservation Payment Certificate (IACPC) from Natural England and the Applicant is in the process of obtaining the full IACPC.

6.4.7 An arboricultural survey was also carried out of the trees within the Order limits, to determine their value and root protection areas, and identify the need for avoidance or mitigation. The findings are presented in **ES Volume III Appendix 10-7: Arboricultural Impact Assessment [EN010152/APP/6.3].**

Assessment of Effects

6.4.8 Effects on ecological features from infrastructure projects can arise from direct and indirect impacts upon designated sites, habitats or species, and be of a temporary or permanent nature. Indirect effects can occur for example through pollution of air and water, and via changes in lighting, noise or hydrology.

6.4.9 With the implementation of suitable embedded mitigation (see below), the assessment of effects on important ecological features has concluded that the construction, operation (including maintenance), and decommissioning phases of the Scheme are unlikely to result in significant residual effects to the majority of the important species, habitats and designated sites.

6.4.10 Construction activities are predicted to result in the loss of sections of hedgerow (minimised as much as is practicable) as a result of security fencing and access routes across the Solar PV Site and to facilitate works within the Grid Connection Corridor. The majority of hedgerows across the

Order limits have been avoided and will be retained, however approximately 3.99km of hedgerow, including small sections from four 'important' hedgerows, will require removal. Without mitigation this could potentially lead to a 'Minor Adverse' impact. While this is considered '**Not significant'** in EIA terms, embedded mitigation in the form of replanted hedgerows (implemented through the **Framework Landscape and Ecological Management Plan (LEMP**) which will be secured by a DCO requirement) has been implemented which reduces the impact of the effect down to 'Minor Beneficial' which will result in an eventual net gain in this habitat type.

6.4.11 Construction activities within the Grid Connection Corridor will result in the temporary loss of a small area of assumed Open Mosaic Habitat on Previously Developed Land. While this habitat will be reinstated following completion of the works, this will take some time to establish. Reinstatement of the habitat will follow a management which will reduce the effect to 'Minor Adverse' level which is deemed **not significant** in EIA terms.

6.4.12 The construction of the Scheme will result in temporary disruption to Aquatic macro-invertebrates/macrophytes and fish due to the required use of open-cut techniques in some locations. Despite the temporary impact the overall effect level is deemed as 'Minor Adverse' which is deemed **not significant** in EIA terms. All other ecological features for which likely impacts during construction were identified, were reduced to 'Negligible' or 'Minor Beneficial' following embedded mitigation.

6.4.13 There are no adverse effects on designated sites anticipated during construction. LWS' are to be avoided and protected from impacts with perimeter fencing, and there are no air pollution impacts upon statutorily designated sites anticipated as a result of the construction works. Impacts on internationally designated sites are also not significant, with no loss of functionally linked land as discussed within the **No Significant Effects Report [EN010152/APP/7.12].**

6.4.14 During operation and maintenance there are potential electromagnetic field (EMF) effects on fish from cables buried beneath watercourses, which could impede movement and disrupt feeding behaviour. Without mitigation this could lead to a moderate adverse effect, however, in increasing the HDD depth to five meters at Thorpe Marsh Drain, Engine Dike, Wrancarr Drain and Mill Dike to lower EMF exposure will reduce the residual effect to 'Minor Adverse' which is deemed **not significant** in EIA terms.

6.4.15 The effects of decommissioning of the Scheme are likely to be similar to those for construction, but with recognition that many of the potential impacts associated with the construction of the Scheme, such as building of infrastructure, e.g. substation and laying of cables, will not be relevant during decommissioning. As such, the conclusions drawn between Paragraphs 6.4.10 and 6.4.13 are expected to represent a worst-case scenario.

6.4.16 No residual significant effects on important ecological features are anticipated to occur due to the construction, operation (including maintenance) and decommissioning of the Scheme, with the implication of suitable embedded and additional mitigation. The effects during construction and decommissioning are anticipated to be mainly **minor adverse** and

negligible, with **minor beneficial** (**not significant**) effects associated with habitat improvements during the reinstatement of existing habitats.

6.4.17 The proposed planting design (as outlined in the **Framework LEMP [EN010152/APP/7.14]**) includes the creation of new hedgerows, enhancement of existing hedgerows, planting of native scrub, neutral grassland, modified grassland, wet grassland, grassland scrapes, as well as enhancement of the riparian zone of the River Went within the north of the Solar PV Site. There will be an Ecology Mitigation Area, providing a large, contiguous area dominated by neutral grassland which offers habitat for a range of protected and notable species such as birds, small mammals, bats, reptiles and amphibians. In addition, areas beneath solar panels and in areas without solar panels will be planted with grassland. Additional hedgerow and tree planting will provide further suitable habitat for a range of species and help to maintain connectivity across the Order limits.

6.4.18 The **Biodiversity Net Gain (BNG) Assessment Report [EN010152/APP/7.11]** quantifies the overall effect of the Scheme upon the Solar PV Site's biodiversity value by comparing the Solar PV Site's current (baseline) habitat value with that of the Scheme. Calculations consider the level of proposed habitat loss, retention, enhancement and/or creation delivered by the Scheme and are measured using the Statutory Biodiversity Metric.

6.4.19 Based on the current plans for the Solar PV Site, the Scheme is predicted to result in a net gain of 36.46% for area-based habitat units, a net gain of 62.75% for hedgerow units, and a net gain of 24.97% for watercourse units (**BNG Assessment Report [EN010152/APP/7.11]).** This is likely to underestimate the actual BNG that will be achieved by the Scheme, as the assessment has been carried out based on maximum design principles, including maximum footprint of infrastructure and maximum clearance of vegetation for construction. The Applicant therefore commits to achieving a minimum 10% BNG for each unit and will demonstrate this via an updated BNG assessment prior to construction.

6.4.20 Overall, the Scheme is considered to deliver a substantial beneficial effect for biodiversity in the medium to long term (**ES Volume I Chapter 8: Ecology [EN010152/APP/6.1]).**

Mitigation and Enhancement Measures

6.4.21 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 **Framework CEMP [EN010152/APP/7.7], Framework OEMP [EN010152/APP/7.8]** and **Framework DEMP [EN010152/APP/7.9]** which have been as part of the DCO Application and will be secured as detailed plans through the DCO requirements.

6.4.22 A Biodiversity Net Gain (BNG) report has been prepared as part of the DCO Application that details the habitat creation and enhancement **[EN010152/APP/7.11].**

6.4.23 Examples of embedded mitigation for ecological features include:

a. Avoidance of protected species, such as 30m from active badger setts and 10m buffer from watercourses (where open cut is not required);

b. Undeveloped buffers will be included in the Scheme design to protect hedgerows, woodland, individual trees and ponds during construction;

c. Protected species licenses where required;

d. Soil management in line with the **Framework Soil Management Plan [EN010152/APP/7.10];**

e. Horizontal Directional Drilling (HDD) for section of the Grid Connection Corridor;

f. Standard environmental protection measures prevention of surface and ground water pollution, dust management, noise prevention and safe storage of hazardous materials;

g. Appropriate fencing to prevent impacts on fauna, including gaps to prevent habitat fragmentation;

h. Precautionary measures to prevent trapping of wildlife such as covering or fencing deeper excavations or providing a means of escape;

i. Precautionary methods of working and ecological supervision regarding vegetation clearance; and

j. Controls of lighting and illumination to minimise visual disturbance.

6.4.24 Habitat boxes will be installed on suitable features (buildings and trees) within the Solar PV Site to provided additional nesting and roosting opportunities for a range of bat and bird species, including barn owl. Information on the types of boxes that will be installed is provided in the **Framework LEMP [EN010152/APP/7.14]**.

6.4.25 A number of reptile and amphibian hibernacula/refugia will be provided utilising logs created during the removal of trees, through small bunds over logs/inert rubble, or brash piles.

Monitoring

6.4.26 Pre-construction surveys will be undertaken during the appropriate seasons prior to the construction of the Scheme. These will inform detailed design where needed, provide up to date status of protected species that require mitigation during site clearance, and inform any protected species licensing that may be required should species distribution change or detailed design result in licencing requirements for species such as bats, badger or otter, which are currently not anticipated to be necessary.

6.4.27 Ongoing monitoring of habitats and species will be undertaken throughout construction phase, overseen by an appropriately qualified person who will have the authority to review Risk Assessments and Method Statements, oversee works, and recommend action as appropriate, including temporarily stopping works where non-compliant working is observed, e.g., to safeguard protected species and their habitats, or where any other breaches of environmental legislation are likely to occur.

6.4.28 During the operational lifetime of the Scheme, habitats within the Solar PV Site will be suitably managed and monitored, in accordance with prescriptions set out within a detailed LEMP, which will be secured through a DCO Requirement and informed by the **Framework LEMP [EN010152/APP/7.14]**. Habitats will be monitored to ensure that the target conditions are being achieved. Additionally, the habitats within the Ecology Mitigation Area will also be monitored to ensure that they are continuing to meet the needs of the species that they have been created to support.

Cumulative Effects

6.4.29 Due to the proximity of other proposed developments (cumulative developments) to the Scheme, there is potential for ecological receptors (designated/non-designated sites, habitats, species), to be impacted by the Scheme and one or more other development. This is known as a cumulative effect.

6.4.30 During construction, it is reasonable to assume that these cumulative developments will provide suitable good practice measures to reduce or offset impacts experienced from proposed construction works (e.g., protection of water quality through pollution control measures, sensitive lighting, noise and dust control) through their respective CEMP.

6.4.31 A short-list of nearby proposed developments has been assessed to determine the cumulative effects with the Scheme. The temporary loss of Open Mosaic Habitat is deemed to have a ‘minor adverse’ cumulative effect with other nearby developments that also impact this habitat. All other ecological features are assessed as having a **‘negligible’** cumulative effect.

6.4.32 Whilst no public information is specifically available on some of the cumulative developments (due to no application being submitted yet), it is fair to assume that all of these developments will adhere with industry good practice guidance for mitigating loss of habitats and the requirements embedded in policy to achieve BNG.

6.4.33 The substantial benefit from BNG associated with the Scheme would likely be enhanced further by other cumulative developments achieving BNG.

6.5 Water Environment

Baseline and Context

6.5.1 **ES Volume I Chapter 9: Water Environment [EN010152/APP/6.1]** presents the findings of an assessment of the likely significant effects of the Scheme on the water environment. It also identifies and proposes measures to address the potential impacts and effects of the Scheme on surface waterbodies (e.g. rivers, streams, ditches, canals, lakes and ponds) including water quality, groundwater flow and quality, flood risk, drainage and water resources during construction, operation and maintenance, and decommissioning of the Scheme.

6.5.2 Baseline desk study and site surveys have identified a number of surface and groundwater features of importance within the 1km Study Area. The Scheme is located within the Humber River Basin Management Plan

(RBMP) area. It extends across the Don and Rother Management Catchment. All watercourses in the Study Area ultimately drain to the River Humber (Humber Upper Water Framework Directive (WFD) waterbody within the Humber TraC Management Catchment) although it is not in the Study Area itself.

6.5.3 Significant surface water features in the Study Area include the Water Framework Directive (WFD) designated River Went, River Don and Thorpe Marsh Drain. Named and unnamed drains, ditches and ponds (many being artificial) are present across the Study Area, associated with agriculture and land drainage. There are also designated habitats sites in close proximity to the Study Area including the West Ings Meadows SSSI.

6.5.4 The majority of the south and west areas of the Solar PV Site are located within Flood Zone 1, including the BESS Area and On-Site Substation. The north and east areas of the Solar PV Site are located within Flood Zone 2 and Flood Zone 3 associated with the River Went and Fleet Drain. Areas of Flood Zone 3 within the Solar PV Site are shown to be in areas where of the risk of flooding from rivers and the sea is reduced due to the presence of flood defences.

6.5.5 The Grid Connection Corridor is largely located within areas of Flood Zone 3 with smaller areas of Flood Zone 2 along its central section. Approximately 0.7km of the Grid Connection Corridor is located within Flood Zone 1 towards its northern extent.

6.5.6 The risk of surface water flooding within the Study Area is generally very low (chance of flooding of less than 1 in 1000 annual probability) for the majority of the Scheme, with areas of low (chance of flooding between 1 in 1000 annual probability and 1 in 100 annual probability), medium (chance of flooding of between 1 in 100 annual probability and 1 in 30 annual probability) and high risk (chance of flooding of greater than 1 in 30 annual probability) generally due to water flow pathways following low areas of land, including drains and agricultural ditches, where surface water sits and pools rather than draining away, or areas at risk of flooding from smaller ordinary watercourses and/or local land drains.

6.5.7 Further flood risk details are provided in **ES Volume III Appendix 9-3: Flood Risk Assessment [EN010152/APP/6.3]**.

Assessment of Effects

6.5.8 Several activities during the construction, operation and maintenance, and decommissioning phases could generate impacts, which, if unmitigated, have the potential to affect the water environment.

6.5.9 Following the implementation of embedded mitigation measures (see below), including industry good practice measures outlined in the **Framework CEMP [EN010152/APP/7.7],** the effects for surface water, groundwater, or flood risk during construction and operation and maintenance are considered **neutral** or **minor adverse,** and therefore **not significant.**

6.5.10 During the operation and maintenance phase, there is the potential for run-off from new hardstanding areas (like the BESS Area) and maintenance activities such as checking and cleaning of batteries and on-site equipment,

to cause adverse impacts on watercourses if not properly mitigated. There is the potential for a change in site runoff rates to impact hydrology (or water flow pathways), and potentially an increase in fine sediments washing into waterbodies.

6.5.11 However, to counteract these potential impacts, the Scheme would apply good industry standard practice measures and adhere with environmental legislation (see below). The Framework Drainage Strategy (**ES Volume III Appendix 9-4 [EN010152/APP/6.3]**) details the measures included within the drainage system to ensure no deleterious impact to the receiving waters – from both runoff rates, and composition. Solar PV Panels within Flood Zones 2 and 3 will be raised above modelled flood levels and the Scheme proposes further drainage works to manage any run off. These measures will ensure that there is no increase in flooding on or off-site as a result of the Scheme. The effects for surface water, groundwater, or flood risk during operation and maintenance are considered neutral or negligible, and therefore **not significant.**

6.5.12 A Water Framework Directive (WFD) Assessment has been undertaken (**ES Volume III Appendix 9-2: Water Framework Directive [EN010152/APP/6.3])** which demonstrates the Scheme will not contribute to the deterioration of water bodies. This has concluded that there would be no deterioration in the status of any WFD waterbody classification and no prevention of future improvement in status, given the mitigation built into the Scheme.

6.5.13 Potential impacts from the decommissioning phase of the Scheme are expected to be similar in nature to those during construction, as some ground works would be required to remove infrastructure. With mitigation measures in place as defined through the Decommissioning Environmental Management Plan, the effects for surface water, groundwater, or flood risk during decommissioning are also considered **not significant.**

Mitigation Measures

6.5.14 The Scheme has been designed, as far as practicable, to avoid and reduce impacts and effects on the water environment through the process of design development, and by embedding measures into the design of the Scheme.

6.5.15 The construction of the Scheme will take place in accordance with a detailed CEMP (a **Framework CEMP [EN010152/APP/7.7]** is included with the DCO Application). The CEMP will detail the measures that would be undertaken to mitigate the temporary effects of construction on the water environment. The measures within the CEMP will focus on managing the risk of pollution to surface waters and the groundwater environment.

6.5.16 Construction works undertaken adjacent to, beneath and within watercourses will comply with relevant guidance and good practice measures. This will include requirements of the Environment Agency for main rivers, and requirements of the Lead Local Flood Authority and Internal Drainage Boards for ordinary watercourses.

6.5.17 A Framework Drainage Strategy (**ES Volume III Appendix 9-4: Framework Drainage Strategy [EN010152/APP/6.3]**) has been included with the DCO Application. This describes the measures for the attenuation of surface water

runoff from the BESS Area and On-Site Substation, whilst minimising flood risk to the Solar PV Site and surrounding areas. This includes requirements and designs to contain fire suppression water, should an internal fire occur at a BESS. This water will be contained until such time as it can be tested and disposed of using a suitable Waste Contractor. **ES Volume III Appendix 9-4: Framework Drainage Strategy [EN010152/APP/6.3]** also includes the use of Sustainable Urban Drainage Systems (SuDS), which would mimic the natural drainage system as far as possible; this would be secured through a DCO Requirement. Any areas of the Solar PV Site containing oils, such as transformers, would be bunded or have self-contained drainage systems. This would ensure that any leaks are contained and do not enter the surface water drainage system. This will be developed into a detailed Drainage Strategy post consent and is a requirement of the DCO.

6.5.18 The topography of the Solar PV Site is relatively flat, and apart from where cables are to be installed across watercourses using open trench techniques and for the construction of outfalls, the construction works across the Solar PV Site are buffered from watercourses by at least 10m from the bank top.

6.5.19 Where direct works are required within a watercourse, for instance for watercourse crossings for cable installation and access tracks, suitable mitigation measures for these works are outlined in the **Framework CEMP [EN010152/APP/7.7].**

6.5.20 No new culverts are required by the Scheme. Where existing culverted crossings are used, they are assumed to require an extension of up to 2m as a worst case, but will be of an environmentally sensitive design, with a commitment to length-for-length equivalent watercourse enhancement for all culvert extensions. All new access track watercourse crossings will be of open span design.

6.5.21 Solar PV infrastructure within Flood Zones 2 and 3 will be raised above the modelled design flood level and are not expected to impact existing flood extents or mechanisms.

6.5.22 The volume of floodplain storage lost as a result of panel mounts within Flood Zone 3 and provision of compensatory storage has been assessed with the full FRA to ensure flood risk is not increased elsewhere. Floodplain storage loss has been assessed as negligible and therefore, it is not considered that any temporary floodplain compensatory storage is required. The FRA has been provided at **ES Volume III Appendix 9-3: Flood Risk Assessment [EN010152/APP/6.3]**. This has informed the Scheme design and set out any proposed mitigation requirements that are to be addressed within the Surface Water Drainage Strategy. The Grid Connection Cable is buried, therefore, there is no flood risk to, or from, the Grid Connection Corridor during the operation and maintenance phase.

6.5.23 Direct impacts to Hawkehouse Green Dike (also known as Bramwith Drain), Thorpe Marsh Drain, Moss Road and London Hill Drain, Tributary to Flashley Carr Drain, Tributary to Mill Dike, Mill Dike, Engine Dike, Wrancarr Drain and the unnamed channel south of Marsh Lane Bridge would be avoided through the use of trenchless (horizontal directional drilling) crossings. These would avoid any direct works to watercourses, with horizontal directional drilling send and receive pits set back a minimum of 10m from the banks and 16m

from the landward toe of flood defences. Potential impacts from the decommissioning phase will be managed in a similar way to those during construction. A detailed Framework Decommissioning Environmental Management Plan (DEMP) will be prepared prior to decommissioning to identify required measures to prevent pollution and flooding. A **Framework DEMP [EN/010153/APP/7.9]** is included with the DCO Application.

Cumulative Effects

6.5.24 Several other proposed developments within the same catchment as the Scheme have been considered in the cumulative assessment. For these applications, it is assumed they would follow standard good industry practice in terms of mitigation and compliance with environmental permits and licences. As such, there would be no significant cumulative effects anticipated during the construction, operation and maintenance, and decommissioning phases.

6.6 Landscape and Visual Amenity

6.6.1 **ES Volume I Chapter 10: Landscape and Visual Amenity [EN010152/APP/6.1]** presents the findings of an assessment of the potential significant effects on the existing landscape 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.

Baseline and Context

6.6.2 The Landscape and Visual Impact Assessment (LVIA) identifies the sensitivity and overall significance of landscape and visual effects within the identified Study Area. The landscape and visual baseline and assessments are based on desk-based research and field work undertaken between April 2023 and February 2024 during both Summer and Winter.

6.6.3 Landscape receptors with potential to be changed due to the Scheme are published Landscape Character Types (LCTs), published Landscape Character Areas (LCAs), and Local Landscape Character Areas (LLCAs) which were identified specifically for the LVIA. At the local level the landscape is characterised by the agricultural land use with mature hedgerows and trees dividing fields or bordering the local road network.

6.6.4 Visual receptors with potential to experience change to their visual amenity due to the Scheme are residents, people walking on the local Public Right of Way network, people travelling on the local road network, and people travelling on the East Coast Main Line.

Assessment of Effects

6.6.5 Embedded mitigation has been included in the Scheme to reduce the potential for significant landscape and visual effects. Mitigation embedded into the Scheme design can be summarised as:

a. Careful siting in the landscape;

b. Conserving existing vegetation patterns; and

c. Creating new green infrastructure.

6.6.6 Potential landscape and visual impacts, accounting for embedded mitigation, are assessed for the construction phase (Winter), operation and maintenance phase Year 1 (Winter), operation and maintenance phase Year 15 (Winter and Summer), and decommissioning phase (Winter).

Construction Phase (Winter)

6.6.7 At a national level, construction would result in **no significant** effects to the Natural England National Character Areas (NCA).

6.6.8 At the borough level, construction would physically alter the landscape of the Solar PV Site and the Grid Connection Corridor, increasing activity and causing localised alterations to the condition of the landscape across parts of Landscape Character Area (LCA) F2: Owston to Sykehouse Settled Clay Farmlands. This would result in a **moderate adverse** effect which is considered to be **significant**. These effects are only last for the duration of the construction works and are reversible.

6.6.9 At the local level, construction activity would result in a **major adverse** effect on the Local Landscape Character Area (LLCA) which makes up most of the Solar PV Site. This is considered to be **significant**. Construction would also result in **moderate adverse** effects for LLCAs located within the north of the Solar PV Site and adjacent to the Solar PV Site. This is also considered to be **significant**. The effect of construction activity on LLCAs within the wider Solar PV Site Study Area would be **minor adverse** or **no change**, which is considered to be **not significant**.

6.6.10 Construction activities are expected to result in **moderate adverse** visual effects for residential receptors in close proximity to and facing the Solar PV Site and Grid Connection Corridor. 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. These effects would only be for the duration of the construction works and would be reversible.

6.6.11 Recreational receptors using the PRoW network within the Solar PV Site would experience **major adverse** effects due to the close views of construction activity across the Solar PV Site. These effects are considered to be **significant**. For people using the PRoW network to the immediate north and south of the Solar PV Site, as well as within the Grid Connection Corridor, they are expected to experience **moderate adverse** effects during construction. These effects are considered to be **significant**.

6.6.12 Residential, recreational, road and rail receptors located within the wider Solar PV Site Study Area and Grid Connection Corridor Study Area would experience **minor, negligible** or **no change** in visual effects during construction, reducing with increasing distance from the Scheme, which are considered to be **not significant**.

Operation and Maintenance Phase (Year 1, Winter)

6.6.13 Operation and maintenance phase impacts have been assessed in both the first year of operation and maintenance during Winter (when there are no leaves on vegetation) and in Year 15 also during both Summer and Winter. Year 1 represents no growth from planted vegetation and with no leaves on deciduous vegetation, and therefore represents the worst-case, but not necessarily long-term effects.

6.6.14 The operation and maintenance of the Scheme during Winter of the first year would result in a **moderate adverse** effect for Landscape Character Area (LCA) F2: Owston to Sykehouse Settled Clay Farmlands, which is defined at the borough level. This is due to the land use change across all fields occupied by Solar PV Panels and other associated equipment within the Solar PV Site. These changes would only alter a small geography part of the LCA which covers the Solar PV Site. The Scheme would be perceived from only the immediate surroundings of the Solar PV Site as the Grid Connection Cables would be underground. This is considered to be **significant**.

6.6.15 For other LCAs or Landscape Character Types (LCT) defined at the borough level, the operation and maintenance of the Scheme at Year 1 during Winter would result in **minor adverse, negligible adverse** or **no change**, which are considered to be **not significant**.

6.6.16 At a local level, the operation and maintenance of the Scheme would result in **moderate adverse** effects for Local Landscape Character Areas (LLCA) located within the Solar PV Site, as well as some which adjoin the Solar PV Site. These are considered to be **significant**.

6.6.17 For all other LLCAs within the Solar PV Site Study Area, operation and maintenance of the Scheme at Year 1 during Winter would result in **minor adverse, negligible adverse** or **no change**, which are considered to be **not significant**.

6.6.18 Residential receptors with open views in close proximity to the Solar PV Site would typically experience **moderate adverse** visual effects at Year 1 of operation and maintenance during Winter. This is considered to be **significant**. The Scheme layout includes an offset from residential properties and proposes mitigation planting, but this would not be established at Year 1.

6.6.19 Residential receptors located further from the Solar PV Site would experience **minor adverse**, **negligible adverse** or **no change** in their view, which is considered to be **not significant**.

6.6.20 Recreational receptors walking on the Public Right of Way (PRoW) network within the Solar PV Site are expected to experience **major adverse** visual effects during operation and maintenance at Year 1. This is considered to be **significant**. For users of the PRoW network to the immediate north and south of the Solar PV Site, they are expected to experience **moderate adverse** effects, which are also considered to be **significant**.

6.6.21 Residential, recreational, road and rail receptors located within the wider Solar PV Site Study Area would experience **minor, negligible** or **no change** in visual effects during operation and maintenance at Year 1 during Winter, reducing with increasing distance from the Scheme, which are considered to be **not significant**.

Operation and Maintenance Phase (Year 15, Winter and Summer)

6.6.22 By Year 15 of operation and maintenance, planting proposed as part of the Scheme would have established, enhancing the structure of the landscape and reducing the area from which the Solar PV Site is perceptible.

6.6.23 For Landscape Character Areas (LCA) and Landscape Character Types (LCT) identified at the borough level, the operation and maintenance of the Scheme at Year 15 Winter and Summer would result in **minor adverse, negligible adverse** or **no change**, which is considered to be **not significant**.

6.6.24 At the local level, there would be a **moderate adverse** effect on the Local Landscape Character Area (LLCA) which makes up most of the Solar PV Site during both Winter and Summer. This is due to the large proportion of the LLCA which is occupied by the Solar PV Site, and the evident change in land use and character associated with this. This is considered to be **significant**.

6.6.25 For the remaining LLCAs located within the Solar PV Site, adjacent to the Solar PV Site and within the wider Solar PV Site Study Area, these are expected to experience **minor adverse**, **negligible adverse** or **no change** during both Winter and Summer, which are considered to be **not significant**. This is due to the establishment of mitigation planting, which would provide a greater sense of enclosure to the Solar PV Site.

6.6.26 The establishment of new planting would change the composition of some residential views and would screen the Solar PV Site within views at Year 15 during Winter and Summer. All visual effects for residential views would have reduced to **not significant** at Year 15 during Winter and Summer, which the exception of one property located on the periphery of the Solar PV Site. Visual effects for all other residents located within the Solar PV Site Study Area would range between **minor adverse, negligible adverse** and **no change** with increasing distance from the Solar PV Site. These are considered to be **no significant**.

6.6.27 For users of most of the Public Right of Way (PRoW) located within the Solar PV Site, they are expected to experience **major adverse** effects at Year 15 during Winter, reducing to **moderate adverse** during Summer due to vegetation being in leaf. These are both considered to be **significant**.

6.6.28 Residential, recreational, road and rail receptors located within the wider Solar PV Site Study Area would experience **minor, negligible** or **no change** in visual effects during operation and maintenance at Year 15 during both Winter and Summer, reducing with increasing distance from the Scheme, which are considered to be **not significant**.

Decommissioning Phase (Winter)

<u>District Level</u>

6.6.29 Decommissioning would result in either **minor adverse, negligible adverse** or **no change** to Landscape Character Areas (LCA) or Landscape Character Types (LCT) identified at the borough level. These are considered to be **not significant**.

6.6.30 During decommissioning, the effects on Local Landscape Character Areas (LLCA) covering the Solar PV Site would be **major adverse** or **moderate adverse**. These effects are considered to be **significant**.

6.6.31 Effects on LLCAs within the wider Solar PV Site Study Area would range between **minor adverse, negligible adverse** or **no change**. These are considered to be **not significant**.

6.6.32 Decommissioning effects on visual amenity are likely to be similar to those temporary effects experience during construction of the Scheme but reduced on account of the containment provided by landscape mitigation measures including proposed vegetation, which will have reached maturity. This would include a **moderate adverse** effect, which is considered to be **significant**, for one property located on the periphery of the Solar PV Site.

6.6.33 During decommissioning, users of most of the Public Right of Way (PRoW) network within the Solar PV Site would experience **major adverse** effects, which are considered to be **significant**. Users of the PRoW network to the immediate south of the Solar PV Site would experience **moderate adverse** effects, which are also considered to be **significant**.

6.6.34 Residential, recreational, road and rail receptors located within the wider Solar PV Site Study Area would experience **minor, negligible** or **no change** in visual effects during decommissioning, reducing with increasing distance from the Scheme, which are considered to be **not significant**.

Mitigation Measures

6.6.35 The landscape and visual impact assessment has informed the iterative design process, incorporating design principles in response to policy requirements, published landscape character assessments and fieldwork analysis. The Scheme is also designed to integrate with the local green infrastructure network, improving ecological and recreational connectivity across the Solar PV Site. This embedded mitigation has been considered throughout the assessment of effects on landscape character and visual amenity.

6.6.36 The overall objective of the landscape design is to integrate the Scheme into its landscape setting and avoid or minimise adverse landscape and visual effects as far as practicable. Accordingly, the landscape design aims to achieve the following:

a. To integrate the Scheme into the existing landscape pattern as far as practicable by retaining and following existing features, including vegetation;
b. To replace vegetation lost during construction of the Scheme through areas of new planting;
c. To filter and screen more prominent components of the Scheme in views from visual receptors; and
d. To retain and enhance existing Public Rights of Way (PRoW) through the Solar PV Site.

6.6.37 Details of the landscape measures embedded into the Scheme design, including a summary of their environmental function, is presented in the

Framework Landscape and Ecological Management Plan (FLEMP) [EN010152/APP/7.14].

Cumulative Effects

6.6.38 Cumulative effects for all identified landscape and visual receptors do not increase as a result of the introduction of the Scheme alongside the identified short list of cumulative developments. This is due to the intervening vegetation and distance between the Solar PV Site and the cumulative developments.

6.6.39 Cumulative developments tend to be in proximity to the Grid Connection Corridor. However, as construction activity would be very short-lived and Grid Connection Cables underground during operation and maintenance, there would be no significant cumulative landscape or visual effects associated with the Grid Connection Corridor.

6.7 Noise and Vibration

Baseline and Context

6.7.1 Baseline noise monitoring was carried out to establish the existing noise climate in the area. Sensitive receptors which have the potential to be affected by the Scheme were identified.

Assessment of Effects

6.7.2 The duration of any construction and decommissioning noise effects is considered to be temporary, short-term, with no permanent residual effect once works are completed. Core working hours during construction and decommissioning will be from 7am to 7pm Monday to Friday and 7am to 1pm on Saturday. The assessment considers that noise is generated throughout these periods, however it is noted that working hours will be shortened if working would necessitate artificial lighting and therefore the working day will be shorter in months with reduced daylight hours. Noise generated by typical construction and decommissioning activities during core work hours are anticipated to be **not significant**.

6.7.3 However, the installation of cabling using horizontal directional drilling to avoid surface obstacles may at times require continuous work outside the core work periods during the construction phase. Drilling activities are not predicted to exceed the noise limit during daytime, weekday evening and weekend at any receptors; however, if works cannot stop safely and are required to extend into the night, the limit may be exceeded. As drilling locations are not yet fixed, noise calculations are based on the potential closest location to a sensitive receptor that works may occur. Noise calculations indicate three sensitive receptor locations have the potential to experience significant noise effects if drilling activities extend into the night-time period: residential receptors R12 (Moss Road Receptors 2), R17 (Trumfleet Lane/Willow Bridge Lane Receptor), and R31 (Wilsic House Farm).

6.7.4 Construction and decommissioning noise levels will be controlled through implementation of the detailed CEMP and DEMP. **A Framework CEMP**

[EN010152/APP/7.7] and **Framework DEMP [EN010152/APP/7.9]** are provided as part of this DCO Application. The hierarchy of mitigation measures for drilling activities, as set out in these documents will ensure that drilling activity noise effects will be reduced as far as reasonably practicable. This hierarchy includes maximising the distance from horizontal directional drilling working areas to sensitive receptors and the use of acoustic fencing, if required. As such, it is anticipated that mitigation measures can be suitably adopted that noise effects due to drilling activities are considered to be **not significant.**

6.7.5 The distance between sensitive receptors and locations where high vibration generating construction and decommissioning activities will occur is such that construction induced vibration effects are **not significant.**

6.7.6 Noise impacts from construction and decommissioning traffic are anticipated to be negligible and **not significant.**

6.7.7 For the assessment of operational noise, the typical background noise levels at sensitive receptors have been defined from the night-time period, which provide the lowest levels and are therefore most sensitive to change. During the operation and maintenance phase, plant will operate continuously so there will not be any noticeable impulsive or intermittent characteristics from noise emissions. Predicted noise levels of operational solar plant at the nearest receptors are anticipated to be **not significant**. However, at some sensitive receptors, operational noise levels are identified as adverse (but still not significant). Consequently, all reasonable mitigation measures will be adopted to reduce operational noise at sensitive receptors. These mitigation measures will be secured in the detailed Operational Environmental Management Plan (OEMP). **A Framework OEMP [EN010152/APP/7.8]** is provided as part of this DCO Application.

Mitigation Measures

6.7.8 Embedded mitigation for construction and decommissioning includes the use of best practical means identified in the **Framework CEMP [EN010152/APP/7.7]** and the **Framework DEMP [EN010152/APP/7.9]**. such as the sequential start-up of plant and vehicles rather than all together and regular plant maintenance.

6.7.9 Appropriate routing of construction and decommissioning traffic on public roads and along access tracks is detailed in the **Framework CTMP [EN010152/APP/7.17]**.

6.7.10 Where practicable, drilling works will be avoided within 200m (the distance at which significant effects are predicted at night) of residential receptors, and where drilling activities may occur within 200m of sensitive receptors, the option for open cut cable laying will be explored as an alternative to drilling. The potential for the use of quieter equipment than listed in the ES will also be explored.

6.7.11 A construction noise monitoring scheme shall be developed alongside a communication strategy and noise complaint system. Voluntary consent under Section 61 of the Control of Pollution Act 1974 will be sought prior to noisy work required outside core work hours being carried out to

demonstrate that noise and vibration has been minimised as far as reasonably practicable.

6.7.12 During the operation and maintenance phase, embedded mitigation includes plant selection and design layout to minimise noise at receptors, with noise generating plant located at distance from sensitive receptors, such that noise emissions are less impactful. The Applicant has made a commitment that noise at sensitive receptors will be no higher than the noise levels presented in the ES.

Cumulative Effects

6.7.13 No developments identified in **ES Volume I Chapter 15: Cumulative Effects and Interactions [EN010152/APP/6.1]** are considered in combination to impact the receptors identified in this assessment. The potential for noise and vibration impacts during the construction, operation and maintenance, and decommissioning phases of the Scheme is considered within the Order limits itself. Other developments are not likely to contribute to the effects on noise and vibration receptors identified in this chapter and therefore the cumulative effects are **not significant**.

6.8 Socio-Economics and Land Use

Baseline and Context

6.8.1 **ES Volume I Chapter 12: Socio-Economics and Land Use [EN010152/APP/6.1]** presents the findings of an assessment of the likely significant effects on socio-economics as a result of the Scheme.

6.8.2 The Scheme has the potential to have a range of effects, some of which would be temporary whilst others would be permanent. Due consideration is given to the Scheme in terms of effects on the following:

a. Employment generation;

b. Impacts on local services and facilities, comprising local accommodation services;

c. Gross Value Added (GVA);

d. Public Rights of Way (PRoW);

e. Other private and community assets (comprising residential properties, community facilities including GP surgeries, local businesses, open space, visitor attractions, agricultural land holdings and development land); and

f. Best and Most Versatile (BMV) agricultural land and soils.

6.8.3 The Study Area for the Socio-economic and Land Use assessment is defined as a 60-minute travel area (drive time radius) in any direction from the Order limits when considering impacts on the economy and local accommodation services. Land use receptors are assessed if they are within the Solar PV Site or within 500m of the Order limits, apart from community facilities which are considered within 2km of the Order limits.

Existing Site and Land Use

6.8.4 The Solar PV Site is located within the area administered by City of Doncaster Council, and on the boundary of the North Yorkshire Council administrative area which is located to the north of the Solar PV Site. The Solar PV Site and the immediate adjacent area is mostly used for agricultural purposes, characterised by large-scale regular arable fields across several land-holdings.

Population and Employment

6.8.5 According to the ONS Mid-Year Population Estimates, in 2022, the resident population of the economic Study Area (the 60-minute drive time radius) was 6,312,107 in 2022, representing a 5.3% increase since 2011.

6.8.6 According to the Annual Population Survey, in 2023 the economic activity rate (amongst 16- to 64-year-olds) was 76.9% in Doncaster, lower than the rates in Selby (87.0%) and England (79.0%) and in line with the rate in the Yorkshire and the Humber (76.8%).

6.8.7 In 2023, the unemployment rate (Ref. 12-21) for working-age residents was 3.1% in Doncaster – which was slightly lower than the average rates across the Yorkshire and The Humber (3.5%) and England (3.8%). The May 2024 unemployment claimant count data was 4.5% in Doncaster, which is higher than the rates across the Yorkshire and the Humber (4.4%) and England (4.0%). The claimant count was 2.1% in Selby.

Local Economy

6.8.8 GVA per head in North Yorkshire County Council (which includes Selby) is slightly higher (£22,915) than in Doncaster (£17,404) and the wider Yorkshire and the Humber region (£21,748) but below England (£27,949).

6.8.9 The highest levels of employment in the Study Area (60 minute drive time) are recorded in Health, Manufacturing and Education.

Local Accommodation Services

6.8.10 According to the 2021 Census, there are 407,861 households in Doncaster and North Yorkshire, of which 77,105 are privately rented (accounting for 18.9% of the tenure mix). According to the latest English Housing Survey, in 2023, approximately 3.3% of the dwellings in Doncaster and North Yorkshire were vacant.

6.8.11 As of 2024, there are approximately 4,411 rooms in local hotel, bed and breakfast and inns accommodation within a 30-minute drive of the Order limits, and 40,209 rooms within a 60-minute drive time.

Public Rights of Way (PRoW)

6.8.12 There are no national trails, national cycle routes or bridleways within the Solar PV Site. The Trans Pennine Trail runs through the Grid Connection Corridor by Thorpe in Balne but will not be impacted.

6.8.13 PRoW local to the Solar PV Site are shown in **Figure 5** of this NTS. There are 12 PRoW either located entirely within the Solar PV Site, or which pass

through the Solar PV Site and continue outside of it and 22 PRoW which are located along or abutting the Solar PV Site, but which do not traverse it.

6.8.14 There are approximately 24 PRoW located within the Grid Connection Corridor Study Area. Of these, nine are within or intersect the Grid Connection Corridor.

Local Receptors

6.8.15 There are no residential properties within the Solar PV Site. The closest settlement to the Solar PV Site is Fenwick 100m to the southwest.

6.8.16 There are residential properties within 500m of the Grid Connection Corridor at Moss, Hawkehouse Green, Thorpe in Balne and Barnby Dun. The closest settlement is Moss which is approximately 130m west of the Grid Connection Corridor.

6.8.17 The Moss and Fenwick Village Hall, which also accommodates a pupil referral unit (Phoenix Education) providing alternative education services, is located adjacent to the Solar PV Site Order limits on Fenwick Common Lane.

6.8.18 There are a range of community and recreational facilities within 2km of the Scheme. Topham Ings East and West are two publicly accessible fields on the River Went, 300m northeast of the Solar PV Site, which are owned and managed by the Burnet Heritage Trust and which provide a bird hide. There are no police stations, fire stations or hospitals, within 2km of the Order limits.

6.8.19 There are multiple agricultural land holdings and the Existing National Grid Thorpe Marsh Substation located within the Order limits. There are approximately 16 businesses within 500m of the Order limits.

6.8.20 There are no visitor attractions within 500m of the Order limits.

6.8.21 There are no allocated development sites, or sites subject to planning applications or permissions within the Solar PV Site. Three planning applications have been identified within the Grid Connection Corridor Study Area.

6.8.22 The Grid Connection Cables within the Grid Connection Corridor would enter a Minerals Safeguarding Area (MSA) for sand and gravel (Land to the east of Doncaster between Thorne and Bawtry) near Trumfleet Grange and travel southward to Thorpe in Balne.

BMV Agricultural Land

6.8.23 The mapping of agricultural land and soils within the Solar PV Site has been based on site surveys undertaken between February and May 2023, with additional areas surveyed during June 2024. The surveys covered 403.7 ha of land, and the results presented below relate to that area.

6.8.24 Approximately 7% of land surveyed within the Solar PV Site is classified as BMV land, 6% of which is subgrade 3a and 1% is Grade 2. The Solar PV Site is predominantly located in ALC Grade 3b land (87%) (non-BMV land) and the remaining land comprises Grade 4 (3%) ALC and non-agricultural land (3%).

6.8.25 The mapping of agricultural land and soils within the Grid Connection Corridor has been based on the Defra Natural England Provisional ALC dataset. The Grid Connection Corridor is predominantly located in ALC Grade 4 (poor quality agricultural land) with some in Grade 3 (good to moderate quality agricultural land).

Assessment of Effects

Construction

6.8.26 The estimated construction phase is expected to 12 months for the Grid Connection Corridor and 24 months for the Solar PV Site. Therefore, likely effects will be of a medium-term temporary nature. Although construction jobs are temporary, they represent a positive economic effect for a substantial period.

6.8.27 It is estimated that the Scheme will require a peak workforce of 250 full-time equivalent (FTE) staff per day, and create an average of 200 gross FTE jobs on-site per day during the construction phase (assumed to be equivalent to 200 FTE jobs per annum). Of these construction jobs, 45% are expected to be taken up by people living within 60 minutes travel time of the Solar PV Site.

6.8.28 Taking this into account, the impact of construction employment generation in the Study Area has been assessed to be a short-term temporary **minor beneficial effect**. This is considered to be **not significant.** The **Framework Skills Employment and Supply Chain Plan [EN010152/APP/7.15**] sets out a variety of interventions which the Applicant proposes to pursue post-consent to maximise the economic benefits of the scheme, for example promoting local employment, apprenticeships and education.

6.8.29 Analysis of the hotel, bed and breakfast and inns accommodation sector has been undertaken to assess the likely capacity against the demand from the potential peak construction workforce. It indicates, considering existing seasonal demand and typical occupancy, that capacity is sufficient, and the workforce can be accommodated within existing provision within a 30-minute drive time radius of the Solar PV Site. Given this, there would be no effect on the hotel, bed and breakfast, and inns accommodation sector arising from the Scheme.

6.8.30 The impact of direct GVA generation from the construction phase on the economy within the Study Area has been assessed as a temporary minor beneficial effect on both a local and regional scale. This is considered **not significant.**

6.8.31 Changes to journey times, local travel patterns, and certainty of routes for users could arise from any diversions or impacts on PRoW. However, the Scheme has been designed to have minimal-to-no impact on PRoW.

6.8.32 Three PRoW would be temporarily diverted during construction: PRoW Fenwick 16, Moss 6 and Fenwick 14. Based on the length of the required diversions, the magnitude of impact is assessed to be very low, which would result in a negligible effect. This is considered **not significant.**

6.8.33 Some of the PRoW crossed by the Grid Connection Corridor would be impacted during the short-term trenching and restoration operations. It is proposed to temporarily (and locally) divert these around each works area, for approximately 2–3 weeks each, when the cables are installed. This would result in a negligible effect. This is considered **not significant.**

6.8.34 Three PRoW would be permanently diverted during construction, including Moss 6, Fenwick 14, and Sykehouse 29. In each case, the permanent diversion would result in a negligible effect. This is **considered not significant.**

6.8.35 No permanent diversions are anticipated along the Grid Connection, Site Accesses and Ecology Mitigation Area.

6.8.36 No direct land use impacts on residential properties, businesses, community facilities, open spaces or visitor attractions are anticipated. Activities related to the construction of the Scheme, for example increases in construction traffic, may restrict, or create severance to, the accessibility of residential properties, business premises, community facilities, open space, visitor attractions, healthcare infrastructure and agricultural land holdings and development land for residents in the Study Area. However, only a minor adverse effect is anticipated in this regard, which is considered **not significant.**

6.8.37 The Scheme would require land take from agricultural land both temporarily and, in some very limited circumstances, permanently. Under the Solar PV Panels, land will be planted up as grassland or native scrub and within the ecological mitigation area the existing riparian mosaic will be conserved and enhanced. This temporary planting applies to 363.15 ha of the Solar PV Site. There will be some temporary land take within the Solar PV Site associated with the BESS Containers (4.52 ha), access tracks (5.31 ha), field stations (1.08 ha) and the Operations and Maintenance Hub (0.12 ha); this infrastructure would be removed after operation.

6.8.38 As outlined above, DEFRA predictive mapping indicates that 17.9 ha (17.8%) of land within the Grid Connection Corridor is Grade 3, while 82.9 ha (82.2%) is Grade 4. Disturbance arising while the cable is installed via a shallow and narrow trench and the land is restored would be short term, as land could return to agricultural use once construction was complete.

6.8.39 Permanent land take will be required within the Solar PV Site for the construction of the On-Site Substation (1.99 ha); however the ALC survey identified this land as Grade 3b (not BMV land). Permanent land take will also be required for structural planting (7.54 ha); of this, 59.5 sqm will be Grade 2 and 7,740.9 sqm will be Grade 3a. Therefore, less than 1 ha of permanent land take (7,800.5 sq m) will be BMV land. The magnitude of impact is thus assessed to be very low, and the effect of the Scheme on the use of BMV agricultural land is assessed to be negligible, which is **not significant.**

6.8.40 Construction of the Grid Connection Cables would require limited temporary land take from extraction areas within the Mineral Safeguarding Area for sand (MSA) and gravel (Land to the east of Doncaster between Thorne and Bawtry). It is considered that cabling works can take place without preventing the economically viable mineral resource (if present) to be

extracted in the future. Therefore, the effect is assessed to be minor adverse, which is considered **not significant.**

Operation

6.8.41 The jobs created by the operation and maintenance phase of the Scheme would offset the agricultural jobs lost as a result of the Scheme. Therefore, it has been assessed that there will be **no effect** on employment during the operation of the Scheme.

6.8.42 The temporary diversion of PRoW Fenwick 16 footpath would be reinstated to the original route during the operation and maintenance phase. The permanent diversion of PRoW Sykehouse 29, Moss 6, and Fenwick 14 footpath would remain during the operation and maintenance phase. Therefore, there would be a negligible effect on users of PRoW arising from the Scheme, which is considered **not significant.**

6.8.43 Operational traffic is anticipated to be very low and therefore it is not anticipated that there would be any adverse impacts on community connectivity due to traffic generation during the operation and maintenance phase. It is assessed that there would be **no effect** on private and community assets, including development land, during the operation and maintenance phase of the Scheme.

6.8.44 Similarly, the levels of operational traffic would not impact on local residents' ability to access healthcare facilities. It is assessed that there would be a negligible effect on healthcare infrastructure which is considered **not significant.**

6.8.45 The agricultural land located within the Solar PV Site which is required for the duration of the Scheme will be unavailable for farming activities, although there is potential for grazing by sheep for management of the grassland. Given that only a small proportion of the agricultural land is BMV land (only 7% of the Solar PV Site), the loss of the BMV agricultural land is temporary and reversible, and it is likely that soil function would improve during the operation and maintenance phase due to the removal of tillage leading to soil structural improvement and increased carbon sequestration, the effect is assessed as negligible. This is considered **not significant.** It is anticipated that there would be no effect on development land during the operation and maintenance phase. To minimise any potential hindrances or adverse impacts on other proposed developments which overlap geographically with the Scheme, the Applicant will engage with scheme promoters and operators if and as required, in the framework of the consenting process. Also, there are unlikely to be connectivity impacts given the low levels of traffic generation anticipated.

6.8.46 With regard to the MSA extraction areas which overlap with the Grid Connection Corridor, during the operation and maintenance phase of the Scheme, it is considered that non-mineral development can potentially take place without preventing the economically viable mineral resource (if present) to be extracted in the future. Therefore, the effect is assessed to be minor adverse, which is considered **not significant.**

Decommissioning

6.8.47 The impact of decommissioning employment generation in the Study Area has been assessed to be **minor beneficial effect**, which is considered to be **not significant.**

6.8.48 The impact of decommissioning on PRoW is assessed to be negligible which is considered **not significant.** No direct land use impacts on residential properties, businesses, community facilities, healthcare infrastructure, open spaces or visitor attractions are anticipated. Based on anticipated levels of traffic generation, only a minor adverse effect is anticipated with regard to severance of land use receptors, which is considered **not significant.**

6.8.49 There would only be a short time frame of any disruption to farming activities during decommissioning activities and the Solar PV Site would be returned to landowners in the condition as at the end of the operation and maintenance phase including seeded and grassed land following completion of the decommissioning. Therefore, the effect is assessed to be negligible which is considered **not significant.**

6.8.50 The effect on development land and the MSA during decommissioning are assessed to be minor adverse, which is considered **not significant.**

Mitigation Measures

6.8.51 Mitigation measures are embedded within the Scheme to reduce construction and operational effects relating to transport, which in turn will mitigate the effects on the local community and existing facilities from a Socio-Economic and Land Use perspective. The relevant mitigation measures are set out in the Section 6.9: Transport and Access of this NTS. No additional mitigation measures are required, due to no significant adverse effects associated with Socio-Economics and Land Use being identified.

6.8.52 The Scheme has been designed to take into account the quality of agricultural land such as positioning the permanent infrastructure to avoid BMV land as far as practicable, and avoiding other socio-economic and other sensitive environmental receptors, where practicable.

6.8.53 Within the Solar PV Site, PRoW will be buffered from the perimeter fencing, with fencing being installed a minimum distance of 20m either side of the centre of the PRoW where solar infrastructure lies to both sides (creating a 40m wide corridor between the fence lines), or 15m if solar infrastructure is to one side only (30m for BESS).

6.8.54 During the construction phase, temporary diversions will be put in place for three PRoW (Fenwick 16, Moss 6 and Fenwick 14). There will also be temporary local diversion of PRoW crossed by Grid Connection Corridor during works (lasting approximately 2-3 weeks). Three PRoW will also be permanently diverted (Sykehouse 29, Moss 6 and Fenwick 14). Further detail on embedded mitigation and management measures to minimise impacts on PRoW is set out in the **Framework Public Right of Way Management Plan [EN010152/APP/7.13]**.

Cumulative Effects

6.8.55 The effects of the Scheme are not expected to change when considered alongside other projects in the vicinity. Some of the beneficial effects may be intensified, such as employment and spending, but not to a level where it would obviously increase the significance of the beneficial effect. The residual effects conclusions therefore remain valid and unchanged when also considering these other nearby schemes.

6.9 Transport and Access

Baseline and Context

6.9.1 **ES Volume I Chapter 13: Transport and Access [EN010152/APP/6.1]** presents the findings of an assessment of the likely significant effects on transport and access as a result of the Scheme during construction, operation and maintenance phase, and decommissioning.

6.9.2 The key roads described below are shown in **Figure 6.**

Strategic Highway Network

6.9.3 The M62 is a dual carriageway road that has three lanes heading in each direction with hard shoulder separation and connects Liverpool to Hull via Bradford. The road is managed by National Highways and provides a link for onward strategic journeys in all directions. The M62 Junction 34 is the closest Junction to the Solar PV Site.

6.9.4 The M18 is also located to the east of the Scheme which runs from Junction 35 of the M62 towards Doncaster towards the east of Sheffield in a southerly direction. The M18 is characterised by two lanes between the M18 Junction 5 and Junction 2 with three lanes on the remainder of the M18.

Local Highway Network

6.9.5 The A19 runs for about 18km from the M62 Junction 34 to St Mary's Roundabout in Doncaster, passing through areas like Whitley and Askern. It has a single carriageway with speed limits varying from 30 to 60 mph. Moss Road, connecting to the A19, runs through Askern and Moss, with speed limits changing from 30 to 50 mph. Fenwick Common Lane, a single-lane road, connects Moss Road to Fenwick and will be used by construction staff for access. It is proposed that Fenwick Common Lane will provide access for a proportion of inbound construction staff only. Other construction and staff vehicles will use the main access off Moss Road.

6.9.6 Approximately 1km along Fenwick Common Lane, Haggs Lane forms a stopped-up priority junction that is currently not available for vehicular use, however as part of the Scheme this junction will be altered to allow vehicular access. A PRoW (namely Footpath Fenwick-16) exists on the northern side of the existing track and separation between vehicles and the PRoW will be managed through the measures described in the **Framework PRoW Management Plan (PRoW MP) [EN010152/APP/7.13]** and secured within the detailed Framework CTMP as part of a DCO Requirement.

6.9.7 Main operational access to the Solar PV Site will be via Lawn Lane.

Walking and Cycling

6.9.8 The Scheme is in a rural area with mostly country lanes and few pedestrian or cycle facilities, except in villages such as Askern. Fenwick Common Lane and Moss Road lack footways, making walking to the Solar PV Site difficult. There are no specific cycle lanes nearby, and the closest National Cycle Network route is 4km away from the Solar PV Site, although it does run through the Grid Connection Corridor. As described in Section 4.1, There is an extensive network of PRoW both within the Order limits and across the surrounding area shown on **Figure 5.** The assessment of PRoW is discussed in 6.8. A **Framework PRoW MP [EN010152/APP/7.13]** has been produced as part of the DCO Application to establish any potential impacts on these PRoW and how these will be mitigated. Local roads are also used by equestrians, which will be managed through the **Framework CTMP [EN010152/APP/7.17].**

Public Transport

6.9.9 The area around the Scheme is mostly rural with limited public transport. The nearest bus route (51 Doncaster to Norton) is 4.3km away and not practical for workers. Moss Road and Fenwick have bus services, however, these are designated as being school buses and run only twice a day. Due to the distance, lack of safe footways, and limited services, public transport isn't a viable option for workers. The closest train stations are Adwick (10 km), Hatfield and Stainforth (10.6 km), and Thorne North (14.7 km), making train travel impractical for accessing the Scheme.

Assessment of Effects

Construction

6.9.10 The assessment shows that following the implementation of embedded mitigation, the construction phase impacts (in terms of construction traffic increase, severance of communities, Non-Motorised Users (NMU) amenity (i.e., pedestrians, cyclists and equestrians), fear and intimidation, and road vehicle driver and passenger delay) are considered to be moderate adverse within at least one of the assessment criteria at the following locations:

a. Link 9: Moss Road – Askern Village;
b. Link 10: Moss Road – East of Askern;
c. Link 11: Fenwick Common Lane
d. Link 12: Trumfleet Lane – South of Moss
e. Link 13: Marsh Road; and
f. Link 14: Thorpe Bank.

6.9.11 It has therefore been identified that with embedded mitigation measures in place, there could still be **potentially significant effects at links 9, 10, 11, 12, 13 and 14**. These significant effects are generally because there are currently low numbers of traffic movements experienced at these links, such that the relatively low number of additional traffic movements as a consequence of the Scheme result in high percentage increases in traffic.

6.9.12 All other sites assessed were determined to have **no significant effects** in terms of construction traffic increase, severance of communities, NMU amenity, fear and intimidation, road vehicle driver and passenger delay and road user and pedestrian safety.

Operation

6.9.13 The operation and maintenance phase anticipated to create much less traffic than construction or decommissioning. Only a few vehicle movements a day are anticipated.

6.9.14 Therefore, as predicted traffic levels owing to the operation and maintenance phase are low, operational effects are therefore expected to be negligible, with no significant effects.

Decommissioning

6.9.15 As the decommissioning phase is planned to commence 40 years after final commissioning (e.g. making it very difficult to predict traffic background conditions that far into the future) and expected to result in less traffic than the construction phase (and over a shorter period), decommissioning is expected to lead to effects that are no worse than during construction. The decommissioning phase has therefore not been specifically modelled and the effects and mitigation for construction are considered applicable for decommissioning and represent a worst case scenario.

Mitigation Measures

Construction and Decommissioning

6.9.16 Embedded mitigation measures have been included in the Scheme through the provision of a CTMP, to be secured through the DCO, a framework version of which is provided in the **Framework CTMP [EN010152/APP/7.17]**. This mitigation to minimise construction and decommissioning impacts includes:

a. Suitable access points identified to enable movement of vehicles into sites where appropriate;

b. All access points that require the creation of a junction bellmouth would be designed based on the relevant standard from the Design Manual for Roads and Bridges (DMRB) and in consultation with the local highway authority, thereby negating any potential safety impact associated with construction activity.

c. Swept path analysis, which checks if vehicles can navigate safely through roads without collisions, for AILs, HGVs, and tractor/trailers has been conducted to ensure there is knowledge of where routing is appropriate.

d. HGVs and AILs will be routed in accordance with the findings of the routing review for large vehicles as set out in the **Framework CTMP [EN010152/APP/7.17].** There are expected to be 10 two-way AIL movements associated with the delivery of transformers to the On-Site Substation;

e. Utilising internal routes within the Solar PV Site to avoid using the existing road network where practicable;

f. Managing the areas where traffic may have to use the road network, by providing adequate visibility splays between construction vehicles and other 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 will also apply where construction traffic and PRoW may intersect;

g. Restricting HGV movements via Moss Road – SRN, A19;

h. Route a proportion of inbound staff vehicles via Fenwick Common Lane/Haggs Lane to reduce traffic through Moss during the morning peak;

i. Restricting HGV movements to ensure arrivals/ departures between 09:00 and 17:00 to avoid increasing traffic levels on the surrounding highway network during the traditional weekday peak hours;

j. Implementing a Delivery Management System to control the bookings of HGV deliveries from the start of the construction phase. This will be used to regulate the arrival times of HGVs via timed delivery slots, as well as to monitor compliance of HGV routing. In addition, adequate space will be made available within the Solar PV Site to ensure no queuing back onto the surrounding road network occurs;

k. Implementing a monitoring system to record the route of all HGVs travelling to and from the Scheme, to record any non-compliance with the agreed routing strategy/ delivery hours and to communicate any issues to the relevant suppliers to ensure the correct routes and times are followed;

l. Directing workers and construction staff (e.g. non-HGV vehicles) to take the most direct route to the Scheme using ‘higher’ order roads, such as A and B classified roads or the SRN;

m. Encouraging local construction workers to car share to reduce single occupancy car trips. A car share system will be implemented to match potential sharers and to help staff identify any colleagues who could potentially be collected along their route to/ from the Scheme. In addition a a shuttlebus service will transfer non-local workers to/ from local worker accommodation or pick-up locations (assumed minibus capacity of 25);

n. Providing on-site car and cycle parking to accommodate the expected parking demand of workers for the Scheme; and

o. A specialised haulage service will be employed to allow AILs 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.

Operation

6.9.17 Embedded mitigation measures during the operational phase will be delivered through a Framework Operational Environmental Management Plan (OEMP), to be secured through the DCO. A **Framework OEMP [EN010152/APP/7.8]** is submitted as part of this DCO application. This mitigation to minimise operational impacts includes:

a. Operational staff will be encouraged to take the most direct route to the Scheme using 'higher' order roads, such as A and B classified roads or the SRN;

b. HGV movements are anticipated to be low across the 40-year operation and maintenance phase, but when required HGV movements will be restricted to certain times of day (between 09:00 and 17:00) and restricted to the SRN and other "higher" order roads where applicable (M62, M18, M180, A19);

c. Ensuring operational staff park within the Solar PV Sites during operation as to limit impact on parking available within the local road network; and

d. Providing sufficient protection/separation between existing PRoW and the Scheme infrastructure (Solar PV Panels, BESS Area and the On-Site Substation) where necessary using perimeter fencing installed at a minimum distance of 20m on either side of the centre of the PRoW where solar infrastructure lies to both sides or 15m if solar infrastructure is to one side only;

e. Main operational access to the Solar PV Site will be via Lawn Lane; and

f. Emergency access to the BESS Area and the On-Site Substation will be provided via Fenwick Common Lane/Haggs Lane and from Moss Road.

Cumulative Effects

6.9.18 It is considered that there are unlikely to be significant effects arising from cumulative development during the construction phase, due to limited overlap of Study Areas and limited levels of traffic being generated by cumulative sites.

Other Environmental Topics

6.9.19 **ES Volume I Chapter 14: Other Environmental Topics [EN010152/APP/6.1]** presents the findings of the preliminary impact assessment on the following topics which are covered in the sections below:

a. Air Quality;

b. Glint and Glare;

c. Ground Conditions;

d. Major Accidents or Disasters;

e. Telecommunications, Television Reception and Utilities;

f. Materials and Waste; and

g. Electromagnetic Fields.

6.10 Air Quality

6.10.1 This section considers the potential for activities to change local air quality during the construction, operation and maintenance, and decommissioning phases of the Scheme. The guidance and methods that have been used are widely applied in England to assess the likelihood of emissions to air affecting the health and amenity of the local community or conditions at designated ecological sites.

6.10.2 The current standard of air quality experienced by communities surrounding the site for the Scheme is very good. The concentrations of nitrogen dioxide and particulate matter are less than half the national air quality objective values set for the protection of human health. Baseline rates of dust deposition are typical of rural areas with agricultural practices being the main sources of material deposited locally.

6.10.3 The assessment adopts good site practices to minimise the potential for emission to occurring from works (such as earthworks and construction activities) or exhaust emissions from road going vehicles or construction plant (such as excavators or generators). The good site practice measures will be implemented through the detailed CEMP and DEMP, secured through the requirements of the DCO. A **Framework CEMP [EN010152/APP/7.7])** and **Framework DEMP [EN010152/APP/7.9]** are included as part of the DCO Application. These measures have a strong track record of controlling offsite effects of emissions to air effectively, where they have been applied to other construction sites over the last 20 years.

6.10.4 The nature of the activities required to construct, operate and decommission the Scheme have limited potential to generate emissions to air and with the proposed good practice control measures there should be no change to future standard of air quality experienced by local communities, with or without the Scheme. The measures set out in the detailed CEMP and DEMP will require additional effort to be made to control emissions proactively, for example in response to visual inspections by the site manager.

6.10.5 Including embedded mitigation, the likely effects of the Scheme on local air quality and public amenity are assessed to be negligible and therefore not significant.

6.10.6 With the proposed controls measures for the Scheme and each cumulative development, the likely cumulative effects at air quality receptors are assessed not to be significant.

6.11 Glint and Glare

6.11.1 Glint and Glare are essentially the unwanted reflection of sunlight from reflective surfaces. ‘Glint’ refers to a momentary flash of light and ‘Glare’ refers to a continuous source of bright light. The full study on glint and glare is available in **ES Volume III Appendix 14-2: Glint and Glare Assessment [EN010152/APP/6.3]**. Several potential receptors are present in the vicinity of the Solar PV Site. These include residents, road vehicles, users of

bridleways, railway users and aircraft. Impacts to the users of the local waterways were also considered but not subject to modelling.

6.11.2 A 1km Study Area around the extent of the Solar PV Site was considered for the assessment of ground-based (residential, road, rail and bridleway) receptors, whilst a 30km Study Area was defined for aviation receptors.

6.11.3 Detailed modelling (Geometric analysis) was conducted at 124 individual residential receptors, including 12 residential areas, 68 road receptors, 21 rail receptors and four bridleway receptors. In addition, geometric analysis was conducted at 16 runway approach paths and one Air Traffic Control Towers (ATCT) at Doncaster Sheffield Airport, Sherburn-in-Elmet Airport, Church Farm and Bridge Cottage Airfield.

6.11.4 The modelled impact at each receptor does not take consideration of local vegetation or other obstacles and assumes no cloud at any point in the year. It is therefore a conservative and precautionary assessment, likely to overestimate the actual impacts associated with the Solar PV Site.

6.11.5 The assessment concludes that:

a. Solar reflections are possible at 52 of the 124 residential receptors assessed within the 1km Study Area. Upon reviewing the actual visibility (that is, with shielding from existing buildings, vegetation and other obstacles in place) glint and glare impacts were identified as **Low** at three receptors and to **None** at all remaining receptors. Once mitigation measures were considered, impacts reduce to **None** at all receptors.

b. Solar reflections are possible at 59 of the 68 road receptors assessed within the 1km Study Area. Once reviewing the actual visibility of the receptors, glint and glare impacts reduce to **None** for all road receptors. Therefore, overall impacts are considered to be **None**.

c. Solar reflections are possible at 14 of the 21 rail receptors assessed within the 1km Study Area. Once reviewing the actual visibility of the receptors, glint and glare impacts reduce to **None** for all rail receptors. Therefore, overall impacts on rail receptors are considered to be **None**.

d. Solar reflections are possible at one of the four bridleway receptors assessed within the 1km Study Area. Once reviewing the actual visibility of the receptors, glint and glare impacts reduce to **None** for all bridleway receptors. Therefore, overall impacts on bridleway receptors are considered to be **None**.

e. 16 runway approach paths and two ATCTs were assessed in detailed at Doncaster Sheffield Airport, Sherburn-in-Elmet Airport, Church Farm and Bridge Cottage Airfield. Green glare (low potential for after-image) and yellow glare (potential for after-image) impacts were predicted for Runway 08 at Church Farm Airfield. Green glare is an acceptable impact upon runways according to FAA guidance. Upon inspection of the type of aircraft using Church Farm, time of impact, position of the sun and use of existing pilot mitigation strategies when landing in the direction of the sun, as well as the likely landing direction for the runway and Google Earth aerial imagery indicating the airfield is not in use, all

impacts at Church Farm can be deemed **acceptable**. Overall impacts on aviation assets are acceptable and **not significant**.

f. Navigable waterways are outside of the 1km Study Area and therefore detailed modelling to assess the impacts on boat users was not undertaken. However, following detailed modelling and implementation of mitigation, the impacts upon ground-based receptors (road, rail, residential and bridleway) in much closer proximity to the Solar PV Site (within the 1km Study Area) than the rivers are None. Therefore, as the navigable waterways are located further than 1km away from the Solar PV Site, impacts are assumed to be none.

6.11.6 The effects are considered to be **none (not significant),** except for overall aviation impacts which are **low and not significant**.

6.11.7 **Low** and **No Impacts** were found for aviation and ground-based (residential, road, rail and bridleway) receptors respectively, and therefore no additional mitigation measures are required to reduce glint and glare impacts. However, a conservative approach to mitigation has been applied to bring Low impacts down for three residential receptors (74, 79 and 88). This includes native hedgerows to be planted/infilled and maintained to a height of at least 3.5m along the southern boundary of the Central Array and along a southwest section and a southern section of the South Array.

6.11.8 There are no other solar developments located/proposed to be located within 2km of the Solar PV Site to cause any potential cumulative effects. Therefore, no cumulative effects are predicted.

6.12 Ground Conditions

6.12.1 Two Phase 1 Preliminary Risk Assessment (PRA) reports (**ES Volume III Appendix 14-3: Phase 1 Preliminary Risk Assessment – Solar PV Site and ES Volume III Appendix 14-4: Phase 1 Preliminary Risk Assessment – Grid Connection Corridor**) identify and evaluate potential land quality risks and development constraints associated with the Scheme.

6.12.2 Risks to human health, controlled waters and other sensitive receptors have been identified as between very low to low within the Phase 1 PRA reports.

6.12.3 After good practice industry mitigation, which has been incorporated into the environmental management plans, the Scheme is not considered to pose an unacceptable risk to human health or the environment either during construction, during operation and maintenance phase or decommissioning. There is not expected to be any likely significant effects associated with Ground Conditions.

6.12.4 A number of embedded environmental design and management measures will be employed as standard good practice to minimise impacts to both human health and controlled waters during the construction, operation and maintenance, and decommissioning phases of the Scheme. These are described in the **Framework CEMP [EN010152/APP/7.7], Framework OEMP [EN010152/APP/7.8]** and **Framework DEMP [EN010152/APP/7.9]** included as part of this DCO Application. These include measures to prevent surface runoff, discharge into watercourses and dust generation. The residual effects are therefore considered to be negligible and not significant.

6.12.5 Some intrusive geotechnical site investigation will be undertaken post-consent to inform engineering design, for instance at horizontal directional drilling locations. A Generic Quantitative Risk Assessment (GQRA) will be undertaken post-consent in the areas of potential contamination identified in the Phase 1 PRA reports and appropriate mitigation/remediation measures identified. Mitigation will also include measures for the identification and remediation of any 'unexpected' contaminated ground not identified through the GQRA (including isolated 'hotspots' of contamination and/or potential deposits of asbestos containing materials), to protect workers, site users, water resources, structures, and services.

6.12.6 There are several cumulative developments in the vicinity (within a 1km buffer) of the Scheme which have the potential to result in cumulative ground contamination effects, as they will result in some degree of excavation or ground disturbance. Provided that the requirements of relevant policy and legislation relating to land contamination and remediation are integrated within the design and appropriate mitigation measures are applied during the demolition and construction phases of each development, impacts to Ground Conditions will be controlled, and it is considered that the cumulative effect on ground conditions will be negligible and not significant.

6.13 Major Accidents and Disasters

6.13.1 This section provides a description of the potential effects of the Scheme on the environment deriving from the vulnerability of the development to risks of major accidents and/or disasters which are relevant to the Scheme. "Accidents" are an occurrence resulting from uncontrolled developments in the course of construction, operation and maintenance phase, and decommissioning (e.g. a major emission, fire or explosion). "Disasters" are naturally occurring extreme weather events or ground related hazard events (e.g. subsidence, landslide, earthquake).

6.13.2 An exercise was undertaken to identify all possible major accidents or disasters that could be relevant to the Scheme, including floods, fire, road accidents, utilities failure and plant disease. Major accidents or disasters with little relevance in the UK, such as volcanic eruptions, were not included.

6.13.3 By their very nature, major accidents and disasters have the potential to lead to moderate or major adverse effects, irrespective of the Scheme. Therefore, the focus is on prevention and response planning to reduce any additional risk or effect of this happening which may arise as a result of the Scheme. This exercise concluded that there is **no significant risk** of major accidents and disasters occurring during construction, operation and maintenance phase or decommissioning as a result of the Scheme.

6.13.4 With the mitigation measures listed in ES Volume I Chapter 14: Other Environmental Topics (MAD) [EN010152/APP/6.1] including the implementation of the **Framework CEMP [EN010152/APP/7.7], Framework OEMP [EN010152/APP/7.8]** and **Framework Battery Safety Management Plan [EN010152/APP/7.16]** to reduce the risk of fire and other shortlisted events for the Scheme, it is not expected that any cumulative developments would increase the risk or severity of the residual effects associated with major accidents and disasters affecting the Scheme.

6.14 Telecommunications and Utilities

6.14.1 Existing infrastructure constraints identified at and adjacent to the Order limits include the Existing National Grid Thorpe Marsh Substation, overhead lines and towers, private water supply abstraction boreholes and live water mains.

6.14.2 The Scheme is unlikely to interfere with telecommunications infrastructure due to the relatively low height of the Solar PV Panels and infrastructure, which will not provide an obstacle for telecommunication waves. Therefore, it is assessed that there will be no significant effects on telecommunication during the construction, operation and maintenance, and decommissioning phases of the Scheme.

6.14.3 Similarly, as the Scheme consists of fixed low-lying infrastructure, it is unlikely to interfere with digital television signals and therefore it is assessed that there will be no significant effects on digital television signals during the construction, operation and decommissioning phases of the Scheme.

6.14.4 The potential exists for utilities to be affected during the construction of the Scheme through inadvertent damage caused as a result of excavation and engineering operations.

6.14.5 Potential impacts on utilities will be addressed through a number of embedded mitigation measures included in the **Framework CEMP [EN010152/APP/7.7]** and the **Framework DEMP [EN010152/APP/7.9]** such as locating the Scheme outside of utilities protected zones, using ground penetrating radar before excavation to identify any unknown utilities, and ensuring adequate clearances are in place when plant and equipment is being moved beneath the overhead lines. With embedded mitigation in place, it is not expected that there will be any significant adverse effects. The application of embedded mitigation would reduce the likelihood of effects on utilities during construction. Therefore, no significant adverse effects are expected during construction. Additionally, the embedded mitigation measures used during construction would also apply during decommissioning. Therefore, no significant adverse effects are predicted during decommissioning.

6.14.6 No effects on utilities are predicted as a result of the operation and maintenance phase of the Scheme because no below-ground works will be required during operation and maintenance , and embedded mitigation measures included in the **Framework OEMP [EN010152/APP/7.8]** in relation to safe working beneath overhead lines will be in place. In the unlikely event that maintenance works (for example to repair a cable) require excavation near to below ground utilities infrastructure, appropriate mitigation measures will be in place, as for construction.

6.14.7 It is expected that the other developments included within the cumulative developments shortlist would also have no effect on Telecommunications, Television Reception and Utilities and would adhere to the same mitigation as set out in **ES Volume I Chapter 14: Other Environmental Topics (Telecommunications, Television Reception and Utilities) [EN010152/APP/6.1]**. Therefore, no cumulative effects are expected on Telecommunications, Television Reception and Utilities.

6.15 Electric and Electromagnetic Fields

6.15.1 This section summarises the effects of the Scheme on Electric and Electro-magnetic Fields.

6.15.2 Electric fields are the result of voltages applied to electrical conductors and equipment. Fences, shrubs, and buildings easily block electric fields. Electromagnetic fields are produced by the flow of electric current; however, unlike electric fields, most materials do not readily block electromagnetic fields. The intensity of both electric fields and electromagnetic fields diminishes with increasing distance from the source.

6.15.3 With the exception of relatively short lengths of On-Site Cables and the Grid Connection Line Drop option, all cables would be buried underground. Underground cables eliminate the electric field altogether as it is screened out by the sheath around the cable, and therefore the assessment only considers electro-magnetic fields.

6.15.4 There are two options for connection to the Existing National Grid Thorpe Marsh Substation currently under consideration that may involve above-ground infrastructure with the potential to have EMF effects. The arrangement of the grid connection will be determined after the DCO is submitted. However, for the purpose of this assessment and as detailed in **ES Volume I, Chapter 2: The Scheme [EN010152/APP/6.1]** the options being considered are:

a. The installation of 400 kV and associated cables in the Grid Connection Corridor, connecting the On-Site Substation to the Existing National Grid Thorpe Marsh Substation; and

b. 400 kV Grid Connection Line Drop to connect the On-Site Substation to the existing overhead power lines within the Solar PV Site. This option would comprise of below ground cables connecting the On-Site Substation to a new cable sealing end compound at the base of an existing on-site 400 kV overhead line tower.

6.15.5 All works to establish the cable sealing end compound and works within the cable sealing end compound to modify the tower and connect the Scheme's cables to the NETS would remain under National Grid's control. The timing of these works may coincide with the timing of the cable laying in the Grid Connection Corridor and therefore has potential for cumulative effects. The Line Drop option has therefore been considered in the cumulative effects section of this assessment.

6.15.6 In accordance with relevant regulations and policies, the following effects have been scoped out of the assessment:

a. Construction and decommissioning impacts;

b. Impacts to workers;

c. Impacts to agriculture and natural ecosystems (such as entire habitats); and

d. Impacts on aviation receptors.

6.15.7 The ICNIRP 'reference levels' for the public are 100 microteslas for magnetic fields and 5,000 volts per metre for electric fields. These are the levels above

which more investigation is needed if this level of exposure is likely to occur; the permitted levels of exposure are somewhat higher, 360 microteslas and 9,000 volts per metre. They apply where the time of exposure is significant, for instance in a residence. As a worst-case the lower 'reference level' of 100 microteslas and 5,000 volts per metre is used in the assessment as the threshold at which potentially significant effects could occur.

6.15.8 For 400 kV cables buried at 0.9 meters, the magnetic field levels are well within safe limits, even at the highest recorded levels. For context, everyday household appliances like vacuum cleaners and microwaves can produce much higher EMF levels than these underground cables.

6.15.9 The assessment considers that given there are no residential properties within 100m which is well above the 5m threshold where potential significant effects could occur, there will be **no significant EMF effects** from above or below ground cables on residential properties.

6.15.10 With regard PRoW users, public access will be limited within 30m of the Grid Connection Line Drop should this be the option that is selected for the final design. Some PRoW do cross over the Grid Connection Corridor, and may also pass over the On-Site Cables and Grid Connection Line Drop where they are routed within the Order limits, however even in these instances exposure would be brief and comparable to everyday household exposure and is therefore assessed as **insignificant**.

6.15.11 The assessment also assessed at potential EMF effects on migratory fish. While there is limited guidance regarding onshore infrastructure, National Policy Statement EN-3: Renewable Energy Infrastructure (November 2023) considers that the effects of EMF from subsea cabling can be mitigated to negligible through use of sheathing and burial below 1.5m in most instances. Therefore, considering that the Grid Connection Cables are sheathed, and the installation depth of the cables will be at least 5m below the watercourse bed it is assessed that there will not be any significant effects from EMF on migratory fish.

6.15.12 One project, the potential Grid Connection Line Drop option associated with the Scheme, has been identified as having the potential for cumulative effects in combination with the Scheme. This project would involve works to establish the cable sealing end compound and works within the cable sealing end compound to modify the tower and connect the Scheme's cables to the NETS. The timing of these works may coincide with the timing of the cable laying in the Grid Connection Corridor and therefore has potential for cumulative effects.

6.15.13 The assessment concluded that the maximum EMF produced by the Grid Connection Line Drop would be less than the relevant public exposure limits. Additionally, there are no residential properties within 100m or PRoW access within 30m of the Line Drop, therefore **no significant cumulative effects** to residents or PRoW users are predicted to occur.

6.15.14 It is expected that the EMF associated with other developments included within the cumulative developments shortlist would also have no significant effect on receptors. Therefore, **no significant effects** are expected due to EMFs.

6.16 Materials and Waste

6.16.1 This section discusses the expected waste streams from the Scheme and how they will be managed. The following definitions have been used throughout the assessment.

a. Materials are defined as physical resources that are used across the lifecycle of a development. Examples include key construction materials such as concrete, aggregate, asphalt and steel; and

b. Wastes are defined as including surplus spoil, scrap, recovered spills, unwanted surplus materials, packaging, office waste, wastewater, broken, worn-out, contaminated or otherwise spoiled plant, equipment, and materials.

6.16.2 To inform the assessment, the national and regional availability (consumption/sales) of key construction materials and recovery rates for key construction materials and other construction wastes relevant to the Scheme were reviewed.

6.16.3 All management of waste, during construction, operation and maintenance and decommissioning, will be in accordance with the relevant regulations. Waste will be transported by licensed waste carriers to waste management sites which hold the necessary regulatory authorisation and/or permits for those wastes consigned to them. These measures are set out in the **Framework CEMP [EN010152/APP/7.7**], **Framework OEMP [EN010152/APP/7.8]** and **Framework DEMP [EN010152/APP/7.9]**.

6.16.4 Construction materials required to construct the Scheme are unlikely to be required in large quantities, e.g. they will represent less than 1% (aggregates and steel, which is a slight effect) and between 1-5% (concrete, which is a slight effect) of regional or national construction material availability. Therefore, **no significant effects** are anticipated.

6.16.5 With the embedded mitigation measures in place, the overall quantities of construction waste are anticipated to be a very small percentage of non-hazardous and hazardous landfill capacity (<1%, a slight effect). At this stage, the potential for generation of some surplus excavated material cannot be ruled out, but the quantities involved would be **not significant** in the context of regional landfill capacity and would only be disposed of to landfill as a last resort.

6.16.6 It is concluded that **no significant effects** are expected during construction.

6.16.7 Materials required to operate the Scheme are unlikely to be required in large quantities and **no significant effects** are anticipated.

6.16.8 During operation, including maintenance activities, waste generation is expected to be negligible, since Solar PV Panels and other Scheme components do not generate any waste as part of the energy production process. However, it is expected that there will be requirement for periodic replacement of some of the solar farm elements. Waste generated by maintenance activities such as component replacement during the operational life of the Scheme will be managed in the same way as waste from the final decommissioning of the Scheme. Recycling of Solar PV Panels will be prioritised as set out within the **Framework OEMP**

[EN010152/APP/7.8]. Therefore, **no significant effects** are expected during the operation of the Scheme.

6.16.9 At the end of the Scheme's operational life, it will be decommissioned. Recycling will be prioritised as set out within the **Framework DEMP [EN010152/APP/7.9]**. Recycling routes are generally available for decommissioning materials at present, and it is likely that there will be even greater opportunities for recycling in the future, not least because the market will have expanded to meet demand as solar PV installations increase. A number of new investments in solar PV recycling have been announced and an 80% recovery rate is reported. The overall quantities of decommissioning waste are anticipated to be a very small percentage of non-hazardous and hazardous landfill capacity (<1% a slight effect). **No significant effects** are expected during the decommissioning of the Scheme.

6.17 Cumulative Effects and Interactions

6.17.1 Cumulative effects have the potential to occur where two (or more) proposed schemes are within close enough proximity for them to both have environmental effects on the same receptor. This has been considered in each of the technical assessments.

6.17.2 The potential for cumulative effects and interactions as a result of the Scheme are summarised in **ES Volume I Chapter 15: Cumulative Effects and Interactions [EN010152/APP/6.1].**

6.17.3 The assessment of cumulative effects arising from the Scheme in combination with other proposed schemes is based upon a review of current submitted planning and DCO applications as well as a study of planning policy documents.

6.17.4 A list of proposed schemes that overlap the Order limits or are located close enough to the Scheme that they have the potential to generate significant cumulative effects have been identified. The list of proposed schemes has been shared with City of Doncaster Council and neighbouring authorities: North Yorkshire Council and East Riding of Yorkshire Council.

6.17.5 An assessment of the cumulative effects of the Scheme along with these other developments is presented in each technical chapter (**ES Volume I Chapters 6 to 14 [EN010152/APP/6.1]**). Within the majority of technical chapters, no likely significant effects have been identified through the cumulative effects assessment where they were not already predicted for the Scheme in isolation. Nor are any significant effects associated with the Scheme made greater (e.g. Moderate to Major) when considering these other developments alongside the Scheme. Therefore, it is considered that there will not be any new likely significant effects associated with cumulative effects that are not already accounted for by the assessment of the Scheme.

6.17.6 An exception is the additional erosion of the functional and historical setting of two Grade II listed buildings at Riddings Farm when the Scheme is considered alongside the consented demolition of the associated Grade II listed 'Lily Hall' farmhouse (22/01536/FUL and 22/01537/LBC). As presented in **ES Volume I Chapter 7: Cultural Heritage [EN010152/APP/6.1],** no suitable mitigation has been identified to reduce these to a non-significant

level and, therefore, the cumulative impact on these heritage assets is moderate adverse and significant.

6.17.7 Effect interactions are the combined effect of individual impacts from the Scheme that are considered likely to result in a new or different likely significant effect, or an effect of greater significance, than any one of the impacts on their own. The assessment draws on the assessment of impacts provided in **ES Volume I Chapters 6 to 14 [EN010152/APP/6.1]**.

6.17.8 Table 15-2 and Table 15-3 in **ES Volume I Chapter 15: Cumulative Effects and Interactions [EN010152/APP/6.1]** summarise the potential effect interactions. **No significant effect** interactions are anticipated as a result of the construction, operation and maintenance or decommissioning of the Scheme.

7. Summary and Conclusions

7.1.1 The ES explains the findings of the EIA process that has been undertaken for the Scheme. Feedback from the formal consultation process has been taken into account when preparing the DCO Application and in undertaking the EIA process.

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. These are secured through appropriate requirements and controls within the DCO Application.

7.1.3 Potential impacts to the setting of the scheduled medieval moated sites at Fenwick Hall and Thorpe in Balne (including the Grade II* listed chapel) are considered to result in significant residual effects. For Fenwick Hall, this is reversible upon decommissioning, and for Thorpe in Balne this is temporary during the construction phase. Potential physical impacts to known and potential buried archaeological remains located within the Order limits are considered to result in significant effects, however with the implementation of further embedded or additional mitigation, it is not considered that there would be any significant residual effects.

7.1.4 A significant cumulative effect has been identified upon two Grade II listed buildings at Riddings Farm comprising the Barn and granary (at Riddings Farm) immediately to northwest of Lily Hall, and the Dovecote and attached outbuilding on west side of farmyard at Riddings Farm. This moderate adverse cumulative effect is due to the consented demolition of the associated Grade II listed 'Lily Hall' farmhouse and the resultant additional erosion of the functional and historical setting of the farmstead’s buildings in combination with the effects of the Scheme. No suitable mitigation has been identified to reduce the significant cumulative effect to a non-significant level and so a significant residual cumulative effect remains on the two listed farmstead buildings.

7.1.5 During the construction and decommissioning of the Scheme, there is the potential for significant adverse residual effects on several visual receptors. Although significant, most of these impacts will be temporary, due to the transient nature of the construction works.

7.1.6 The operational Scheme is predicted to have some significant adverse landscape and visual amenity effects during Year 1 of operation, without the benefit of additional planting that is proposed as part of the embedded mitigation. In year 15 only LLCA 02, Jet Hall Farm, PRoW 10, 11, 12, 13, 14, 15, 16, Moss 5, and Sykehouse 29 are predicted to remain significant. While these are long term effects, they are reversible upon the completion of decommissioning.

7.1.7 In terms of transport and access, the assessment of effects concludes that following implementation of the embedded mitigation, impacts would be not

significant, except at the following links which are predicted to experience significant effects during construction (and decommissioning) of the Scheme:

a. Link 9: Moss Road – Askern Village;
b. Link 10: Moss Road – East of Askern;
c. Link 11: Fenwick Common Lane
d. Link 12: Trumfleet Lane – South of Moss
e. Link 13: Marsh Road; and
f. Link 14: Thorpe Bank.

7.1.8 The actual increase in traffic levels at these links due to the Scheme is small. However, as these routes currently experience low baseline traffic numbers, these represent high percentage increases and result in significant effects being assessed.

7.1.9 A **Transport Assessment** (**ES Volume III Appendix 13-4 [EN010152/APP/6.3])** and **Framework CTMP [EN010152/APP/7.17]** have been developed as part of the DCO Application, providing further details on the proposals to reduce any potentially significant likely effects identified in this chapter.

7.1.10 The Applicant is committed to achieving a minimum 10% BNG for all three metrics of biodiversity net gain (habitat units, hedgerow units and watercourse units) and the Scheme is predicted to result in a net gain of over 36% for habitat units, 62.75% for hedgerow units, and 24.97% for watercourse units based on the current design (see the **BNG Assessment [EN010152/APP/7.11]**). Overall, the Scheme is considered to deliver a **substantial beneficial** effect for biodiversity in the medium- to long-term.

7.2 Figures

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East Riding of Yorkshire Council

North Yorkshire Council

City of Doncaster Council

N

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LEGEND

- Order limits
- Land not included in the Order limits
- Local Authority Boundary

NOTES

ISSUE PURPOSE

Non-Technical Summary

PROJECT NUMBER

60698207

FIGURE TITLE

Scheme Location

1:40,000 @ A3

0.5 0.25 0 0.5 1 1.5 2 2.5 km

FIGURE NUMBER

Figure 1

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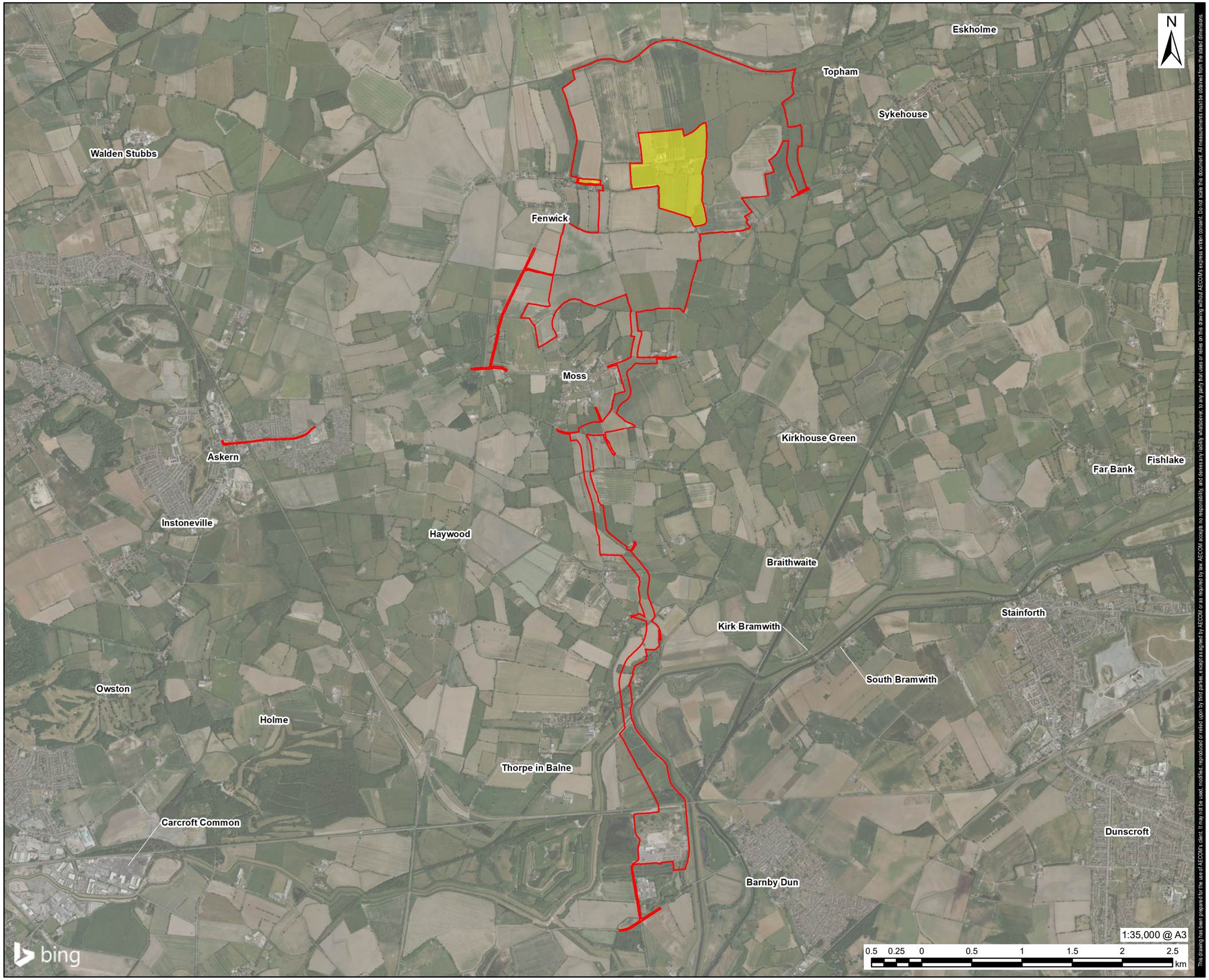

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LEGEND

- Order limits
- Land not included in the Order limits

NOTES

ISSUE PURPOSE

Non-Technical Summary

PROJECT NUMBER

60698207

FIGURE TITLE

Site Boundary Plan

FIGURE NUMBER

Figure 2

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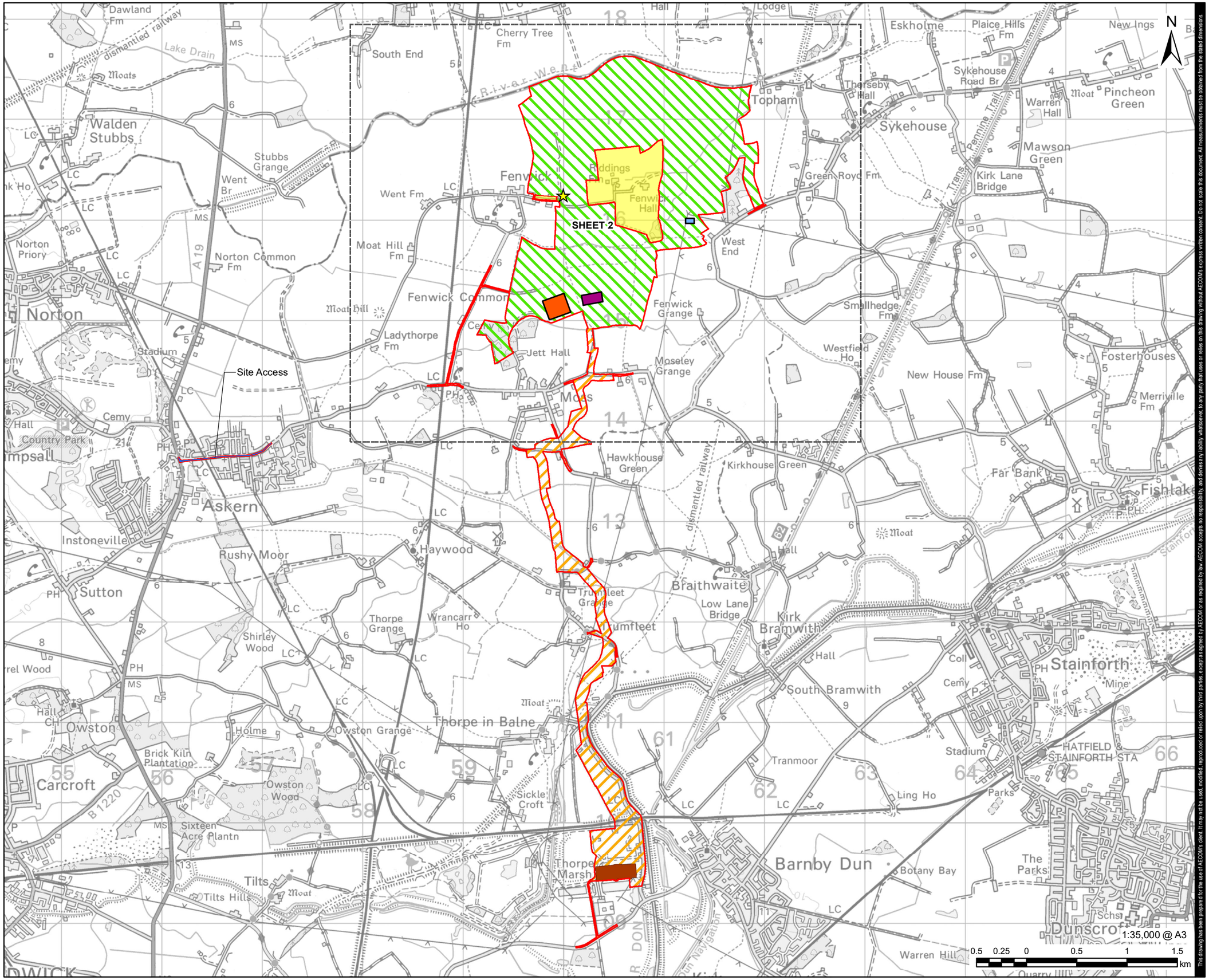

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LEGEND

- Order limits
- Land not included in the Order limits
- Location of Operations and Maintenance Hub
- Solar PV Site
- Grid Connection Corridor
- Site Access
- BESS Area
- On-Site Substation
- Grid Connection Line Drop Compound
- Existing National Grid Thorpe Marsh Substation

NOTES

ISSUE PURPOSE

Non-Technical Summary

PROJECT NUMBER

60698207

FIGURE TITLE

Elements of the Site: Site Boundary
Sheet 1 of 2

FIGURE NUMBER

Figure 3

1:35,000 @ A3

0.5 0.25 0 0.5 1 1.5 km

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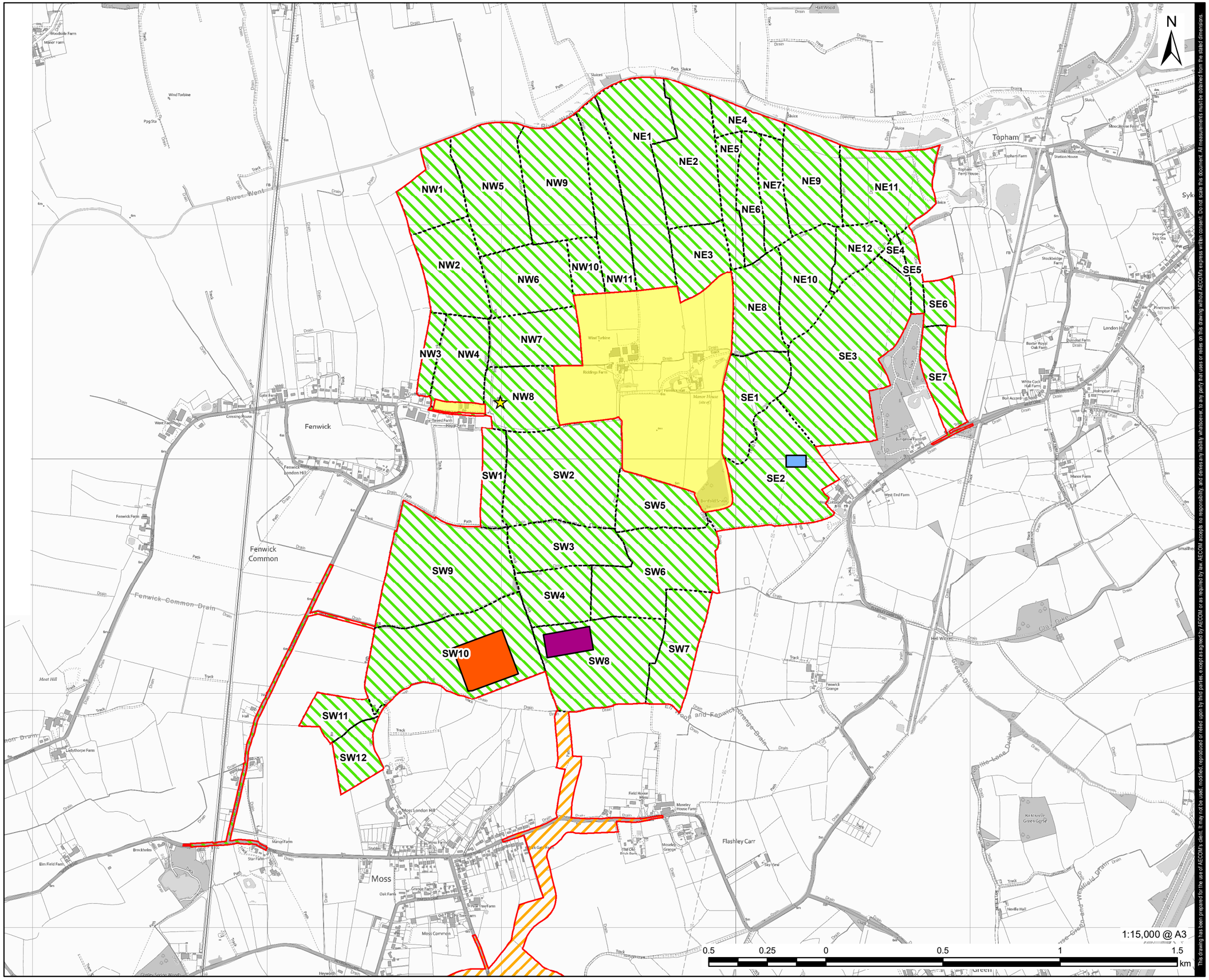

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LEGEND

- Order limits
- Land not included in the Order limits
- Location of Operations and Maintenance Hub
- Field Boundary
- Solar PV Site
- Grid Connection Corridor
- BESS Area
- On-Site Substation
- Grid Connection Line Drop Compound

NOTES

ISSUE PURPOSE

Non-Technical Summary

PROJECT NUMBER

60698207

FIGURE TITLE

Elements of the Site: Solar PV Site
Sheet 2 of 2

FIGURE NUMBER

Figure 3

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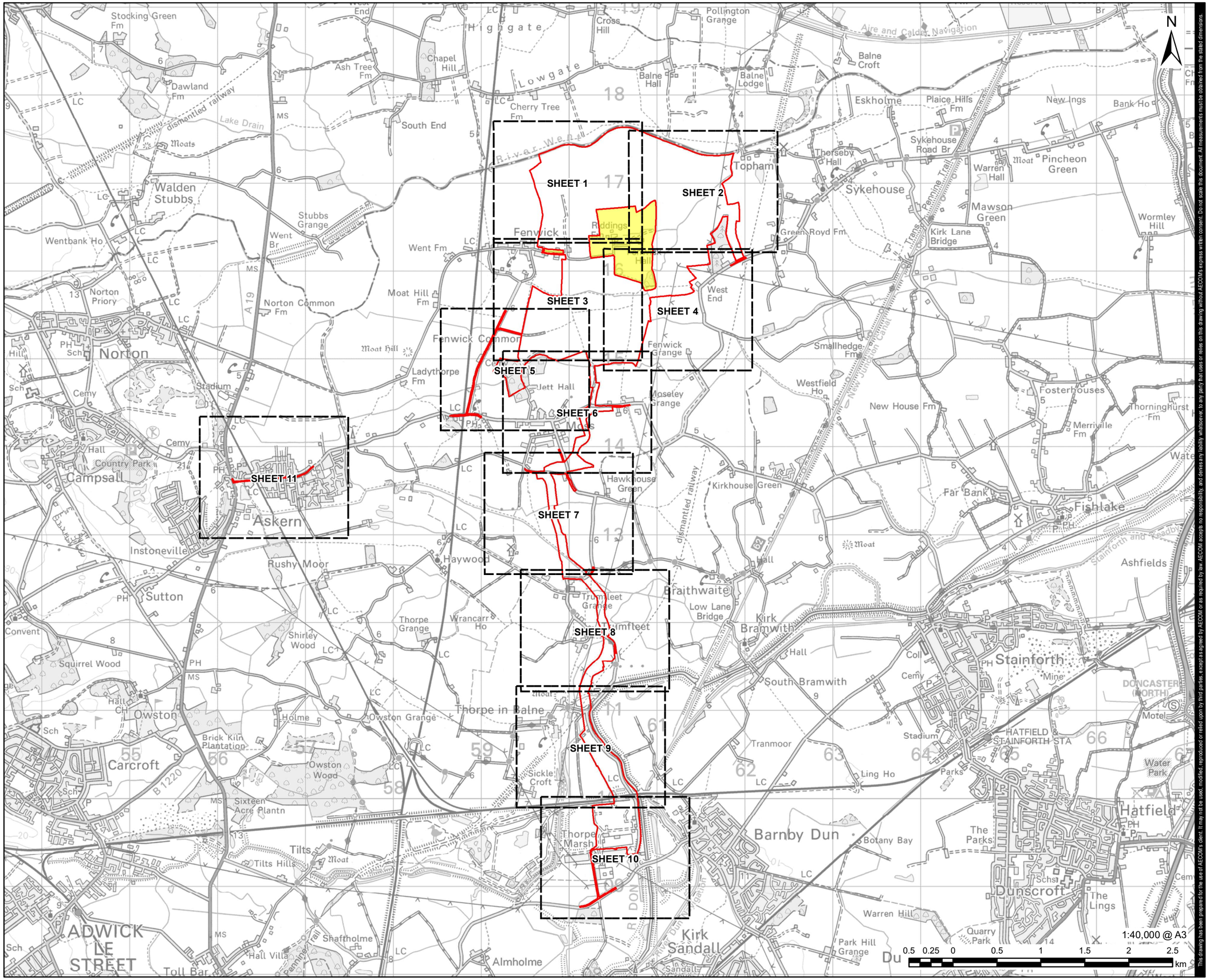

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LEGEND

- Order limits
- Land not included in the Order limits

NOTES

ISSUE PURPOSE

Non-Technical Summary

PROJECT NUMBER

60698207

FIGURE TITLE

Indicative Site Layout Overview Sheet

FIGURE NUMBER

Figure 4

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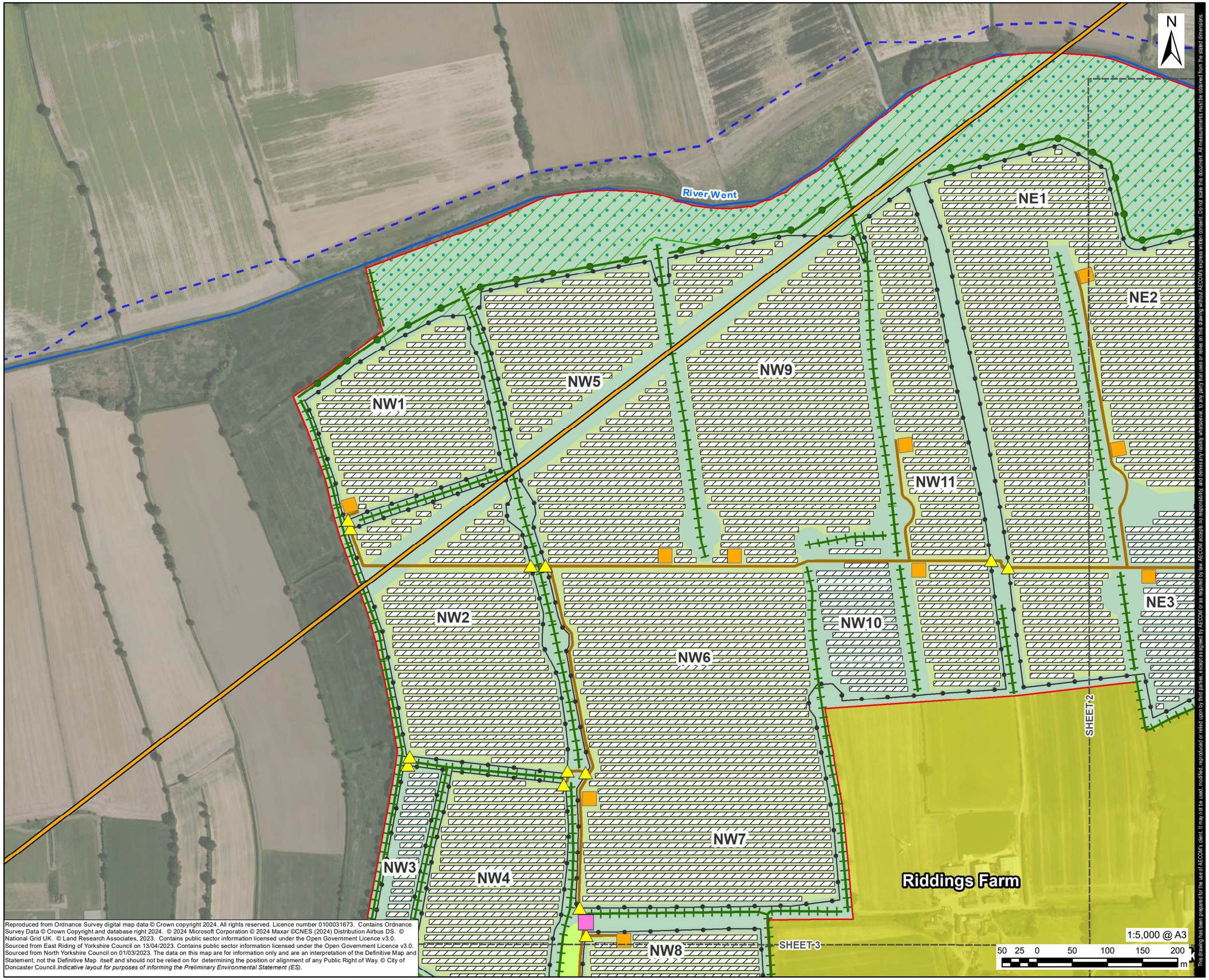

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LEGEND

- Order limits
- Land not included in the Order limits
- Existing Public Right of Way
- Watercourse
- High Pressure Fuel Pipeline
- Solar PV Panels
- Field Station
- Internal Access Track
- Perimeter Fencing
- Access Gate
- Bridge Option
- Ecology Mitigation Area
- Proposed Native Hedgerow / Vegetated Boundary
- Proposed Gapping Up of Existing Hedgerows / Hedgerows with Trees
- Proposed Riparian Edge Hedgerow and Trees
- Conservation and Enhancement of the Existing Open Riparian Mosaic, Including the Creation of Some Wet Grassland
- Proposed Native Scrub
- Proposed Neutral Grassland (Good Condition)
- Proposed Neutral Grassland (Moderate Condition)
- Proposed Modified Grassland

ISSUE PURPOSE

Non-Technical Summary

PROJECT NUMBER

60698207

FIGURE TITLE

Indicative Site Layout
Sheet 1 of 11

FIGURE NUMBER

Figure 4

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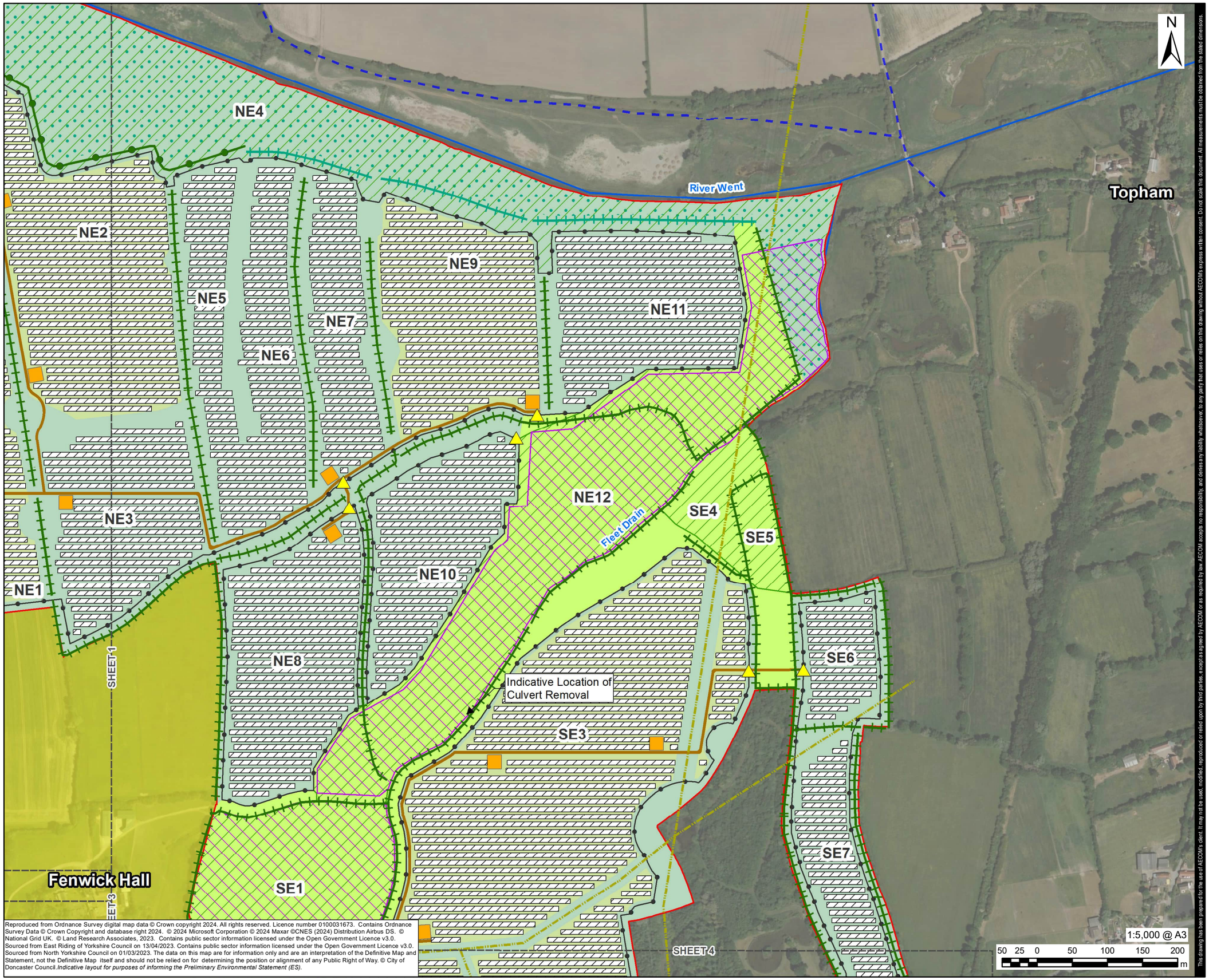

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LEGEND

- Order limits
- Land not included in the Order limits
- Existing Public Right of Way
- Watercourse
- Existing Overhead Line (OHL)
- Solar PV Panels
- Field Station
- Internal Access Track
- Perimeter Fencing
- Access Gate
- Ecology Mitigation Area
- Heritage Buffer Area
- Proposed Gapping Up of Existing Hedgerows / Hedgerows with Trees
- Proposed Riparian Edge Hedgerow and Trees
- Proposed Gapping Up of Hedgerows / Hedgerows with Trees with Wet-Loving Species
- Conservation and Enhancement of the Existing Open Riparian Mosaic, Including the Creation of Some Wet Grassland
- Proposed Neutral Grassland (Good Condition)
- Proposed Neutral Grassland (Moderate Condition)
- Proposed Modified Grassland

ISSUE PURPOSE

Non-Technical Summary

PROJECT NUMBER

60698207

FIGURE TITLE

Indicative Site Layout
Sheet 2 of 11

FIGURE NUMBER

Figure 4

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NW3
NW4
NW8
SHEET 1
SHEET 2
SHEET 4
SHEET 5
SHEET 6
Access Point 12
Lawn Lane
Operations and Maintenance Hub
Access Point 13
Access Point 4
Haggs Lane
Fenwick
Shaw Lane
Fenwick Common Lane
Fenwick Common Drain
Bunfold Shaw Lane
SW1
SW2
SW3
SW4
SW5
SW6
SW7
SW8
SW9
SW10
N
1:5,000 @ A3
50 25 0 50 100 150 200 m

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LEGEND
- Order limits
- Land not included in the Order limits
- Existing Public Right of Way
- Proposed Permanent Public Right of Way Diversion
- Proposed Temporary Public Right of Way Diversion
- Watercourse
- Existing Overhead Line (OHL)
- Solar PV Panels
- Field Station
- Fire Hydrant
- Water Tank
- Internal Access Track
- BESS Fire Service Access Track
- On-Site Substation
- BESS Area
- BESS
- BESS Control
- Operations & Maintenance Hub
- Pallisade Fencing
- Perimeter Fencing
- Site Access
- Access Gate
- Bridge Option
- Fire Service Access
- Proposed Native Hedgerow / Vegetated Boundary
- Proposed Gapping Up of Existing Hedgerows / Hedgerows with Trees
- Proposed Native Scrub
- Proposed Neutral Grassland (Good Condition)
- Proposed Neutral Grassland (Moderate Condition)
- Proposed Modified Grassland

ISSUE PURPOSE
Non-Technical Summary

PROJECT NUMBER
60698207

FIGURE TITLE
Indicative Site Layout
Sheet 3 of 11

FIGURE NUMBER
Figure 4

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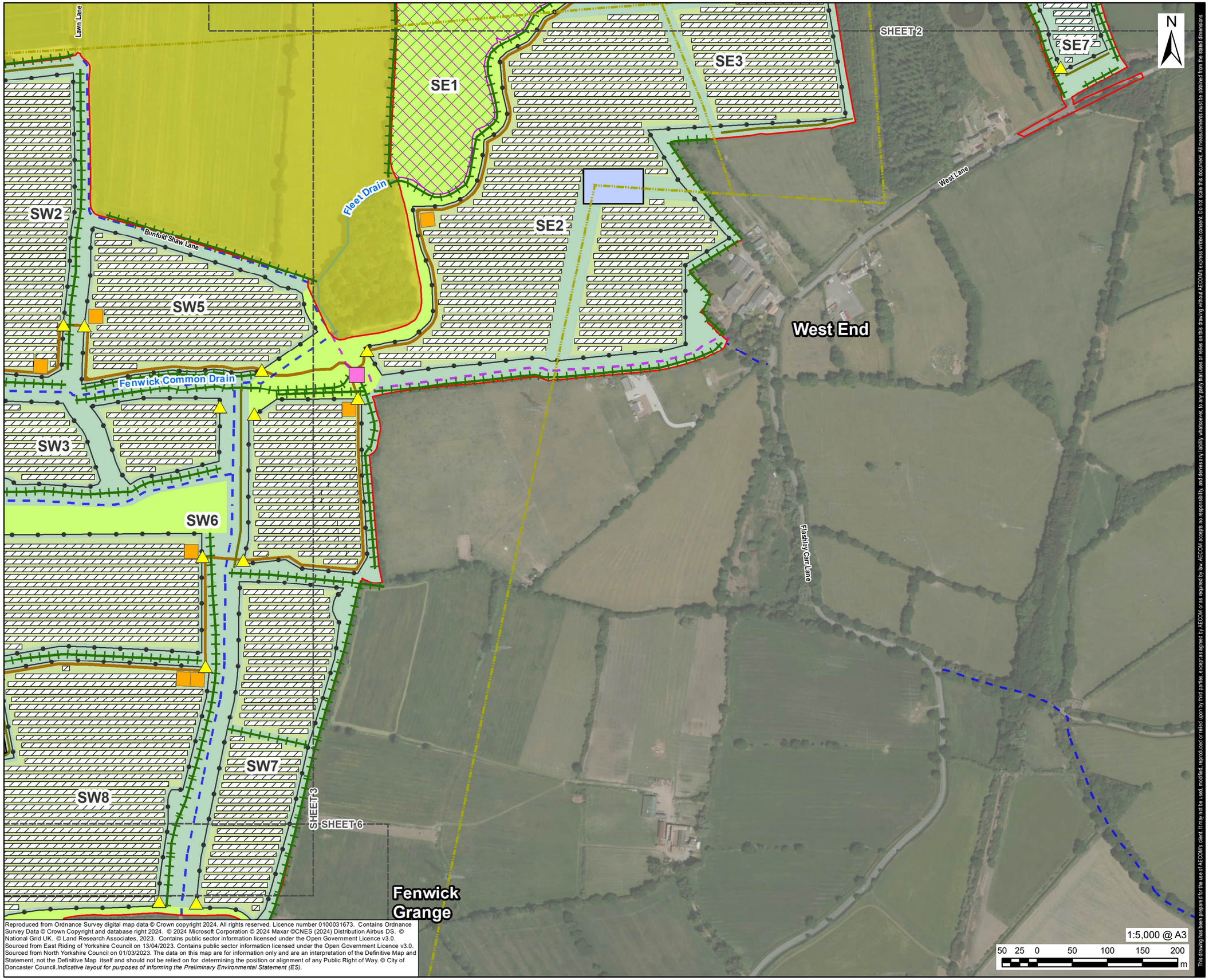

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LEGEND

- Order limits
- Land not included in the Order limits
- Existing Public Right of Way
- Proposed Permanent Public Right of Way Diversion
- Watercourse
- Existing Overhead Line (OHL)
- Solar PV Panels
- Field Station
- Internal Access Track
- On-Site Substation
- Grid Connection Line Drop Compound
- Pallisade Fencing
- Perimeter Fencing
- Access Gate
- Bridge Option
- Ecology Mitigation Area
- Heritage Buffer Area
- Proposed Native Hedgerow / Vegetated Boundary
- Proposed Gapping Up of Existing Hedgerows / Hedgerows with Trees
- Proposed Neutral Grassland (Good Condition)
- Proposed Neutral Grassland (Moderate Condition)
- Proposed Modified Grassland

ISSUE PURPOSE

Non-Technical Summary

PROJECT NUMBER

60698207

FIGURE TITLE

Indicative Site Layout
Sheet 4 of 11

FIGURE NUMBER

Figure 4

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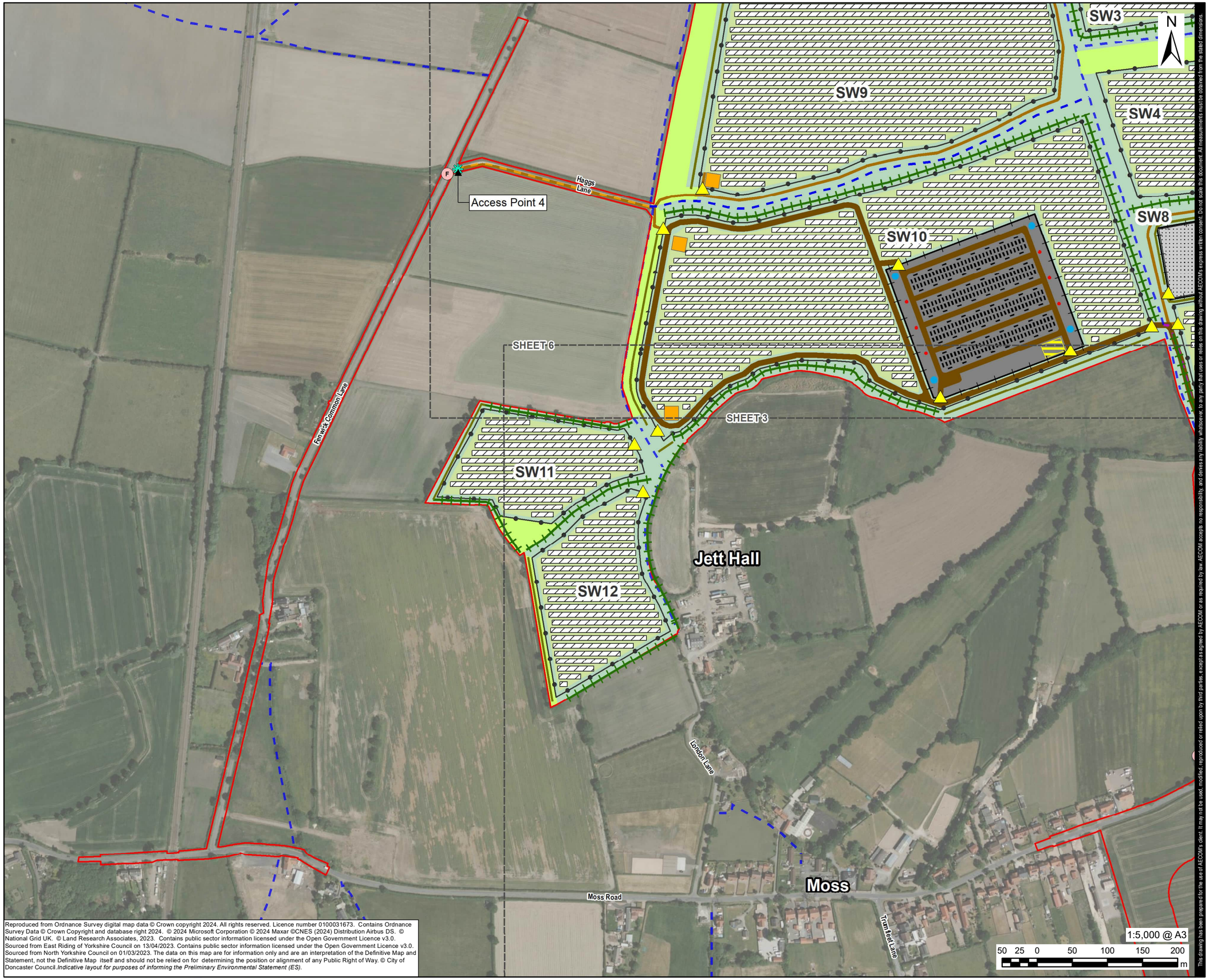

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LEGEND

- Order limits
- Existing Public Right of Way
- Proposed Permanent Public Right of Way Diversion
- Proposed Temporary Public Right of Way Diversion
- Solar PV Panels
- Field Station
- Fire Hydrant
- Water Tank
- Internal Access Track
- BESS Fire Service Access Track
- On-Site Substation
- BESS Area
- BESS
- BESS Control
- Pallisade Fencing
- Perimeter Fencing
- Site Access
- Access Gate
- Fire Service Access (F)
- HGV Access (H)
- Proposed Native Hedgerow / Vegetated Boundary
- Proposed Gapping Up of Existing Hedgerows / Hedgerows with Trees
- Proposed Native Scrub
- Proposed Neutral Grassland (Good Condition)
- Proposed Neutral Grassland (Moderate Condition)
- Proposed Modified Grassland

ISSUE PURPOSE

Non-Technical Summary

PROJECT NUMBER

60698207

FIGURE TITLE

Indicative Site Layout
Sheet 5 of 11

FIGURE NUMBER

Figure 4

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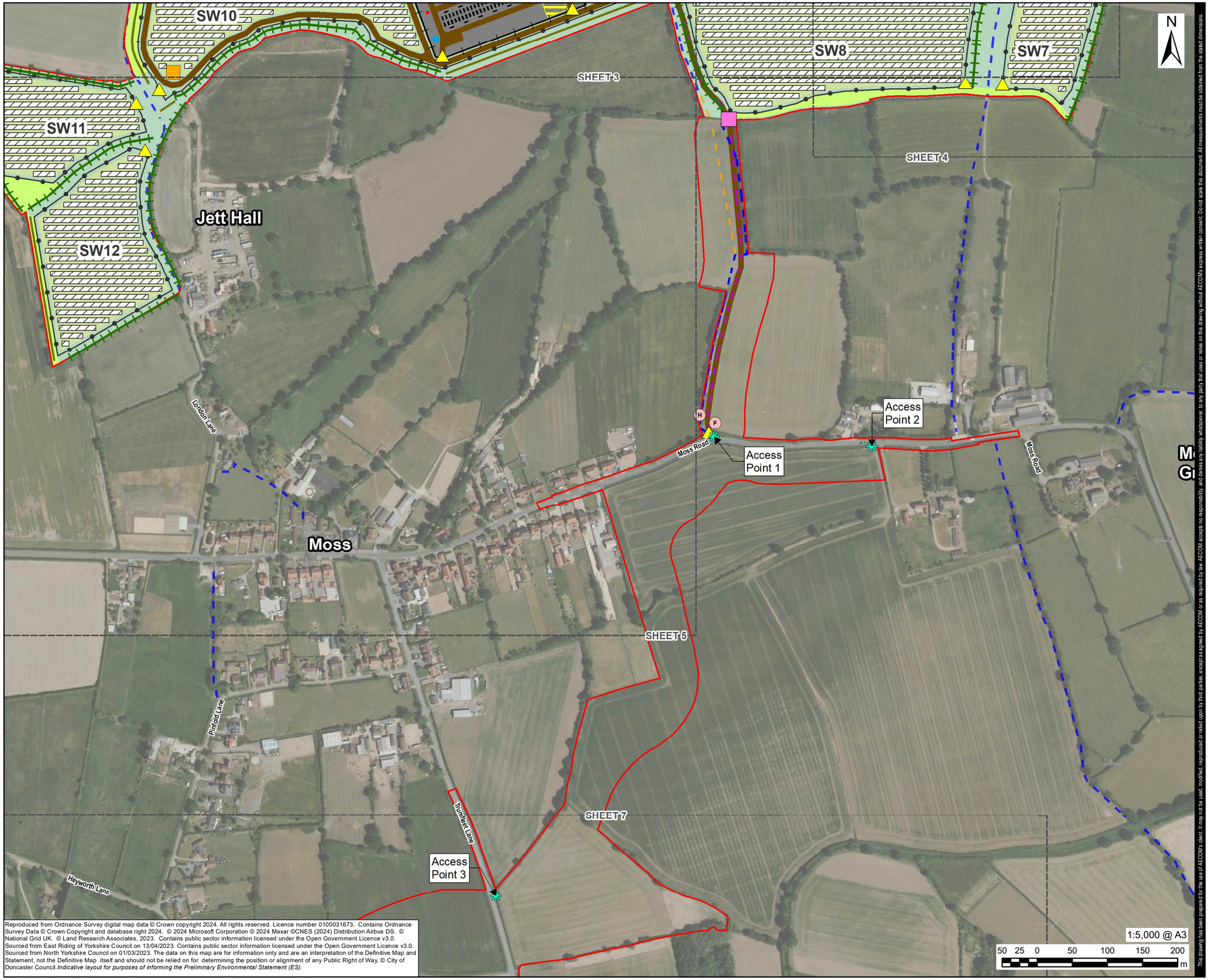

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LEGEND

- Order limits
- Existing Public Right of Way
- Proposed Permanent Public Right of Way Diversion
- Proposed Temporary Public Right of Way Diversion
- Solar PV Panels
- Field Station
- Fire Hydrant
- Water Tank
- BESS Fire Service Access Track
- BESS Area
- BESS
- BESS Control
- Pallisade Fencing
- Perimeter Fencing
- Site Access
- Access Gate
- Bridge Option
- Fire Service Access (F)
- HGV Access (H)
- Proposed Native Hedgerow / Vegetated Boundary
- Proposed Gapping Up of Existing Hedgerows / Hedgerows with Trees
- Proposed Neutral Grassland (Good Condition)
- Proposed Neutral Grassland (Moderate Condition)
- Proposed Modified Grassland

ISSUE PURPOSE

Non-Technical Summary

PROJECT NUMBER

60698207

FIGURE TITLE

Indicative Site Layout
Sheet 6 of 11

FIGURE NUMBER

Figure 4

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LEGEND

- Order limits
- Existing Public Right of Way
- Site Access

ISSUE PURPOSE

Non-Technical Summary

PROJECT NUMBER

60698207

FIGURE TITLE

Indicative Site Layout
Sheet 7 of 11

FIGURE NUMBER

Figure 4

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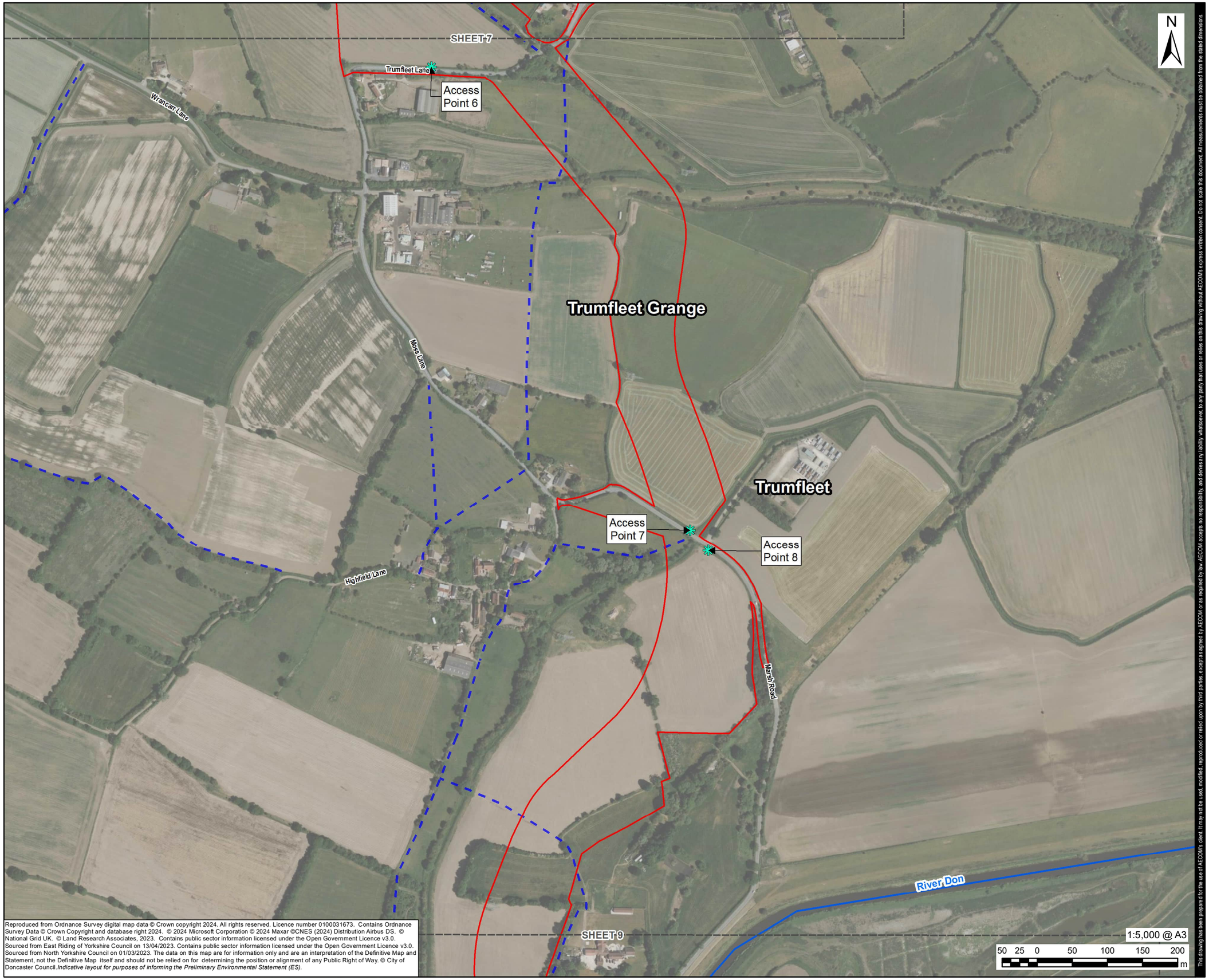

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LEGEND

- Order limits
- Existing Public Right of Way
- Watercourse
- Site Access

ISSUE PURPOSE

Non-Technical Summary

PROJECT NUMBER

60698207

FIGURE TITLE

Indicative Site Layout
Sheet 8 of 11

FIGURE NUMBER

Figure 4

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SHEET 8

SHEET 10

Marsh Road

Thorpe Lane

Thorpe Bank

Ash Field Road

Circuit Lane

River Don

River Dun Navigation

Access Point 9

N

1:5,000 @ A3

50 25 0 50 100 150 200 m

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LEGEND

- Order limits
- Existing Public Right of Way
- Watercourse
- Site Access

ISSUE PURPOSE

Non-Technical Summary

PROJECT NUMBER

60698207

FIGURE TITLE

Indicative Site Layout
Sheet 9 of 11

FIGURE NUMBER

Figure 4

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LEGEND

- Order limits
- Existing Public Right of Way
- Watercourse
- Site Access

ISSUE PURPOSE

Non-Technical Summary

PROJECT NUMBER

60698207

FIGURE TITLE

Indicative Site Layout
Sheet 10 of 11

FIGURE NUMBER

Figure 4

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LEGEND

Order limits

Existing Public Right of Way

ISSUE PURPOSE

Non-Technical Summary

PROJECT NUMBER

60698207

FIGURE TITLE

Indicative Site Layout
Sheet 11 of 11

FIGURE NUMBER

Figure 4

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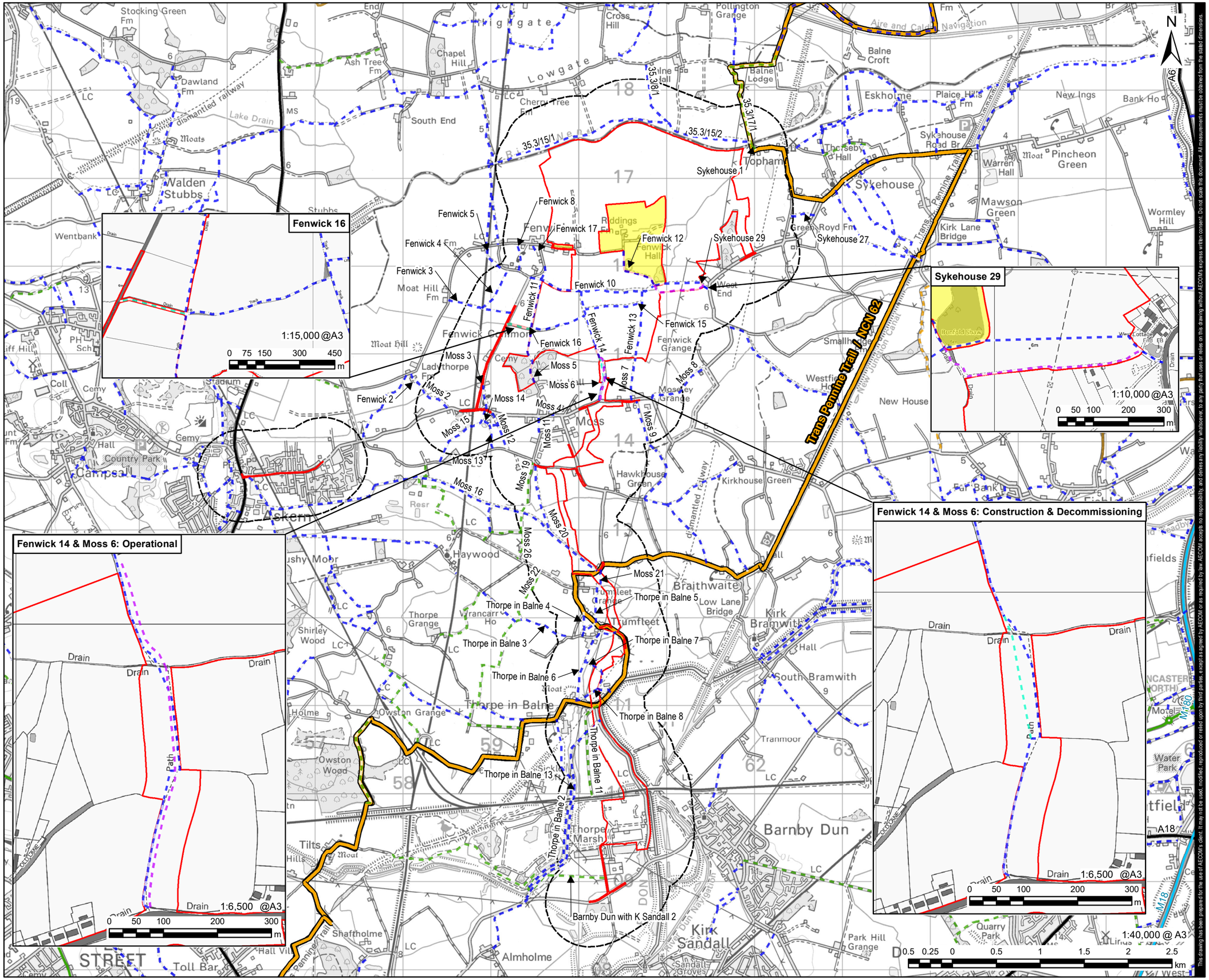

PROJECT

Fenwick Solar Farm

CLIENT

Fenwick Solar Project Limited

CONSULTANT

AECOM Limited
Midpoint,
Alencon Link
Basingstoke, RG21 7PP
www.aecom.com

LEGEND

- Order limits
- Land not included in the Order limits
- 500m Buffer of the Order limits
- A Road
- B Road
- Motorway
- Trans Pennine Trail & National Cycle Network (NCN) Route 62

Public Right of Way

- Bridleway
- Byway Open to All Traffic
- Footpath
- Proposed Permanent Public Right of Way Diversion
- Proposed Temporary Public Right of Way Diversion
- Restricted Byway

NOTES

ISSUE PURPOSE

Non-Technical Summary

PROJECT NUMBER

60698207

FIGURE TITLE

Public Rights of Way

FIGURE NUMBER

Figure 5

Revision: 0 Drawn: LP Checked: JW Approved: MR Date: 2024-10-24

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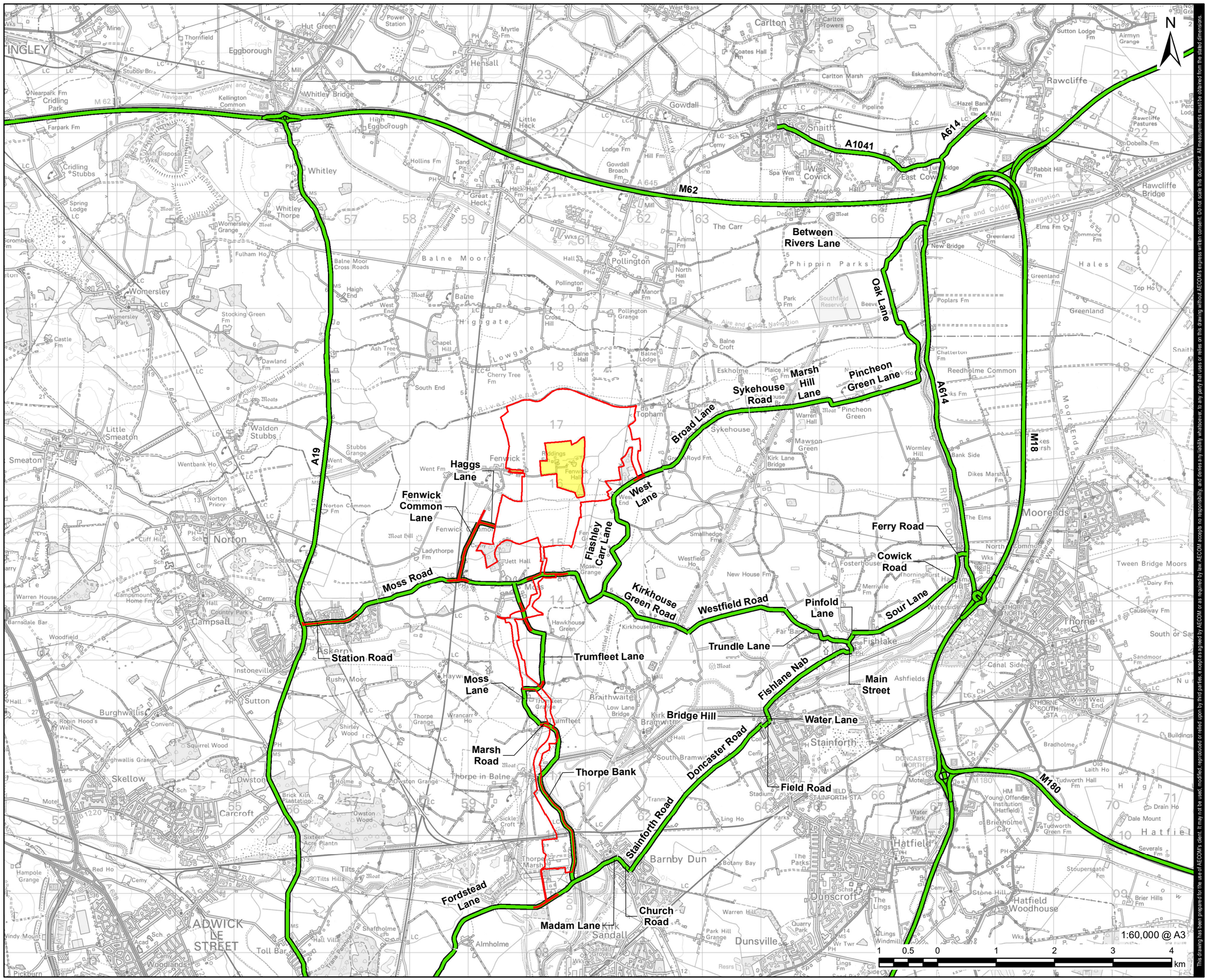

AECOM

PROJECT

Fenwick Solar Farm

CLIENT

Fenwick Solar Project Limited

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LEGEND

- Order limits
- Land not included in the Order limits
- Study Area Road Network

NOTES

ISSUE PURPOSE

Non-Technical Statement

PROJECT NUMBER

60698207

FIGURE TITLE

Study Area Road Network

FIGURE NUMBER

Figure 6

Revision: 0 Drawn: LP Checked: JW Approved: AP Date: 2024-10-24

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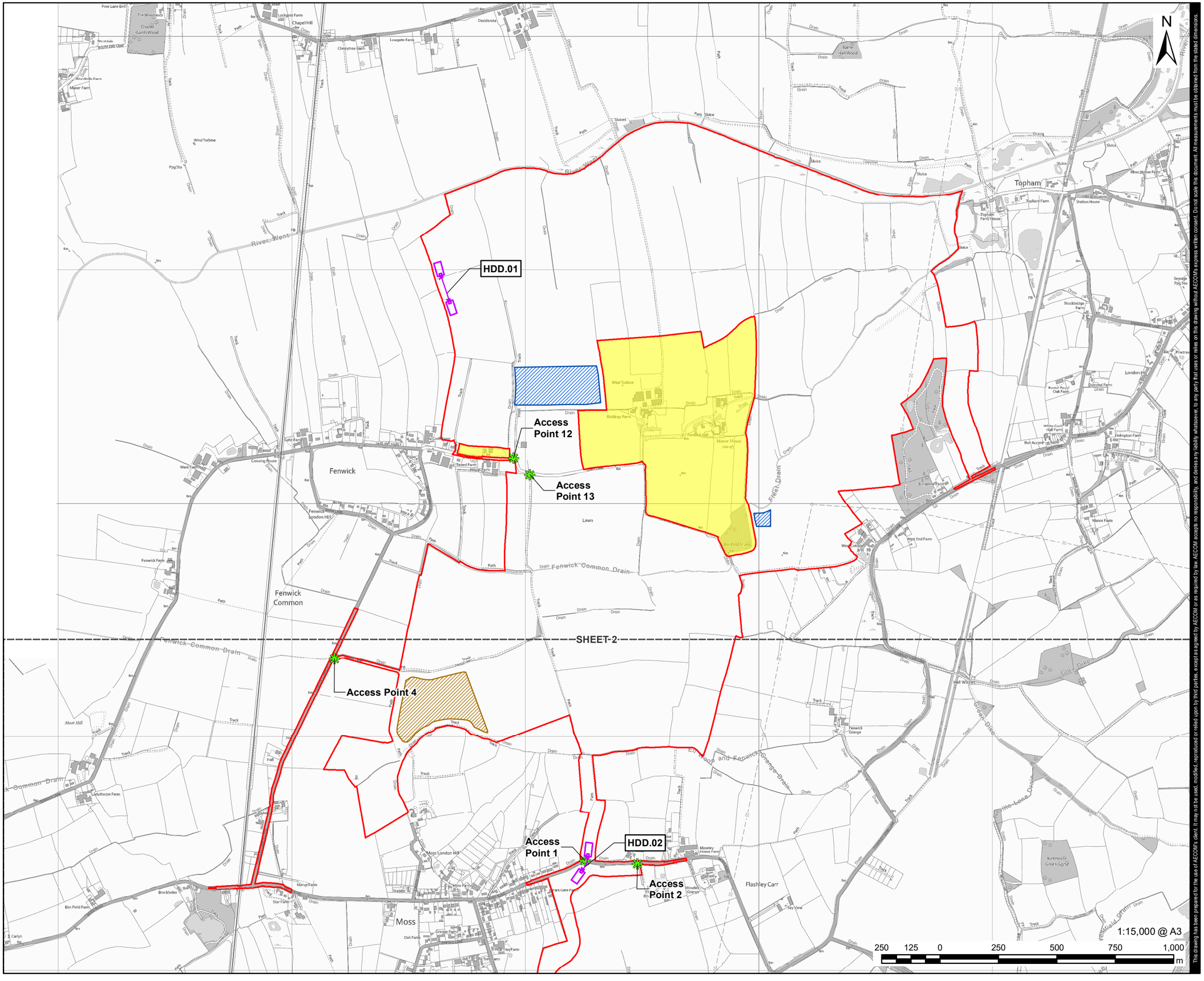

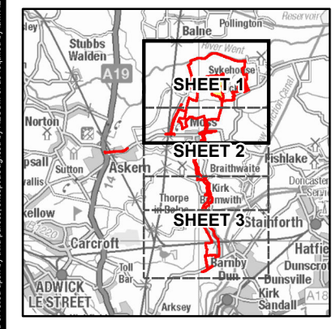

AECOM

PROJECT

Fenwick Solar Farm

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LEGEND

- Order limits
- Land not included in the Order limits
- Site Access
- Indicative HDD Area
- Main Construction Compound
- Indicative Temporary Construction Compound

NOTES

ISSUE PURPOSE

Non-Technical Summary

PROJECT NUMBER

60698207

FIGURE TITLE

Location of Temporary Construction Compounds and Indicative HDD Areas Sheet 1 of 3

FIGURE NUMBER

Figure 7


BOOM
POWER
BUILD | OWN | OPERATE | MAINTAIN
BOOM-POWER.CO.UK